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POSTER PRESENTATIONS

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Poster Presentations

EP-0001 [Neurovascular Surgery » Basic Science]

Cerebral Vasospasm Post-Subarachnoid Hemorrhage – Pathophysiological Bases for Its Treatment

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The first part lines up the most remarkable and recent experimental studies that have contributed to advances in understanding the pathophysiological mechanisms leading to cerebral vasospasm. Different ways where and how the oxyhemoglobin produces damage to the arterial wall of arteries: Lipid peroxidation to the cell membranes of the different layers of arterial wall through free radical reactions. Endothelial “dysfunction” and damage with detachment and secondary increased platelet aggregation, increased production of platelet derived growing factors, prostaglandins, endothelin, decreased action of nitric oxide, and as a consequence of all this pathophysiological cascade, activation of myofibroblasts and subendothelial compactation with ultrastructural arterial wall damage that produces narrowing of the arterial lumen, at the branches of Willis circle. Also, is presented the most recent hypothesis, such the remarkable signs of inflammatory reaction inside the wall of the great arteries of the cerebral base. These are ultrastructural alterations of the arterial wall, and not a real spasm. The second part deals with the attempts of prevention and treatment, based on this pathophysiological knowledge. Prevention and treatment of the so called angiographic vasospasm or “narrowing” of the great arteries of the Willis circle at the base of the brain, and prevention and treatment of the consequence of this arterial “narrowing” at the brain tissue, the delayed ischemic deficit, due to a “real vasospasm” at the microcirculation.

The most accepted medical treatments are reviewed.

Keywords: Cerebral vasospasm, Subarachnoid hemorrhage, Delayed ischemic deficit, Lipid peroxidation, Inflammatory pathology

EP-0002 [Neurovascular Surgery » Basic Science]

A Novel Chronic Cerebral Hypoperfusion Model with Gradual Cerebral Blood Flow Reduction, Angiogenesis and Cognitive Impairment in Rats

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Background: Bilateral stenosis/occlusion of common/internal carotid artery has been frequently used to mimic cognitive deficit of vascular dementia (VD). However, in these models, the cerebral blood flow (CBF) drops sharply after ligation of common carotid arteries (CCAs), which differs from ‘chronic’ cerebral hypoperfusion. Other modified techniques were applied by staged occlusion of both CCAs costing a longer procedure, and others used microcoils for CCA stenosis with hazardous effect on arterial endothelium. To overcome the problems described above, we developed a new model of chronic cerebral hypoperfusion (CCH) in rats.

Method: Male Sprague-Dawley rats were subjected to one side occlusion and contralateral side stenosis of CCA. Cortical regional CBF (rCBF) was measured using laser speckle flowmetry. The rats were assigned to CCH and sham operation groups. After 4 weeks, cognitive function was assessed and cervical/intracranial arteries as well as parenchymal injury were evaluated by MRI. Then rat brains were histologically evaluated.

Results: Gradual CBF reduction was observed in the CCH group. Cellular density decreased in the hippocampus as well as the cerebral cortex, whereas MRI revealed no cerebral infarctions. Immunohistochemistry demonstrated upregulated inflammatory cells and angiogenesis in the hippocampus and cerebral cortex. Spatial learning and memory impairment was significantly high in the CCH group.

Conclusion: We established a new model of chronic cerebral hypoperfusion in rats. The model is easy and reproducible, and may be useful to investigate VD and CCH as well as pathology of angiogenesis.

Keywords: Chronic cerebral hypoperfusion, Cerebral blood flow, Cognitive deficit, Angiogenesis

EP-0003 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Strategy and Technique of Brainstem Cavernous Hemangioma

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Background: The location of brainstem cavernous hemangioma is deep and the risk of surgery is very high. With the development of microneurosurgery technology, imaging, more and more brainstem cavernous hemangioma has been cured by microneurosurgery. In particular, with the development of endoscopic surgery, endoscopic endonasal transsphenoidal surgery can get satisfactory treatment outcome.

Method: We reviewed brainstem cavernous hemangiomas which were resected through craniotomy or endoscopic endonasal transsphenoidal surgery at Tangdu Hospital from 2011 to 2016. All cases underwent preoperative MRI and DTI imaging analysis. According to the tumor site and its relationship with conduction bundle, the surgical approach is established. For the cavernous hemangioma with its position is in the front of the brainstem and there is no relationship with conduction bundle, endoscopic endonasal transsphenoidal surgery is used. Drilling the slope bone and to the ventral of brainstem, under the guide of neuronavigation we select the safe site or the thinnest part to the tumor to remove tumor.

Results: All patients were followed up for 6-24 months. No remnants, recurrence and hemorrhage were observed by MRI. The clinical symptoms were improved obviously. There was no new neurological dysfunction and no death in patients.

Conclusion: Minimal invasive neurosurgery is an effective safe method to treat brainstem cavernous hemangioma. For selective cases, endoscopic endonasal transsphenoidal surgery has gradually become a trend, which provides a minimal invasive, safe and effective treatment for the lesion. Preoperative detailed imaging, neuronavigation and intraoperative electrophysiological monitoring and other auxiliary technology provide a reliable guarantee for the operation of surgery.

Keywords: Brainstem cavernous hemangioma, Nasal endoscope, Microneurosurgery

EP-0004 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Intracerebral Hematoma (ICH) Removal: Of Limited Benefit Compared to Classic

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Background: Surgical treatment of ICH remains a disputed issue in current neurosurgery and the results are not always satisfactory. The introduction of the endoscope can reduce the size of the corticotomy and thus might contribute to a better postoperative outcome. Is this the case?

Method: We have performed a retrospective study on ICH patients who were operated by the same group of surgeons with and without an endoscope. Group A consisted of 34 patients (Mean Age 63.4 yrs, 62% males) who were operated with classic removal of the clot. Group B consisted of 15 patients (Mean Age 65.1 yrs, 60% males) who were operated with endoscope-assisted removal.

Results: No difference was found in survival rates between the 2 groups. For Group A survival was 67% and Glasgow Outcome Score (GOS) was 3.14 while For Group B survival was 65% and GOS was 3.73.

Conclusion: The use of the endoscope does not alter survival rates and it increases the operative time by approximately 30 minutes. On the other hand it offers a definite statistically significant ($p < 0.01$) improvement at the GOS especially for a subgroup of patients with deeper seated basal ganglia lesions and may help identifying a "hidden" source of bleeding in some cases.

Keywords: Endoscopic, ICH, Comparison

EP-0005 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Management of Giant Basilar Tip Aneurysm Associated with Moyamoya Disease: A Case Report and Literature Review

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We report the efficacy and safety of surgical treatment with the orbitozygomatic transsylvian approach and the rarity of accompanying subarachnoid hemorrhage, Terson syndrome, and ruptured giant basilar tip aneurysm in a patient affected by moyamoya disease with a good outcome. A 40-year-old man with a history of exertional headache from childhood and hypertension diagnosed 5 years previously was referred to us with the presenting symptom of headache. After 1 day, he developed left hemiplegia, decreased level of consciousness, and blindness in the left eye. Imaging studies revealed a subarachnoid hemorrhage and giant basilar tip aneurysm. He underwent surgical clipping of the aneurysm using the orbitozygomatic transsylvian approach. With obvious improvement in strength and consciousness, the patient was discharged. Early diagnosis and treatment of the other possible complications of moyamoya disease were recommended. The rarity and different manifestations of moyamoya disease require individualized decision making with regard to cerebrovascular complications. Individualized decision making and the cooperation of medical teams are the mainstays of treatment.

Keywords: Giant aneurysm, Moyamoya disease, Subarachnoid hemorrhage

EP-0006 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Keyhole vs Pterional Approach for Clipping Ruptured Anterior Circulation Aneurysms

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Background: Keyhole surgery is minimally invasive alternative to pterional approach for clipping ruptured anterior circulation aneurysms, with studies often being contentious due to fallacious comparisons between surgeons of diverse experience. This is a controlled study of the initial 25 cases of keyhole clipping with preceding 25 matched pterional cases by the same surgeon.

Method: Patients with ruptured saccular aneurysms at communicating segment of internal carotid artery, anterior communicating artery or middle cerebral artery, presenting with WFNS grade 1-3 and no midline shift, who were operated by the same surgeon, across his transition period from pterional to keyhole approach were studied. Appropriate statistical analyses were performed.

Results: The patients in both groups were comparable with respect to age, gender and location of aneurysms. Peri-operative lumbar drainage was performed in all patients of keyhole group (4 failed) and ventricular puncture utilized in 4 patients of pterional group (1 failed). Elective temporary clipping was performed in all keyhole cases and 20 of the pterional group. No patient in either group had any immediate post-operative deficits or residual aneurysm in repeat imaging. There was no significant difference in transient and persistent delayed cerebral ischemia (16% & 8% in pterional group, compared with 12% & 4% in keyhole group respectively). Temporal hollowing (12% vs 0%) and chewing difficulty (28% vs 0%) were significantly greater in the pterional compared to keyhole group ($p < 0.05$).

Conclusion: Keyhole approach seems to have equivalent efficacy but better post-operative cosmesis and mastication than pterional craniotomy for clipping ruptured anterior circulation aneurysms.

Keywords: Keyhole, Pterional, Clipping, Minimally invasive, Cosmesis, Chewing

EP-0007 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

An Intracranial Arteriovenous Fistula with a Large Pial Venous Varix in a Young Male

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Pial arteriovenous fistula (PAVF) is a rare vascular condition comprising of one or more arterial vessels that are in direct communication with the draining veins. The condition is also characterized by the absence of a nidus. Due to high blood flows, varicose systems adjacent to the fistula appear. The patient is 28-year-old child with a lesion in the right frontotemporal lobe, fed by a branch of the right middle cerebral artery, which drains into the Trolard vein and was associated with large a venous varix. The patient was presented with seizure. Patient underwent surgery with microsurgical approach and feeding artery clipping with titanium clip and patient successfully treated. PAVF is a disease characterized by its rarity, and knowledge of PAVF's clinical presentation is of vital importance in early diagnosis. The treatment of the condition consists of an occlusion of the supply vessel, which can be done by endovascular, microsurgical, or both procedure

Keywords: Arteriovenous fistula, Piameter, Intracranial

EP-0008 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Purely Endoscopic Resection of Cavernoma on the Floor of Third Ventricle and Aqueduct of Sylvius: Surgical Technique and Review of Literature

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Intraventricular cavernous malformations are unusual intracranial vascular malformations and their deep anatomical location complicates its surgical management. We report an intraventricular cavernous malformation located on the floor of third ventricle and the aqueduct of Sylvius; which was totally resected by endoscopic means. A 51-year-old patient presented with an intraventricular cavernous malformation located on the floor of third ventricle and the aqueduct of Sylvius. Site of the burr hole and the trajectory was planned using preoperative MRI measurements. A 30° 6 mm ventricular endoscope (DECQ neuroendoscope, Karl Storz) was used. The third ventriculostomy was performed. In posterior TV exploration, a subacute hemorrhagic lesion was observed. Sharp dissection and bipolar cautery was used to mobilize the lesion from the TV margins. Grasping forceps were used to dissect away the lesion from the borders of the aqueduct and TV. The clot and the cavernoma were removed in multiple pieces through the cerebral endoscopic path. Finally, endoscopic inspection revealed no residual lesion. Immediately after surgery the patient was awake and ocular movements improved. The patient was discharged in his fifth postoperative day. One year after the surgery the patient was asymptomatic. Neuropathology reported a cavernous malformation. Microsurgical approaches have been considered the gold standard for the management of intraventricular lesions during last decades. However, improvements of neuroendoscopic image quality, surgical techniques and instruments have increased effectiveness and safeness during endoscopic procedures, gaining acceptance among neurosurgeons. To the best of our knowledge, this is the first endoscopic resection of a CM located at the posterior floor of the TV and aqueduct.

Keywords: Intraventricular, Cavernous malformation, Endoscopy, Third ventricle, Aqueduct of sylvius, Minimally invasive

EP-0009 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Intracranial Aneurysms: Acute vs Delayed Surgery, an Analysis of 145 Cases

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Aim: To determine the results of early and late surgery for aneurysmal subarachnoid haemorrhage. The aim of micro neurosurgical management of an aneurysm is the total occlusion of the aneurysm sac by clipping at the neck of aneurysm with preservation of flow in the parent artery and preservation of all its perforating arteries with minimal or no brain retraction.

Method: We did 145 cases of aneurysm surgery from July 2008 to December 2016.

Results: Most of the clipping (57.14%) were done in intermediate stage (4th to 10th days), because patients usually referred from peripheral hospital on 2nd or 3rd days after the acute S.A.H. Those who was admitted early and H&H status good, was fit to do early surgery (within 3rd day)(28.57%). Overall outcome was assessed at 3 months after SAH using the Glasgow Outcome Scale. Good outcome were observed in 104 cases(71.72%) among them 145 cases were able to return pre-morbid activities. Total mortality in this series were 17 cases (11.72 %) which includes preoperative death while waiting for clipping 5 cases and postoperative death 12 cases.

Conclusion: There is no reason to postpone clipping surgery in patients who are eligible for surgery at day 5. Surgery after day 10 is associated with worse outcome. Although these studies is having high rate of mortality which can be progressively minimize by our continuous improvement of surgical skills and postoperative critical care management of aneurysm patients.

Keywords: Aneurysm, Clipping, Craniotomy

EP-0010 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Endonasal Anterior Skull Base Surgery for the Removal of Space Occupying Lesions

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Endoscopic endonasal surgery is a minimally invasive technique used mainly in neurosurgery and otolaryngology. Using an endoscope through the nose and performing the complex and high skilled surgeries for removing the brain tumours and correcting various defects in the anterior skull base is a class of art requiring highly trained endoscopist and the modern equipment. Initial stages of surgery is performed through the nasal cavity and sphenoid bone followed by drilling into any cavities containing a neural organ such as the pituitary gland.

The objective of this study was to review the endoscopic anatomy of the anterior skull base, defining the pitfalls of endoscopic endonasal approaches to this region. As the approaches are gaining popularity we have adopted the recent advances and shared our experience of the extended approaches.

We approached sellar (pituitary), suprasellar (craniopharyngioma) and planum sphenoidale areas achieving very good results. The commonest complication that we encountered was CSF leak (25%) which was accordingly managed.

Our study presented that extended endoscopic endonasal approaches are sufficient in providing enough exposure of the bony structures along with the extradural and intradural components of the anterior skull base. In addition, the neighbouring structures are very well visualized providing more controlled manipulation of pathologic lesions. These approaches require great skill and learning

curve to achieve more minimally invasive interventions and less postoperative complications.

Keywords: Endoscopic, Endonasal, Skull base

EP-0011 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Three-Dimensional Reconstructed Image-Based Presurgical Planning for EC-IC Bypass: Technical Note

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Background: EC-IC Bypass is one of surgical techniques to induce revascularization. During the procedure, the identification of the site of recipient arterial branches and the extent of the craniotomy have been previously discussed in literatures but without reaching agreement. In this report, we primarily describe a new approach to identify the optimal cortical target point with preoperative 3D reconstructed image-based planning.

Method: We used free computer software (OsiriX Medical Imaging Software) that allowed us to create three-dimensional reconstructions of extracranial donor vessels within the scalp and recipient arterial branches on the cerebral surface. These reconstructions were made use of CTA images and compared with the true surgical view.

Results: The reconstructed extracranial donor vessels and intracranial recipient vessels can be easily created with free OsiriX software. This presurgical simulation methods reliably allows access to suitable surgical planning for EC-IC bypass surgery.

Conclusion: This free, simple, and user-friendly software platform allows the surgeon to improve presurgical planning, surgical procedures and outcomes.

Keywords: 3D reconstruction, OsiriX, EC-IC bypass, Cerebral revascularization

EP-0012 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

The Improvement in Visual Field with Change in Pituitary Tumor Volume

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A prospective data of 125 patients with pituitary adenoma presented at Liaquat National Hospital from 2010 till 2016. On admission, the presenting symptoms, duration, hormonal levels, MRI brain with pituitary protocol, visual field and acuity were carried out for each patient. The Knosp grading, modified hardy's classification and radiological classification were applied on each patient. The tumor volume was calculated pre and post operatively. The improvement in visual field with the change in tumor volume were evaluated. The mean follow up period was of 6 months.

Keywords: Pituitary tumors, Pituitary adenoma

EP-0013 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

The Proper Head Positioning for Middle Cerebral Artery Bifurcation Aneurysms Based on Dome Projections: Anatomical Study

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Background: The proper head positioning decreases the surgical complications by enabling a better surgical maneuverability. Middle cerebral artery bifurcation aneurysms have been classified by Dashti et al. as the intertruncal, inferior, lateral, insular, complex types based on dome projection. Our aim is to identify the optimum head positions and to explain the anatomic variables which may affect the surgical strategy of middle cerebral artery bifurcation aneurysms.

Method: The 4 (8 sides) formalin-fixed and silicone injected adult cadaveric heads were fixed using Mayfield holder. The lateral supraorbital approach was performed with 20° head extension and 0°-45° rotation to the contralateral side by taking a measurement at each 15° intervals and the appropriate sylvian fissure dissection are performed. A digital camera was placed 20 cm far from heads at the neutral position for recording pictures.

Results: The distal sylvian fissure dissection may be preferred for insular type and the proximal sylvian fissure dissection may be preferred for all other types. 15 degree head rotation was found as the most suitable position for the intertruncal, lateral type and subtype of complex aneurysms related with superior trunk. 30 degree head rotation was found the most suitable position for the inferior type, insular type and subtype of complex aneurysms related with inferior trunk.

Conclusion: The head positioning in middle cerebral bifurcation aneurysms surgery is a critical step. It should be tailored according to the projection and its relationship with the parent vessels of the middle cerebral bifurcation.

Keywords: Middle cerebral artery bifurcation, Lateral supraorbital approach, Head positioning, Intracranial aneurysm

EP-0014 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Comparative Surgical Anatomy of the Anterior Interhemispheric Approach and Pterional Approach for Anterior Communicating Artery Aneurysms

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Aim: To compare the pterional approach and the anterior inter-hemispheric approach for enabling a better surgical maneuverability. We describe the ideal the anatomic limitations of this surgery for anterior communicating artery aneurysms.

Method: Four formalin-fixed and silicone injected human heads were used for each approach. Möller 20-1000 microscope was used for dissection and all the photographs were obtained at a similar angle to the surgical microscope, with Canon EOS Rebel T5 Digital SLR Digital Camera with a EF 100mm f/2.8L Macro IS USM Lens and a Canon MR-14EX II Macro Ring Lite Flash. Our dissection includes anterior interhemispheric and pterional approach with gyrus rectus resection and posterolateral orbitotomy.

Results: Pterional Approach was performed followed by the gyrus rectus resection and posterolateral orbitotomy. This area can be exposed by the 1 x 1 cm resection of the gyrus rectus. Subpial resection from posterior part of gyrus rectus is required. Posterolateral orbitotomy was performed and the orbital roof was removed up to the superior orbital fissure. The anterior inter-hemispheric approach allows better visualization of the anterior and inferior surface of anterior communicating artery, A1-A2 junction and the optic nerve.

Conclusion: We believe the pterional approach combined with gyrus rectus resection and posterolateral orbitotomy, if needed, is more suitable for anterior, posterior and inferior type, with anterior inter-hemispheric approach being the safer for superior and high positioned anterior communicating artery aneurysms.

Keywords: Pterional, Inter-hemispheric, Orbitotomy, Gyrus rectus resection

EP-0015 [Neurovascular Surgery » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Supraorbital Keyhole Craniotomy: Operative Technique and Complication Avoidance

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Background: The development of microsurgical techniques and instrumentation with the aid of excellent preoperative diagnostic facilities, enables neurosurgeons to treat more complicated skull base diseases through smaller and more specific approaches. The endoscopic supraorbital keyhole approach for anterior and some middle cranial base lesions has been increasingly used in clinical practice. The aim of this study is to describe the technical details of the procedure and how to avoid complications related with it.

Method: Nine preserved human cadavers from The Skull Base Lab of Weill Cornell Medical College, Cornell University, New York were used. A total of 18 supraorbital keyhole craniotomies were conducted. The distances between the target anatomical structures were measured.

Results: After an eyebrow skin incision with careful soft tissue dissection and single frontobasal burr-hole, a supraorbital craniotomy is carried out with a diameter of about 1.5 to 2.5 cm. The complications associated with the procedure were also addressed.

Conclusion: The endoscopic supraorbital keyhole craniotomy is

an effective, valuable and alternative minimally invasive route to anterior and middle skull base lesions.

Keywords: Supraorbital craniotomy, Technique, Complication, Skull base

EP-0016 [Neurovascular Surgery » Endovascular Surgery]

Endovascular Stenting of an Intraoperative Thoracic Aortic Injury During Revision of Spinal Instrumentation: An Excellent Alternative

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Iatrogenic vascular injury is an uncommon and lethal complication of spinal surgery. We present a case of intraoperative thoracic aortic injury when dissection around the screw for the removal of the misplaced spinal fixation device. Intraoperative emergent endovascular aortic stent are found to be effective and it is an excellent alternative to keep in mind for this case during anterolateral approach spinal surgery.

Keywords: Aortic injury, Spinal instrumentation, Endovascular aortic stent

EP-0017 [Neurovascular Surgery » Endovascular Surgery]

Triple Protection Technique in Stenting of Critical Cervical Internal Carotid Stenosis

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Background: Dealing with critical cervical internal carotid artery (ICA) stenosis (more than 80%) is technically challenging as those patients are at higher risk of distal emboli and the use of protective devices against that is mandatory. We present the technique of using of triple protection for maximal guarding against distal embolism.

Method: This study was conducted on 12 patients with critical cervical ICA stenosis that were dilated and stented with the help of triple protection (two proximal balloons and a distal filter).

Results: Safe adequate dilation and stenting was achieved in studied cases with no new added neurological deficit or recurrence of symptoms for 3 month follow-up.

Conclusion: Triple protection technique ensures safe stenting for critical cervical ICA occlusion

Keywords: Carotid stenosis, Stenting, Protective devices

EP-0018 [Neurovascular Surgery » Endovascular Surgery]

Endovascular Treatment of ACoM Aneurysm with Fenestration

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Fenestration at ACoM localization was relatively frequent. Fenestrations might involve A1, A2 and ACoM in majority of the cases. Risk of rupture in these patients were reported to be statistically higher. 59-year-old female presented with headache. On cerebral angiography aneurysm with a size of 8x7 mm were detected at ACoM region. Right A1 was dominant and the aneurysm was coiled after an Atlas intracranial stent was introduced from right A2 to right A1. There were no complications reported at the postoperative period and the aneurysm was reported to be totally occluded at 3 months follow-up angiography. Endovascular treatment is feasible for aneurysms of ACoM together with fenestrations. Immediate anatomical visualization at the beginning of treatment was provided with routemaps. Fenestrations might not constitute an obstacle to endovascular treatment, in fact they might be an advantage to prevent thromboembolic events at the aneurysm neck since the neck involves fenestration not the ACoM in these patients.

Keywords: Fenestration, ACoM, Endovascular treatment, Endovascular surgery, ICA, Intracranial aneurysms

EP-0019 [Neurovascular Surgery » Endovascular Surgery]

Endovascular Treatment of Multiple Cerebral Aneurysms Associated with Aortic Coarctation

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We aimed to display the case of a young patient with an aortic coarctation on his background, who presents subarachnoid hemorrhage Fisher grade IV. A 23 years old man, arrived with systemic hypertension, secondary to coarctation of the aorta, treated with an extra-anatomic tube. Patient came to ER with an intense and sudden headache, pain 10/10 points, drowsiness. Non-cooperative, pupils of 3 mm, right eye ptosis. CTS performed, the findings were Subarachnoid hemorrhage, aortic pseudoaneurysm. Brain angiography by right radial approach was performed and showed severe vasospasm of right carotid system and multiple

sacral aneurysm in right posterior communicating and choroid segment, anterior communicating artery, M1 segment of left middle cerebral artery. Embolization performed in the right carotid system aneurysm with 6 coils and chemical angioplasty was done with nimodipine in this hemisphere. Then 3 coils were placed in the aneurysm of left middle cerebral artery M1 segment and the anterior communicating artery aneurysm was treated with Stent Lvis Jr 3.5mm x 23mm and 2 more coils. In this case, the aortic stenosis leads the multiple intracranial aneurysm and the progressive increase of systemic arterial tension produced right posterior communicating artery aneurysm rupture, the ruptured aneurysm and the incidental aneurysm were treated with endovascular therapy. Endovascular therapy in cerebral aneurysms on patients with aortic stenosis is a good curative technique that requires multidisciplinary therapeutic options to avoid complications. In this case multiple serial chemical angioplasties were performed to improve the clinical and angiographical condition of the patient.

Keywords: Aneurysms, Aortic coarctation, Endovascular treatment, Subarachnoid hemorrhage, Coils

EP-0020 [Neurovascular Surgery » Endovascular Surgery] Feasibility of Neck Extension to Overcome the Difficult Aortic Arch to Access to Carotid Artery

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Background: Many neurointerventionists occasionally encountered cases that access to the carotid artery is difficult due to various conditions of aortic arch. The purpose of this study was to investigate the neck motion and condition of aortic arch that may have influence on access to the carotid artery.

Method: We reviewed that 230 patients who underwent carotid angiography (Right 209 and Left 208). Failing using Simple Davis catheter (SDC), the movement (right, left, flexion and extension) of patient's head was tried before the catheter exchange. We analyzed that success rate after head motion and relation with aortic arch factors.

Results: Only the extension of the patient's neck movement was effective. Of the 209 patients on the right angiogram, 23 had failed to access with SDC, but the neck extension was effective in 3 patients (13%). There were significant correlations with fail to SDC in the age, male, acute angle, arch elongation, aortic calcification and CCA angulation. ($p < 0.05$). Twenty four of 208 patients who underwent left angiography were not able to approach with SDC, but seven were successful in the neck extension (29.2%). Also, age, male sex, acute angle, arch elongation, and aortic calcification were significant factors of the catheter exchange. ($p < 0.05$). In the SDC failure group, neck extension was significantly more effective at younger age and acute angle. (Respectively $p = 0.008$ and 0.044).

Conclusion: Neck extension could help to overcome the conditions of aortic arch such as elderly, acute angle, elongation and calcification that simple angiography is difficult.

Keywords: Angiography, Aortic arch, Catheter, Neck motion

EP-0021 [Neurovascular Surgery » Endovascular Surgery] Endovascular Coiling Versus Surgical Clipping of Very Small Ruptured Anterior Communicating Artery Aneurysms in the Endovascular Era

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Background: Endovascular coiling of anterior communicating artery (ACoA) aneurysms has evolved and is safe and effective. However, limited data regarding the safety and efficiency of endovascular coiling of very small ruptured ACoA aneurysms compared with surgical clipping are available.

Method: We conducted a retrospective review of consecutive 112 patients with very small ruptured ACoA aneurysms treated with endovascular coiling or surgical clipping. Very small aneurysms were defined as aneurysm maximal size ≤ 3.0 mm. Patients were grouped into coiling and clipping groups. Baseline characteristics, postoperative complications, clinical outcomes were compared between the 2 groups.

Results: Forty six (41.1%) patients successfully underwent coiling and 1 (0.9%) patient failed coiling because of procedure-related A1 segment dissection. 65 (58.0%) patients underwent surgical clipping including 2 patients who failed coiling underwent clipping. Patients with smaller aneurysms ($P = 0.028$) or a complete A1 segment configuration ($P = 0.009$) more often underwent surgical clipping and those with a symmetric A1 segment configuration more often underwent coiling ($P = 0.011$). There were relatively higher rates of early rebleeding and cerebral infarction in patients treated with clipping compared with coiling, without statistically significant difference. Clinical outcomes at discharge and at last follow-up were similar between the two groups.

Conclusion: Most patients with very small ruptured ACoA aneurysms can be safely and effectively treated with endovascular coiling with a relatively lower complication rate. However, a smaller aneurysm size still limit the use of endovascular coiling and the development of newer devices and techniques for very small aneurysms is needed.

Keywords: Anterior communicating artery aneurysm, Rupture, Coiling, Clipping, Complication, Outcome

EP-0022 [Neurovascular Surgery » Endovascular Surgery] Analysis of Intraarterial Thrombolysis and Trombextraction in Patients with Intraoperative Thromboembolic Complications in Endovascular Neurosurgery

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Background: Intraoperative thromboembolic complications in endovascular neurosurgery is the life-threatening consequences for the patients. Thromboembolic complications are significant percentage of all complications in endovascular interventions, close

37% according by different authors (AA surgery - 2.7% - 17%, AVM surgery - 1% - 8%, stenting (ICA, VA, MCA) - 3.6% - 12.3%). In this regard, the importance of intraoperative removal thromboembolic clots by endovascular thrombolysis or mechanical thrombectomy is very high. Our aim was to evaluate and compare the results and effectiveness of intraarterial thrombolysis versus mechanical thrombectomy in patients with thromboembolic complications.

Method: The results of intraarterial thrombolysis using rT - PA (recombinant tissue plasminogen activator) in 10 patients and intraarterial mechanical thrombectomy by using "SOLITAIRE" stent in 5 patients. Thrombolysis was performed in 2 patients with AVM, 3 patients with carotid stenting in 5 patients with AA. Complete recanalization was achieved in 4 patients, partial recanalization - 3, with no result - 3, according by DSA. The effectiveness of thrombolysis was also evaluated by mRS, 30% of patients had deterioration from 2 to 4 points. Intraarterial mechanical thrombectomy performed in 5 patients with AA. Total recanalization was achieved in all cases. According mRS deterioration is not observed.

Results: Both of this methods had positive results in this study.

Conclusion: While assessing data digital selective angiography and data of mRS, intraarterial mechanical thrombectomy prevails and more effective.

Keywords: Endovascular, Thromboembolic, Complications, Intraarterial, Thrombolysis, Thrombectomy

EP-0023 [Neurovascular Surgery » Endovascular Surgery]

Safety and Efficacy of Antiplatelet Response Assay and Drug Adjustment in Coil Embolization: A Propensity Score Analysis

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Background: The purpose of this study was to explore the safety and efficacy of an antiplatelet response assay and drug adjustment to prevent delayed thromboembolic events after stent-assisted coil embolization.

Method: A total of 370 patients were enrolled in this study between December 2005 and July 2014. Of these, 124 patients were placed into the drug resistance test (DRT) group with drug adjustment according to response to an antiplatelet agent, and 246 patients comprised the control group with a standard antiplatelet regimen. The response to the antiplatelet agent was evaluated with the VerifyNow Rapid Platelet Function Assay. Propensity score matching analysis was performed with one-to-multiple matching.

Results: Among 370 patients, delayed thromboembolic events occurred in 28 (7.6%) patients including 25 (10.2%) in the control group and three (2.4%) in the DRT group. Antiplatelet response test (p=0.012), DM (p = 0.014), and HTN (p<0.001) were associated with delayed infarction in multivariate analysis. In propensity score

matching analysis, 331 patients were matched (control group (n = 229) vs. DRT group (n=103)), and antiplatelet response (hazard ratio 0.247, 95% confidence interval 0.070-0.868, p= 0.029) was correlated with delayed infarction. Conversely, the two groups were not significantly different with regard to total (p = 0.368) or major hemorrhagic complications (p = 0.108).

Conclusion: Antiplatelet drug adjustment according to the results of an antiplatelet response assay might be associated with a decreased risk of delayed thromboembolic infarction compared with the standard antiplatelet regimen.

Keywords: Aneurysm, Stenting, Interventional radiology, Thromboembolism, Antiplatelet drug resistance

EP-0024 [Neurovascular Surgery » Endovascular Surgery]

Preoperative Transarterial Embolization Combined with Transnasal Endoscopic Resection of Nasopharyngeal Angiofibroma: Double Center Experience

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Background: Juvenile nasopharyngeal angiofibroma (JNAF) is a highly vascular lesion characterized by high rate of recurrence. preoperative embolization of juvenile nasopharyngeal angiofibromas (JNA) has been shown to reduce operative times and blood loss JNAF account for 0.05% of all head and neck tumors and affects exclusively teenage boys. The classic triad of epistaxis, unilateral nasal obstruction, and a mass in the nasopharynx suggests a diagnosis of JNA to be confirmed by imaging. This study reports and validates efficacy and safety of trans-arterial embolization combined with transnasal endoscopic resection of JNAF by coils instead traditional surgical approaches as primary modality of treatment.

Method: Between February 2010 and August 2016, a total of 20 patients (all male) with JNAF were treated by endovascular trans-arterial approach combined with transnasal endoscopic resection in departments of neurosurgery and otorhinolaryngology, Tanta, and Sohag Universities, Egypt. Follow-up was done for 6 months at least.

Results: There is evident decrease in the amount intraoperative blood loss (375 ml), length of hospital stay (3 days) and complications. only one patient had recurrence during follow up period (after 18 months) and retreated by embolization and endoscopic resection. No technique related morbidity or mortality in our series.

Conclusion: Transarterial embolization combined with endoscopic resection of JNAF is proved to effective and safe technique with better outcome and less complications. Recurrence rate was not appreciably affected.

Keywords: Nasopharyngeal angiofibroma, Transarterial embolization, Transnasal endoscopic resection

EP-0025 [Neurovascular Surgery » Endovascular Surgery] Must We Treat Large or Giant Wide-Necked Brain Aneurysms with Flux Diverter Devices?

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Rapid and striking development in techniques and devices make it possible to treat endovascularly most of cerebral giant wide-necked aneurysms. Stents flux-diverters have become one of the most important tools in treating difficult aneurysms not feasible for simple coiling or surgery. The physical features, dimensions and functional characteristics of the stents show considerable differences. There are also several strategies and tips to treat difficult aneurysms by using stents and coiling. Nevertheless, solid firsthand experience in clinical practice as well as knowledge of the stents are required to treat cerebral giant wide-necked aneurysms safely and effectively. In this report we present our experience on the convenience of using flux-diverter stents and potential risks of its indiscriminate use.

Keywords: Intracranial giant wide-necked aneurysm, Stent, Endovascular procedures

EP-0026 [Neurovascular Surgery » Endovascular Surgery] Postoperative Optic Neuritis after Successful and Uneventful Endovascular Flow Diverter Stent Placement for a Paraclinoid Aneurysm

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Optic neuritis is an inflammatory optic nerve disorder that could be occurred on an ischemic process. Optic neuritis based on ischemic optic neuropathy can cause postoperative visual loss. Endovascular Flow Diverter Stents can be used to treat the paraclinoid aneurysms. A 40 year old female was admitted to our department because of headache. Her neurological and ophthalmological examinations were normal. On 3T non-contrast material enhanced magnetic resonance (MR) angiography (MRA) with TOF technique, there was a 3x2 mm sized blister like aneurysm in paraclinoid segment of the left internal carotid artery. An appropriate size flow diverter stent was applied to the aneurysm via endovascular route. In early postoperative period, the patient had gradual visual loss and retro-orbital pain in her left eye. In the ophthalmologic examination the optic nerves were normal. Edema and contrast-material enhancement in left optic nerve sheath was observed on high-resolution 3T MR imaging. A presumed ischemic inflammatory process was occurred in the left optic nerve due to an occlusion developed in the left ophthalmic artery caused by the stent applied to the aneurysm. Endovascular aneurysm treatment is an alternative to surgical clipping of aneurysms. Although visual symptoms related to paraclinoid aneurysm have been reported

in literature, it could also be possible for visual symptoms to arise or worsen after endovascular treatment. It should be minded that endovascular treatment of an internal carotid artery aneurysm may cause ischemic process on optic pathways so visual consequences may occur after the procedure because of the anatomic inclination of the ophthalmic artery in relation to the carotid siphon and paraclinoid aneurysm.

Keywords: Paraclinoid, Stent, Optic, Neuritis, Flow, Diverter

EP-0027 [Neurovascular Surgery » Endovascular Surgery] Stent Anchoring Technique for Stent Deployment Across a Wide Necked Middle Cerebral Artery Aneurysm

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Endovascular treatment for wide-necked aneurysms usually needs to be treated via stent assisted coiling. To deploy the stent across the wide necked aneurysm, microcatheter navigation into a distal vessel is mandatory. But in bifurcation aneurysms with distal vessel originating from parent artery with nearly right angle, advancing the microcatheter together with microguide wire would be challenging. We described a case of successful stent deployment across a wide necked middle cerebral artery aneurysm using stent-anchoring technique. As the distal artery was originating with a right angle from the parent artery, passing beyond the aneurysm with standard microcatheter navigation was not possible. Microcatheter was looped inside the aneurysm and navigated into distal vessel through the aneurysm neck. Stent was deployed partially distal to aneurysm in order to function as an anchor while withdrawing the microcatheter to straighten the loop of the microcatheter inside the aneurysm. Stent was deployed completely across the aneurysm neck followed by successful coiling. Stent anchoring technique can be a feasible way of deploying stent across the aneurysm neck where distal microcatheter navigation is technically compelling.

Keywords: Aneurysm, Endovascular, Stent anchoring technique

EP-0028 [Neurovascular Surgery » Endovascular Surgery] Derivo Flow Diverter in the Treatment of Intracranial Aneurysms: Endovascular Results with Bluxide Surface Coating

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Background: Derivo flow diverters were introduced into the market to have more successful results than the previous versions. Bluxide surface coating was presumed to induce low thrombogenicity in the target vessels.

Method: 66 patients were treated with Derivo flow diverter between June 2016 and January 2017 at Ankara Numune Education and Research Hospital of University of Health Sciences for 75 aneurysms. Mean follow-up was 3.5 months. Mean age of the patients was 54 and 42 of these patients were female. Aneurysm localizations of 66 patients were listed as: 51 ICA, 7 vertebrobasilar, 4 A1-ACoM and 3 M1-MCA regions.

Results: Stent thrombosis was not noted in any of these patients. 1 thromboembolic event and 1 hemorrhagic stroke on the contralateral site of the treated aneurysm at day 39 were the two symptomatic events.

Conclusion: Early postoperative results of Derivo flow diverters were technically successful according to the data in the present series. Long term results with the aneurysm occlusion results will be the target of the second half of the present study.

Keywords: Derivo flow diverter, Endovascular treatment, Endovascular surgery, Intracranial aneurysms, ICA

EP-0029 [Neurovascular Surgery » Endovascular Surgery]

Endovascular Treatment of an Arteriovenous Malformation (AVM) of the Posterior Fossa Associated with a Giant Aneurysm in One Session

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A 23 years old male patient who presented with dizziness, unilateral hearing loss, facial palsy, nystagmus, dysmetria and syncope associated with ventricular (VES) and supraventricular extrasystoles (SVES) was found to suffer from a monstrous vascular lesion in the posterior fossa. Digital subtraction angiography detected a very large AVM originating from a hypertrophic right AICA and a giant arterial aneurysm originating from the same vessel resulting in massive ventrolateral dislocation of the brain stem and compression of the fourth ventricle. Within one interventional session a Scepter balloon catheter was positioned via the right side into the fistula point and a Marathon microcatheter was placed via the left side in the venous drainage of the AVM. We obstructed uttermost proximal point of venous drainage with two coils and stabilized the obstruction by fractionated application of Onyx 18 under continuous retraction of the Marathon catheter. Afterwards, we embolized the most distal part of the parent artery of the giant aneurysm by the placement of multiple coils. In the result, the complete lesion was occluded without intraprocedural complications. Post-interventional, patient's symptoms resolved completely with exception of minimal superior branch facial palsy and intermittend saccadic eye movements. Control MRI showed no ischemic lesions. For the first time in literature, we describe the complex endovascular treatment of an AVM and a giant aneurysm of the posterior fossa in one therapeutic session.

Keywords: AVM, Giant aneurysm, Posterior fossa

EP-0030 [Neurovascular Surgery » Endovascular Surgery]

Primary Coiling with the Assistance of Temporary Stent for Support for Coils or/and Catheter Stabilization

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The main goal for endovascular aneurysm treatment is filling aneurysm cavity with enough bulk of coils for cutting the flow through there from the main artery. Especially in wide neck aneurysms stabilization of coils in the cavity and preventing the prolapsus of them through main artery is essential for lower complication rates. Stent or balloon assisted coiling methods are being used for these purposes. However the temporary flow decrease in main artery while using balloon assisted catheters may cause severe disability especially for elder patients. On the other hand early or late resistance to anticoagulant therapy may be a risk for stent placement. In addition to these risks, the shape of aneurysm is substantial for catheter stabilization and proper coiling. Narrow necked but lengthy shaped (double-necked) aneurysms may incur coiling procedure. Temporary stenting may be used to prevent facing the challenges mentioned above for some cases. We presented three cases which were treated with primary coiling with the help of thrombectomy stents between October 2016 and January 2017 Two cases were bled MCA aneurysms which their shapes were lengthy and narrow. The catheter stabilization was achieved by the help of the temporary stent. The third case was an unbleeded basilar aneurysm which the patient showed resistance to anticoagulant therapy. All three patients discharged uneventfully. Temporary stenting may provide enough support for preventing coil prolapsus in wide necked aneurysms, as well as enough catheter support for lengthy aneurysms in which the catheter rarely stands stable

Keywords: Temporary, Stent, Coil, Endovascular

EP-0031 [Neurovascular Surgery » Endovascular Surgery]

Post-Traumatic Pseudoaneurysm of the Internal Carotid Artery with in the Sphenoid Sinus

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Pseudoaneurysm formation within the sphenoid sinus is a rare but potentially fatal complication of traumatic skull base injury. This report aims to present such a case and to discuss the relevant diagnostic and treatment aspects. A 27 year old man who sustained a head trauma following motor vehicle accident. On admission, patient had a Glasgow Coma Score of 10. There was monoparesis of the left upper extremity, which was later attributed to a co-existing brachial plexus injury. Computed tomography demonstrated traumatic subarachnoid hemorrhage and multiple fractures encompassing the central skull base. The radiographic pattern of the hemorrhage prompted further work-up to rule out a vascular

injury. Angiographic studies revealed a large pseudoaneurysm within the sphenoid sinus arising from the cavernous segment of the internal carotid artery (ICA). The pseudoaneurysm was treated endovascularly using flow diverters and coils. Post-procedural imaging confirmed complete obliteration of the aneurysm and distal patency of the ICA. Patients were discharged with a Glasgow outcome score of 4 (mainly due to the brachial plexus injury). Prompt diagnosis and treatment of vascular injury following skull base trauma is crucial in avoiding a potentially fatal outcome.

Keywords: Internal carotid artery, Pseudoaneurysm, Sphenoid sinus, Trauma

EP-0032 [Neurovascular Surgery » Endovascular Surgery]

Modern Endovascular Methods in Treatment of CCF-s

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Three various Patients with different post-traumatic Carotid-Cavernous Fistulas.

- 1- Full Damage of right ICA in Cavernous Part. Treated with Combined Approach- Microsurgical ligation of ICA and Endovascular – transarterial occlusion of the Fistula and its afferent Vessel with Coils using Dual Microcatheterisation through Acom A and Pcom A.
- 2- Spontaneous CCF supplied from Extra - Inta Carotid Arteries, with Mono Venous Drainage in dilated supra orbital Vein. Treated with transarterial and transvenous approach and placing coils into the Fistula.
- 3- Posttraumatic CCF with multiple damage of left ICA in Cavernous Part. Treated with transarterial Coil occlusion of the Fistula using Balloon assisted Technique.

In all Cases with Various Methods of Treatment full occlusion of the CCF-s were achieved. Modern endovascular technologies allows us to select an Operation Method and solve the Problem of CCF-s taking into consideration the type of damage and anatomical features.

Keywords: Endovascular treatment, CCF, Trans arterial-trans venous treatment

EP-0033 [Neurovascular Surgery » Endovascular Surgery]

Sandwich Technique (=Stent Assisted Coil) for Carotid-Cavernous Fistula Treatment

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Background: Endovascular procedure such as occlude the cavernous sinus with detachable balloon or detachable coil, has been widely accepted to treat direct carotid cavernous fistula (CCF). Authors report our 9 cases of CCF patients who were successfully treated by endovascular procedures with review articles.

Method: 9 patients (6 men and 3 women; age range 35-62 years old, mean=40.5) with high flow CCFs underwent endovascular treatment. We retrospectively analyzed endovascular treatment of the CCFs. First 3 patients treated with coil embolization only and next 6 patients treated with stent assisted coil. Stent assisted coil embolization, author used larger sized coil (about 2 times larger than sinus size) place into the cavernous sinus until the contrast media filling markedly decreased in to CCF, and then Enterprize or Solitair stent paced over the cavernous sinus along the cavernous portion of ICA.

Results: All patients treated completely by the endovascular method. 3 patients treated coil only, required mean 8.4 pieces of coil while 6 patients treated with stent assisted coil, used 5.2 pieces of coil.

Conclusion: Various skull base approaches tried for the CCF until the endovascular treatment developed. Now endovascular treatment became the treatment of choice for CCF. But in some cases the coil for filling the cavernous sinus required large amount. Authors would like to propose stent assisted coil embolization for CCF treatment is easy and safe method of endovascular treatment.

Keywords: Carotid-cavernous fistula, Endovascular treatment, Stent, Coil embolization

EP-0034 [Neurovascular Surgery » Endovascular Surgery]

WITHDRAWN

EP-0035 [Neurovascular Surgery » Ischemic Disorders]

Neuroprotective Effect of Raloxifene, Tibolone, and Exogenously Administered 17 β Estradiol in Ischemic Brain Injury

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Stroke risk is lower in premenopausal women relative to men, but there is a well-known increase in cerebrovascular events in women after menopause. However studies about the effect of hormone replacement therapy such as tibolone and 17 β Estadiol and selective estrogen receptor modulators such as raloxifene have been inconsistent for stroke incidence and outcome in postmenopausal women. The purpose of this experimental study was to determine whether or not tibolone and raloxifene protect against ischemic injury in brain in vivo. Ischemia was induced with a four-vessel occlusion technique (Pulcinelli) in 50 animals with the duration of 15 minutes. Sham and ovariectomized-control group of animals (OVX-C and Sham group) received daily placebo, while OVX-T group and OVX-E group received 250 μ gr/kg Tibolone, 100 μ gr/kg 17 β Estradiol and 5 mg/kg raloxifene via gavage route for fourteen days, respectively. Rats were sacrificed 24 hours after the onset of ischemia with intracardiac perfusion of 10 % neutral formol. Right and left hippocampal regions were obtained from coronal sections

(6 micrometer thickness) were stained with haematoxylin eosin. The CA1 and CA3 subfields of hippocampus were examined in both sides of brain. The viable neuron numbers in hippocampal CA-1 area were significantly higher for endogenous and exogenous estradiol groups than other groups. The neuroprotective effect of endogenous estrogen (sham) and 17 β Estradiol was identical in this area. The viable neuron number of raloxifene group is also significantly higher than the others in hippocampal CA-3 area.

Keywords: Stroke, Tibolone, HRT, Ischemia, Raloxifene

EP-0036 [Neurovascular Surgery » Ischemic Disorders]

A Case of a Successful Revascularization for Moya-Moya Disease with Predominant Involvement of the Bilateral Posterior Circulation

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Moya-Moya disease (MMD) in adult Caucasian population is very rare. Superficial temporal artery (STA)-to-middle cerebral artery (MCA) bypass remains the method of choice for treatment of MMD in adults. We describe a case of successful revascularization for a young patient with MMD with bilateral temporo-occipital infarctions. A 37-year old male was referred to our department from an outside hospital with a cortical blindness, sensori-motor aphasia and cognitive decline. 9 months and 2 months earlier he sustained two ischemic strokes manifested by speech dicturbances and visual loss, respectively. Magnetic resonance imaging (MRI) revealed multiple infarcts in both hemispheres with the largest in the right temporo-parieto-occipital region, right frontal lobe (late subacute), left temporo-occipital region and left temporal lobe (acute). Digital subtraction angiography (DSA) showed bilateral carotid and a right posterior cerebral artery occlusion. STA-MCA bypass was performed first on the left side using the frontal branch of the STA. In the early postoperative period (1 month) patient's vision slightly improved, his speech comprehension and expression almost returned to normal along with the extension of his daily life activities due to better cognitive performance. Immediate follow-up DSA demonstrated complete patency of the anastomosis and the patient was scheduled for the elective STA-MCA bypass on the right side. STA-MCA bypass remains a "gold" standard of treatment for MMD in adults. This method may give a good chance of clinical improvement even in case of an atypical MMD presentation with the involvement of the posterior circulation.

Keywords: Moya-Moya disease, Ischemic stroke, Carotid occlusion, Extra-intracranial bypass

EP-0037 [Neurovascular Surgery » Ischemic Disorders]

The Role of Carotid Artery Reconstructive Operations in the Recovery of Neurological Disability in Patients with Transferred Ischemic Stroke

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The study deals with cerebral tissue stupefaction phenomenon caused by internal carotid artery stenosis before and after endarterectomy. Carotid endarterectomy was performed in 50 patients who underwent ischemic stroke, selected based on NASCET criteria, after conventional hours of therapeutic window expiration. Following methods were used: neurological examination with sistematization of data according to Barthel and Ashworth indexes, to Fugl Meyer scale, superior and inferior Rivermed scale, investigations (cerebral CT and MRI), carotid vessels' doppler examination, carotid angiography. Carotid endarterectomy was initially a secondary stroke prevention method, proved to be a good treatment option as well (significant improvement of disability degree in patients who underwent ischemic stroke). Study results lead to the conclusion that ischemic cerebral tissue preserves recovery capacity after conventional hours of therapeutical window (stupefaction phenomenon of ischemic cerebral tissue). This is the etiopathogenetic basis of cerebral tissue preconditioning phenomenon, largely described in contemporary scientific medical literature (animal models).

Keywords: Stupefaction phenomenon, Carotid endarterectomy, Ischemic stroke, Preconditioning phenomenon

EP-0038 [Neurovascular Surgery » Ischemic Disorders]

Symptomatic Giant Fusiform Aneurysm in the Elder Patient

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Cerebral aneurysm is the result of a budding (saccular) out of a point on an artery or ballooning segment (fusiform) of an artery. Congenital and subsequent degenerative changes both play a role in the formation of aneurysms. To date, many cases can be treated with appropriate surgery and endovascular intervention. Here, we present a case of fusiform aneurysm, which was turned to symptomatic in an advanced age. A 79-year-old male patient presented to the emergency department with a 3-day history of progressive imbalance and double vision and increased current imbalance. He had hypertension and coronary artery disease was in his past medical history. His neurological examination revealed right central facial paralysis and inward gaze palsy on the right. Diffusion magnetic resonance image (MRI) was normal. Cranial MRI showed cerebral atrophy and T1-sequence hypointense and T2-sequence aneurysmatic lesion in brain stem junction. Cranial MR angiography revealed a fusiform aneurysm in the right vertebrobasilar artery. In this case, it was observed that the lesion dimensions were larger than 1 cm and making pressure the brain stem. Neurosurgeons recommended non-surgical care to the patient. Aneurysms are classified according to etiology and size. Surgical risks are closely related to the localization and the pre-surgical bleeding history of the aneurysm. Although being symptomatic, our patient has been directed to medical treatment due to his advanced age, having mild neurological impairment and the presence of an unruptured giant aneurysm.

Keywords: Giant fusiform aneurysm, Elderly, Unruptured

EP-0039 [Neurovascular Surgery » Ischemic Disorders]**Compare the Hemorrhagic Complication Rate After Intraarterial Thrombolysis with Stent Retrievers Weather tPA Infusion or Not**

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Background: Intraarterial thrombolytic therapy (IA-Tx) with stent retriever is accepted as an additional treatment for selected patients. But hemorrhagic complication rate weather intravenous tissue plasminogen administration or not before the IA-Tx with Solitaire device, is not reported yet. Authors tried to find the clinical outcomes according to the IV-tPA before the IA-Tx and perfusion diffusion mismatching (P/D-mismatching).

Method: Eighty-one treated IA-Tx with the Solitaire device, diagnosed as anterior circulation larger vessel occlusion were included in this study. CT-angiography was done as an initial diagnostic image and acute stroke MR imaging followed after the IV-tPA. 42 patients were in the tPA group and 39 patients were in the non-tPA group. Recanalization rate, clinically significant hemorrhagic (sICH) and clinical outcomes were recorded according to weather IV-tPA or not.

Results: Recanalization rate was 81.0% in IV-tPA group, and it was 69.2% in non-tPA group ($p=0.017$). While sICH were 19.9% and 25.6% respectively ($p=0.328$). Neurologic outcomes also did not influence by tPA infusion or not. But according to the P/D-mismatching or not, the recanalization rate and sICH were 91.9% and 16.7% in the mismatched group and 46.7% and 46.7% in the matched group ($p=0.008$ & $p=0.019$, respectively).

Conclusion: For patients treated with IA-Tx with stent retriever, weather IV-tPA influence or not did not influence on the sICH, recanalization rate and neurologic outcomes. While P/D-mismatching or not was correlated well with sICH, recanalization rate and clinical outcomes.

Keywords: Cerebral perfusion pressure, Decompressive craniectomy, Intracranial pressure, Outcome, Mean arterial pressure

EP-0040 [Neurovascular Surgery » Ischemic Disorders]**Recanalization Rate After Tissue Plasminogen Activator Administration in Patient with Larger Artery Intracranial Occlusion Disease**

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Background: Intravenous tissue plasminogen activator (IV-tPA) treatment is the first line and intraarterial thrombolysis (IA-Tx) with retrieval stent is optional treatment method for acute ischemic stroke patients. But recanalization rate of the larger artery occlusion disease (LAICOD) is questionable.

Method: 212 patients with anterior circulation stroke patients were included in this analysis. Brain CT-angiography (CTA) was an initial imaging study and acute stroke MRI was immediately following the

IV-tPA administration. Recanalization rate and clinical outcomes were analyzed according to the IV-tPA administration and additional IA-Tx.

Results: The overall recanalization rate of LAICOD after IV-tPA was 16.0% (34 patients), favorable outcome was 82.4%. Remaining 178 non-recanalized patients after IV-tPA, 118 were no more treated and 60 were treated additional IA-Tx. Recanalization rate of additional IA-Tx was 80.0% and favorable neurologic outcome was 56.7%, which was better than those patients who were not recanalized after IV-tPA (42.4%, $p<0.05$). In additional IA-Tx patients, P/D-mismatching patients showed fewer hemorrhagic complications ($p=0.046$) and a more favorable clinical outcome ($p=0.000$) than P/D-matching patients.

Conclusion: On our study, initial image study was CT-angiography, and this dynamic imaging require less than 5 minute more than non-contrasted CT and no additional risk for contrast media usage. From this study, recanalization rate after IV-tPA in acute stroke caused by large artery occlusion is very low. Author would like to propose that dynamic brain CT as initial image study and in a selected patient, IA-Tx might be applied as primary therapy option.

Keywords: Acute stroke, Tissue plasminogen activator, Outcomes, Recanalization rate, Larger artery intracranial occlusive disease

EP-0041 [Neurovascular Surgery » Ischemic Disorders]**Stroke Management with Decompressive Craniectomies – Who Benefits?**

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Background: The decision for decompressive craniectomies remains still one of the most controversial issues in current neurosurgical practice. Although the routine use of ICP monitoring has produced some acceptable guidelines regarding stroke, there is a significant proportion of patients who present to the neurosurgeon with significantly worse GCS (and ICP) than the proposed by guidelines. Thus the question remains: Who really benefits from decompressive craniectomies?

Method: We are presenting our series of 40 Patients who underwent decompressive craniectomies for strokes. 15 were operated for MCA strokes as dictated by the guidelines, 16 were operated later following unsuccessful medical management and 9 were operated urgently after transfer to ER. Mean GCS=8,2.

Results: Out of 15 patients who had early craniectomies as indicated for MCA infarcts the survival rate was 93% and the mean GOS=3,6. Of 16 patients who had craniectomies following unsuccessful medical ICU management the survival rate was 75% and mean GOS=3,1. A subgroup with ICA infarcts fared worse. Of 9 patients who had craniectomies “beyond” the guidelines, survival rate was 44% and mean GOS=2.1 with only 16% achieving a favorable (4–5 GOS).

Conclusion: Our results demonstrate that;

1. Patients with MCA infarcts who undergo early decompressive craniectomies according to guidelines are the most likely to benefit the most especially in terms of GOS.
2. Massive ICA strokes as well as “Beyond guidelines” patients fare

poorly especially in terms of GOS, thus should be treated with a lot of scepticism.

3. Deteriorating patients with GCS>7 definitely deserve their chance.

Keywords: Stroke, Craniectomies, MCA

EP-0042 [Neurovascular Surgery » Ischemic Disorders]

The Experience of Dynamic CT-perfusion Control in Endovascular Treatment of Patients with Multifocal Stenotic and Occlusion Lesions of Cerebral Artery

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Aim: To evaluate the role of dynamic CT-perfusion control for determination of necessity, efficiency and sufficiency of endovascular treatment of MSOL of CA.

Method: The choice of staging and capacity of endovascular treatment of MSOL of CA depends on degree of perfusion deficit in different arterial basins and changes of these parameters after each endovascular session. 74 patients with MSOL of CA were operated by endovascular method with dynamic CT-perfusion control. CT-perfusiography was performed before endovascular treatment and after each endovascular session. Based on analysis of CT-perfusiography, the degree of perfusion deficit (by Powers W.J., 1991) and activity of compensatory reactions, patterns of cerebral angiospasm and hyperperfusion were defined. 98 endovascular operations were carried out from one to four sessions.

Results: The choice of sequence, staging and capacity of endovascular treatment of MSOL of CA depended on degree of perfusion deficit and compensatory reactions in different arterial basins and changes of these parameters after each endovascular session. The degree of perfusion deficit has been decreased by 1-2 grades at the end of the endovascular treatment in all cases. Good functional outcomes were in 90,6% cases (by modified Rankin Scale). The postoperative mortality and morbidity level — 0 %.

Conclusion: The usage of dynamic CT-brain perfusion control allows to define optimal sequence, staging and volume of endovascular treatment of MSOL of CA. Endovascular methods of treatment of MSOL of CA with dynamic CT-perfusion control are safe and effective ones.

Keywords: CT-perfusion, Cerebral arteries, Brain perfusion, Endovascular methods

EP-0043 [Neurovascular Surgery » Ischemic Disorders]

How to Justify Extra-Intracranial Bypass Surgery in Carotid Artery Occluded Patients?

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Aim: To study influence of EC-IC bypass on brain efficiency.

Method: Structural and functional changes of cerebral circulation (CC) and central nervous system (CNS) were studied in 72 patients before and after revascularization. We used angiography, transcranial dopplerography with evaluating cerebrovascular reactivity and resistance, brain CT, scaling neurological disorders, neuropsychological inspection (anxiety, depression, cognitive functions), simple sensorimotor reaction.

Results: Amount of collaterals involved into collateralization and sufficiency of cerebrovascular reserve capacity define extent of brain damage, degree of neurological, psychological disorders, brain efficiency. We have find mostly moderate ($0.5 < r < 0.74$) and reliable correlation ($p < 0,05$) between cerebrovascular reserve capacity, neurological disorders, anxiety, depression and brain efficiency. Shift in brain efficiency after revascularization was found both in patients with preserved and failed CC and CNS compensation. In patients with failed CC and CNS compensation even excellent functioning bypass does not result in significant improvement of neurological disorders. But this group of patients had some improvement in neuropsychological status, in brain efficiency, and this shift is legitimate to consider it as bonus for future rehabilitation.

Conclusion: EC-IC improves brain efficiency in all groups of patients. To confirm clinical manifestations of cerebral ischemia and shift in brain efficiency after revascularization it is necessary to use method with adequate resolution and physical parameters to established goals. Planning this exclusively precise surgery neurosurgeon should to solve controversy – to do it in patients with failed CC and CNS compensatory reserves with no chances for significant improving or to convince preserved patients to undergo revascularization.

Keywords: Cerebral ischemia, Brain revascularization, Symptomatic occluded internal carotid artery

EP-0045 [Neurovascular Surgery » Ischemic Disorders]

Comparison of Carotid Endarterectomy and Stenting for Internal Carotid Artery Near-Occlusion

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Background: The benefit of revascularization of internal carotid artery (ICA) near-occlusion and the methods of revascularization are controversial. There has been no comparison between carotid endarterectomy (CEA) and carotid stent (CAS) placement for treating near-occlusion. The purpose of this study was to evaluate the safety of CEA and CAS and compare long-term clinical follow-up.

Method: This retrospective study identified patients who underwent CEA and CAS placement at our institution from 1/2010 to 1/2017. The medical records and imaging studies of patients with symptomatic ICA near-occlusion were reviewed.

Results: 36 patients met the criteria for symptomatic ICA near-occlusion; 24 patients underwent CEA while 12 patients underwent

CAS. All patients had technically successful revascularization of the ICA. All patients underwent 1 year follow up imaging. Both CAS and CEA groups had 17% re-stenosis and 83% vessel maturation (defined as resolution of ICA hypoplasia). Peri-procedure complication rate for CAS was 0% and CEA was 4%. One delayed death in the CAS group occurred due to hear failure.

Conclusion: This represents the largest series comparing CEA and CAS as treatments for ICA near-occlusion. CAS shows similar outcomes in restenosis and vessel maturation rates when compared to CEA. There was no large difference between the two treatments in clinical outcomes. CAS is a revascularization option if the patient is considered high risk for CEA. We believe CAS should be used selectively in this setting depending on the vascular tortuosity, degree of calcification of the near-occlusion, and severity of the ICA hypoplasia.

Keywords: Internal carotid artery, Near-occlusion, Carotid endarterectomy, Carotid stenting

EP-0046 [Neurovascular Surgery » Ischemic Disorders]

A Rare Cause of Ptosis: Cavernous Sinus Meningioma

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Cavernous sinus meningiomas are very rare and often present with neuro-ophthalmological symptoms. Here, we present a rare case who got diagnosed with cavernous sinus meningioma during the etiological evaluation of unilateral ptosis. A 52-year-old woman was admitted to the hospital with a complaint of progressive drooping of her right eyelid which is fluctuating during the day for the last 6 months. There was no significant disease in his past medical and family history. The neurological and ophthalmologic examination was normal except for ptosis in pupil level in the right eye. However, the fatigue test showed a slight progression in the ptosis, there was no obvious response to the ice test. Her hematological and biochemical laboratory findings were within normal limits. Single fiber electromyography findings, serum creatinine kinase levels and anti-acetylcholine receptor antibodies were within normal limits. Several small (<3 cm) lymph nodes were detected in thorax computed tomography. Peroral of pyridostigmine hydrochloride was administered with the preliminary diagnosis of seronegative ocular myasthenia. No medical response has been observed for two weeks, therefore the drug was discontinued. Her cranial magnetic resonance image revealed a mass lesion adjacent to the cavernous sinus and compatible with meningioma. The patient was directed to surgery. In the differential diagnosis of pure ptosis, Horner's syndrome, myasthenia gravis, and blepharospasm come to mind first. In intracranial pathologies, ptosis is frequently accompanied by ophthalmoparesis. We aimed to emphasize the importance of radiological findings besides clinical findings in the etiological evaluation of atypical cases with ptosis.

Keywords: Cavernous sinus, Meningiomas, Ptosis

EP-0047 [Neurovascular Surgery » Intracerebral Hemorrhage] Surgical Treatment of Patients with Nontraumatic Intracerebral Hemorrhage

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Background: One of the most important prognostic indicators influencing the outcome in patients with notraumatic intracerebral hemorrhage (ICH) is the level of consciousness. Analysis of the result of surgical treatment of patients with coma 1 (GCS 6-8).

Method: We conducted analysis of surgical treatment of 40 patients at the ages from 41 to 75. ICH was located in the putamen in 16 cases, thalamus- 4, mixed- 17, lobar- 3. The volume of ICH less than 40 cm³ was in 2 patients, 41-60 cm³ - 9 patients, 61-90 cm³ - 13 patients, 91-120 cm³ - 11 patients, more than 120 cm³ - 5 patients. Open removal (craniotomy) was performed in 18 cases. The external ventricular drainage (EVD) with local fibrinolysis was performed in 8 cases. Minimally invasive removal of ICH using the original device was performed in 18 cases. The device - funnel cannula - which after the special markings introduced into the hematoma cavity. Results of treatment were evaluated in terms of hospital lethality and type of functional outcomes, which used GOS.

Results: The results of treatment were follows: good recovery- 5%, moderate disability- 17.5%, severe disability- 25%, and lethality- 52.5%. Lethality among open operations amounted to 55.6%, EVD - 75%, minimally invasive operations - 44.4%. The results showed that patients admitted in a coma share of unfavorable outcome (severe neurological disorders + death) is quite high and is 75%.

Conclusion: Differentiated surgical approach may appear the necessary reserve, which will improve outcomes in patients with ICH in a coma.

Keywords: Surgical, Treatment, Nontraumatic, Intracerebral, Hemorrhage

EP-0048 [Neurovascular Surgery » Intracerebral Hemorrhage] Minimal Invasive Methods of Treatment of Spontaneous Intracerebral Hematoma

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Background: Spontaneous intracerebral hematoma (SICH) represents one of the major causes of mortality and disability. One of main direction of neurosurgery's development in our days is to elaborate and to apply minimally invasive surgical methods of treatment in order to reduce intraoperative brain damage and to improve postoperative functional outcome. Objective of the study. Evaluation of effectiveness of minimal invasive methods of treatment in SICH comparatively with therapeutic treatment and classic surgery.

Method: A retrospective research was performed on 102 of patients, hospitalized in the IMSP National Institute of Neurology and Neurosurgery during 2010-2013. Some indexes, such as mortality

rate (M), survival rate according to the Kaplan-Meier method and some scales, such as Glasgow outcome scale (GOS), Barthel index (BI), modified Rankin scale (mRS) were used to evaluate primary and secondary outcome.

Results: The patients were classified into 4 groups according to administered treatment. I- therapeutic treatment (n=37), II- classic craniotomy (n=24), III-minimal invasive craniotomy (n=13), IV- puncture and aspiration with use of local fibrinolysis (n=28). On discharging: I – M=67.6%, BI=38.5, GOS=3, mRS=3.7; II – M=41.7%, BI=55.7, GOS=3.5, mRS=3.1; III– M=46.2%, BI=51.4, GOS=3.3, mRS=3.4; IV– M=25%, BI=49.8, GOS=3.3, mRS=3.6. Secondary outcome after one year: I – M=78.4%, BI=91, GOS=4.4, mRS=1.8; II – M=50%, BI=97.8, GOS=4.8, mRS=0.7; III– M=53.8%, BI=93.3, GOS=4.7, mRS=1.0; IV– M=32.1%, BI=78.7, GOS=4.1, mRS=2.2.

Conclusion: The method of puncture and aspiration of hematoma with use of local fibrinolysis showed its effectiveness by improving functional outcome and survival rate.

Keywords: SICH, Minimal invasive methods, Local fibrinolysis

EP-0049 [Neurovascular Surgery » Intracerebral Hemorrhage] Intracranial Hemorrhage in Kidney, Liver and Heart Recipient Patients

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Major hemorrhagic events are associated with significant morbidity and mortality. Intracerebral hemorrhage (ICH) is a perplexing condition with high morbidity and mortality. Treatment is planned on individual basis. A major portion of the injurious process takes place during the hours following the development of hematoma.

Organ transplantation naturally has a critical postoperative period. The complications may involve various systems of the body. A wide variety of central nervous system (CNS) diseases have been reported in the literature. We aimed to find out the incidence of hemorrhage into different compartments of the intracranial cavity in liver, kidney and heart recipient patients. We searched for possible mechanisms leading to this situation

We retrospectively reviewed the medical files of 2524 patients who underwent either renal, liver or heart transplantations at Ankara Hospital of Başkent University during the years 1985 and 2016. The key words “kidney transplantation”, “liver transplantation”, “heart transplantation “intracerebral hemorrhage”, “subdural hemorrhage” and “epidural hemorrhage” were used to find the kidney, liver and heart recipient patients who experienced hemorrhage in different compartments of the intracranial cavity.

Our search revealed that 25 patients have experienced intracerebral hemorrhage (ICH) at different times following kidney, liver or heart transplantation. In this group 20 patients were kidney transplanted, 3 patients liver transplanted and 2 patients were heart transplanted.

Keywords: Transplantation, Intracerebral hemorrhage, Critical care

EP-0050 [Neurovascular Surgery » Intracerebral Hemorrhage] Non-Endoscopic Minimally Invasive Evacuation of Intracerebral Bleeding

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Spontaneous intracerebral haemorrhage has a high disability and mortality rate. In cases, when surgery is needed, minimally invasive approach is recommended. A 59-year old patient was admitted due to progressive left sided arm and leg weakness. The neurological status started to deteriorate quickly. A computed tomography (CT) of the head revealed an ICH of 7 cm in diameter with haematocephalus and cerebral oedema. The CT angiography was negative, classifying the haematoma as a primary one. Coagulation and aggregation values were deranged as a result of liver failure. The international normalised ratio (INR) and prothrombin time (PT) were lowered to 1.56 and 0.47, respectively. The platelet count was 33 and the platelet function tests were completely disturbed. Injections of fresh frozen plasma, recombinant coagulation factor VIIa, protrombin complex, vitamin K and platelet plasma were applied. As a result of extensive intracerebral bleeding and consciousness decline, surgery was recommended despite unfavourable laboratory results. A minimally invasive approach was chosen for the ICH removal. A burr hole of 1 cm in diameter was made in the right temporal area. Under the microscope, the liquefied blood was evacuated with aspirator and bipolar. The ICP values remained normal during the course of treatment. The control CT scan showed successfully evacuated haematoma and normal width of the ventricles. The sedation was gradually discontinued after a week. The patient was awake with persistent left sided haemiplegia. In case of patient with numerous risk factors and imminent operation, minimally invasive surgery for intracerebral haematoma is warranted.

Keywords: Endoscopy, Minimally invasive surgery, Intracerebral haematoma

EP-0051 [Neurovascular Surgery » Intracerebral Hemorrhage] The Prognostic Factors After the Surgical Evacuation of Spontaneous Intracerebral Hemorrhage

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Background: Spontaneous intracerebral hemorrhage is a major health problem worldwide; represents 25% of stroke cases. Risk factors include old age, hypertension, amyloid angiopathy, history of anticoagulant intake and cardiovascular disease. The surgical role remains controversial in the literature and this debate because of possible brain injury occurred during the evacuation. However, surgical evacuation may relieve local ischemia and compression caused by the hemorrhage. The aim of the study is to evaluate the surgical evacuation of the spontaneous intracerebral hemorrhage and to detect factors associated with the best prognosis.

Method: A prospective cohort study of 52 patients developed spontaneous intracerebral hemorrhage aged 2 months to 55 years underwent surgical evacuation in the period between November

2012 and October 2014. All patients underwent surgical evacuation. They were evaluated regarding the degree of hematoma evacuation using postoperative brain CT, then followed up for six months for the functional outcome using modified Rankin score, Glasgow outcome score and mortality rate 3 months postoperatively.

Results: The mean age was (31.3 years). The presentation was disturbed conscious level in (52%), repeated convulsions in (57%) and a neurological deficit in (42%). After surgical evacuation; the survived patients were 28 patients (55%) after 3 months. Thirteen of them (25%) had postoperative morbidity in the form of monoparesis or hemiparesis. Survival associated with many factors as a right sided hematoma, early intervention, the volume of hemorrhage and preoperative Glasgow Coma Scale < 8.

Conclusion: Spontaneous intracerebral hemorrhage in children is mostly due to coagulopathies

Keywords: Spontaneous hemorrhage, Surgical evacuation, ICH (intracerebral hemorrhage), IVH (Intraventricular hemorrhage), ICU (Intensive care unit), GOS (Glasgow outcome scale)

EP-0052 [Neurovascular Surgery » Intracerebral Hemorrhage] Post-Traumatic Intracranial Arterial Aneurysms in Children and Adolescents: About Two Cases and Review of the Literature

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Intracranial aneurysms are very rare in children and adolescents. Post-traumatic aneurysms account for less than 1% of intracranial arterial aneurysms, and are more frequent in the pediatric population. They have been reported after open and closed cranial injuries. The rupture of the aneurysm is the most frequent and also the most dramatic mode of discovery. Imaging is necessary for diagnosis and surgery. We reported two cases of post-traumatic intracranial aneurysms in children and adolescents received in our neurosurgery department at the FANN Hospital in Dakar-Senegal, with surgical treatment by clipping with Coating in one case. The etiological, clinical, radiological, therapeutic and improving aspects were analyzed. The first case was a 15-year-old patient with severe brain injury after a gas bottle was blown up. The angioscanner control performed three weeks after bleeding showed a sacciform pseudo-aneurysm of the third segment of the left anterior cerebral artery. The second case is an 11-year-old patient with a history of child abuse admitted with left hemiparesis and dysarthria, a month after beating. The injected cerebral scan had revealed an aneurysm located on the posterior branch of the left second sylvian segment with a large collar. The prognosis of untreated traumatic brain aneurysms is bleak. Any secondary alteration of the state of consciousness in the child who has undergone a brain injury is an alert factor which should be taken as a pathognomonic sign of the intracranial aneurysm. Negative initial angiography should be repeated especially in patients with severe cranial trauma.

Keywords: Aneurysm, Brain injury, Pediatric, Angiography

EP-0053 [Neurovascular Surgery » Intracerebral Hemorrhage] Effects of Arginine Vasopressin and V1 Receptor Antagonist on Cerebral Vasospasm Secondary to Subarachnoid Hemorrhage: An Experimental Study

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Aim: To examine morphological, radiological and biochemical effects of arginine vasopressin (AV) and AV V1 receptor antagonist cerebral vasospasm (CVS) in rabbit subarachnoid hemorrhage (SAH).

Method: Forty male New Zealand white rabbits were randomly divided to four groups comprising 10 rabbits each. The groups were 1) control, 2) subarachnoid hemorrhage (SAH), 3) SAH+AV application, 4) SAH+V1 antagonist of AV V1 receptor. Diameters of the basilar artery of all the groups were measured on angiograms. All the animals were sacrificed two days following basilar angiography and tissue samples of basilar artery was dissected under microscope after immediate craniectomy for ultra structural and biochemical examination.

Results: The artery diameters were found to be 50% and 50% at the 30th minute in the groups 2 and 3 respectively. In group 3, Cerebral vasospasm (CVS) was 13% more in comparison with the 2nd group. In group 4, vascular constriction was 34.5% at the 30th minute and about 30.9% at the 300th minute. Despite the increase in regional blood circulation, AV did not provide morphologic change. Histologic appearance was related to vascular stenosis due to CVS. Histological outlook was the best in group 4 because of less often CVS.

Conclusion: Arginine vasopressin plays an important role in CVS. We detected morphologic and radiological recovery in basilar artery, besides moderate improvement due to AV receptor antagonist in CVS.

Keywords: Cerebral vasospasm, Subarachnoid hemorrhage, Arginine vasopressin, V1 receptor antagonist

EP-0054 [Neurovascular Surgery » Intracerebral Hemorrhage] Intracerebral Hemorrhage with Cerebral Venous Sinus Thrombosis in Tibetan Population

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Background: Tibetan people have high risk of intracerebral hemorrhage (ICH) as cerebral venous sinus thrombosis (CVST) can

be found in some Tibetan ICH patients. The risk factors of CVST in Tibetans are unclear. Management and clinical outcome of ICH with CVST in Tibetan patients is poorly understood. The main objectives of this study is to describe and discuss the risk factors, clinical characteristics, treatment and clinical outcome in Tibetan patients of ICH with CVST.

Method: The retrospective study was performed in the department of neurosurgery in West China Hospital, Sichuan University from January 2005 to January 2015. All radiologically diagnosed cases of ICH with CVST were included.

Results: A total of 39 patients of ICH with CVST were enrolled, including 18 Tibetan patients. ICH with CVST accounted for 2.19% in Tibetan ICH patients. Red blood cell (RBC) count ($P=0.029$) and hemoglobin (HGB) ($P<0.001$) were significantly higher in Tibetan patients. One week after decompressive craniectomy, the mean Glasgow Coma Scale (GCS) score was 5.40 ± 2.27 in all patients and 4.75 ± 2.06 in Tibetan patients. The mean 6-month modified Rankin Scale (mRS) score was 2.05 ± 1.96 in Han population and 2.46 ± 2.30 in Tibetan population ($P=0.592$).

Conclusion: ICH with CVST is more frequent in Tibetan population. The levels of RBC and HGB are significantly higher in Tibetan patients. Although the postoperative GCS is lower, the decompressive craniectomy can improve GCS in Tibetan patients. The 6-month mRS score tends to be higher in Tibetan patients. It is still uncertain if Tibetan patients of ICH with CVST have poorer clinical outcome.

Keywords: Intracerebral hemorrhage, Cerebral venous sinus thrombosis, Tibetan population, Treatment

EP-0055 [Neurovascular Surgery] Intracerebral Hemorrhage] Acute Onset of Paraplegia and Bladder Disturbance: A Misleading Presentation of Bilateral Chronic Subdural Hematoma

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Background: Chronic subdural hematoma (CSDH) is one of the most common diseases in the neurosurgical field. The most presenting features are symptoms of altered mental status, headache, hemiparesis, seizures and extrapyramidal symptoms.

Method: Here, we present an exceptional case of a 62-year-old male presenting with paraplegia and bladder disturbance secondary to bilateral CSDH. We review the literature and discuss the probable underlying physiopathologic mechanisms contributing to this presentation.

Results: A 62-year-old male presented to our hospital with a three days history of rapidly progressive weakness of both legs and urinary incontinence. Neurological examination revealed severe weakness of both legs that was rated as 1/5 on manual motor testing and diminished planter reflexes. There was no motor deficit in the upper limbs. Meticulous examination did not demonstrate any sensory abnormalities. In the absence of sensory impairment on examination and spinal cord compression on MRI, an intracranial lesion suspected. The CT scan of the brain showed a bilateral non hemispheric CSDH involving the fronto-parietal regions. No

midline shift was noted. Under local anesthesia, bilateral burr-hole operation was performed to evacuate the subdural hematomas. Two hours post-operatively, he reported that his legs felt stronger. Within 24 hours he was able to hold his urine and to walk without assistance.

Conclusion: Non hemispheric bilateral CSDH should be added to the differential diagnosis of Spinal cord compression in patient with paraplegia and bladder disturbance.

Keywords: Hematoma, Subdural, Paraplegia, Surgery

EP-0056 [Neurovascular Surgery] Intracerebral Hemorrhage] The Effectiveness of Early External Ventricular Drainage at Patients with Hypertensive Intraventricular Hemorrhage

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Background: Intraventricular extension occurs in 30%–45% of patients with hypertensive ICH and is strong predictor of poor outcome. During the first year 60-80% of patients die, and more than half of survivors are permanently disabled. The purpose of the research is to evaluate the efficiency of early external ventricular drainage (EVD) at patients with ICH with intraventricular extension.

Method: We have analyzed case histories of 22 patients with diagnose of ICH with intraventricular extension at the Namangan branch of Republican Scientific Center of Emergency Medicine from 2012-2016y. The patients' age ranged from 42 to 68 years, average 62 years old. Among them 9 men, 13 women. All patients were fully examined, neuroophthalmic, neurophysiological, neuroimaging methods were carried out. The general condition of patients was assessed by standard Hunt-Hess classification. Indications for EVD were small volume (up to 30 cm³) ICH with intraventricular extension, presence of clinical progressive occlusive hydrocephalus, the absence of decompensated dislocation syndrome. To all patients performed emergency surgery to remove the ventriculartamponade. In order to prevent secondary infection, drainage tubes withdrawn through contra aperture at least 10-15 cm from the surgical wound.

Results: Improvement of a condition of patients during the early postoperative period is noted in 86.3% patients. Postoperative CT monitoring also confirmed the fact of recourse of intensity of hydrocephalus process and reduction of sizes of ventricles, resorption and sanitization of intraventricular blood clot. Lethal outcome occurred in 13.6% patients.

Keywords: External ventricular drainage, Intraventricular hemorrhage, Hunt-Hess classification

EP-0057 [Neurovascular Surgery] Intracerebral Hemorrhage] Angiographic and Clinical Factors Related with Good Functional Outcome After Mechanical Thrombectomy in Acute Cerebral Artery Occlusion

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Background: Acute occlusion of major cerebral artery is associated with high mortality and morbidity. Few data are available about prognostic factor of good outcome although mechanical thrombectomy has significantly advanced over the last 5 years. The aim of this study is to investigate good prognostic factor of mechanical thrombectomy.

Method: A single center retrospective analysis of 37 consecutive patients with acute occlusion of major cerebral artery, treated by mechanical thrombectomy with stent retrievers. Collateral was assessed by the Thrombolysis in Myocardial Infarction (TIMI) and recanalization was by the Thrombolysis in Cerebral Infarction (TICI) score. Outcome was assessed by National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS) at 90-day.

Result: Most patients (27/37) demonstrated a good recanalization (TICI 2b or 3) after thrombectomy. At 90-day follow up, 19 patients had good outcome (mRS 0 to 2), 14 had moderate (mRS 3-4) and 6 had poor outcome (mRS 5-6). Early recanalization, high TIMI and low baseline NIHSS were closely related to 90-day mRS while high TICI related to both mRS and decrease of NIHSS.

Conclusion: NIHSS decreased markedly when recanalization is successful. Good mRS was related to low initial NIHSS, good collateral, early and successful recanalization.

Keywords: Acute cerebral artery occlusion, Mechanical thrombectomy, Prognosis, Functional outcome

EP-0058 [Neurovascular Surgery] Intracerebral Hemorrhage] Postpartum Hemorrhagic Stroke- Early Intervention in Selected Cases May Save Life

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Postpartum hemorrhagic stroke is a comparatively rare entity but its incidence is increasing day by day. In a US government supported study, it has been found that the incidence is increased about two-fold from 1994-1999 period to 2008-2011 period. But no such data is available in our perspective. During the last two years period (2015-2016), 5 patients of postpartum hemorrhagic stroke were treated in different hospitals in Chittagong. The results of early surgery, late surgery and conservative management were analyzed and it is evident that outcome of early surgery is better.

Keywords: Postpartum, Hemorrhagic stroke, Early surgery

EP-0059 [Neurovascular Surgery] Intracerebral Hemorrhage] Subdural and Subarachnoid Hemorrhage After Cesarean Section Under Spinal Anesthesia

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It has been reported that complications of spinal anesthesia includes; headache, urinary retention, transient neurological symptoms, high/total spinal anesthesia, cardiac arrest, systemic toxicity, cauda equina syndrome and other neurological deficits. The most common complication is headache however co-occurrence of subdural and subarachnoid hemorrhage together with spinal anesthesia is very rare. A 25-year-old female patient complained of severe headache

and neck pain at the anterior part of the head on the 2nd day after C/S with spinal anesthesia. On the 6th postoperative day, there was numbness and muscle weakness on the left side. There were no signs of meningismus, however non-contrast-CT detected subarachnoid hemorrhage in the right cerebral convexity and subdural hemorrhage with a thickness of 4mm on the right temporal lobe. Complications of spinal anesthesia include hypotension, post-dural-puncture headache, meningitis, spinal hematoma, reversible sensory loss and paraplegia. Differential diagnosis of severe headache associated with pregnancy and dural puncture requires broad-spectrum including preeclampsia, migraine, and other intracranial pathologies. The severity or prolongation of the post-dural-puncture headache may be a sign of subdural hematoma or intracranial hemorrhage. Tension and disruption of the cerebral bridge venules during the sudden loss of CSF and displacement of the brain to the caudal can lead to intracranial subdural hematoma. Cranial imaging should be performed and patients should be closely monitored in the prolonged headache after spinal anesthesia. This case was considered worthy of presentation because of the extremely rare occurrence of subdural and subarachnoid hemorrhage together with spinal anesthesia.

Keywords: Subarachnoid hemorrhage, Subdural hematoma, Spinal anesthesia

EP-0060 [Neurovascular Surgery] Intracerebral Hemorrhage] Posterior Fossa ICH – Far More Benign Than Its Supratentorial Equivalent but with the Same Operative Candidate Selection Dilemma

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Background: Posterior fossa ICH represents a significantly rarer entity compared to supratentorial ICH. It usually is a more challenging diagnosis and reaches the neurosurgeon later, except the most severe cases. But is it better to Operate? or not? And when?

Method: We have analyzed our series of 15 operated Posterior fossa ICH patients, and we are comparing with our own series of 48 supratentorial ICH and 9 Non-operated Posterior fossa ICH patients.

Results: The infratentorial ICH subgroup A (Mean age = 64.3 yrs, 60% males) had a survival of 87% and Mean GOS = 4.1. The supratentorial ICH subgroup B (Mean age = 61.3 yrs, 62% males) had a survival of 67% and Mean GOS = 3.3. The Non-operated infratentorial ICH Subgroup C (Mean age = 78.5 yrs, 62% females) had a survival of 81% and Mean GOS = 4.3.

Conclusion: Infratentorial ICH is a far more benign entity. Both survival rates and especially GOS results are excellent. On the other hand it is to be noted that the results themselves would be similarly better with conservative treatment and that waiting and observing has an increased chance of evading surgery than with supratentorial. And although the risk of more acute deterioration is higher, it can usually be counterweighted by placement of an EVD. Thus, operation is especially recommended for younger severely affected patients with lower perioperative risks. It is a technically

more demanding operation, but definitely worth it and a very good training for the medium to senior level registrars.

Keywords: Infratentorial, Posterior fossa, ICH, Decision

EP-0061 [Neurovascular Surgery » Intracerebral Hemorrhage] Subarachnoid Cerebrospinal Fluid Space Breaching in Surgical Drainage of Chronic

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Background: Chronic subdural hematoma (CSDH) is a common neurosurgical problem especially in elderly, yet there has been relatively little progress in its treatment. To evaluate the effect of subarachnoid breaching allowing cerebrospinal fluid (CSF) flow into the subdural space after burrhole drainage of CSDH on absorption of air, and incidence of postoperative recurrence.

Method: The study included 37 patients with mean age were 63 years (range 23 to 79). An average hospital stay was 10 days. There were history of trauma in 23 cases, anticoagulant therapy in 7 cases for cardiac reasons, chronic liver disease in 4 cases, and renal failure in 3 cases. Follow up period was one year. Patients were assessed for air related complications, recurrence and preoperative symptoms.

Results: No operative or air related complications were seen. There were two cases of mortality due hepatic encephalopathy. CSF collection was seen in 10 patients and resolved spontaneously. There were three cases with CSF leak controlled by re-suturing of the drain exit site. Intraoperative excessive extradural bleeding occurred in one case developed after the evacuation of hematoma and controlled by increasing the burr-hole size with extradural drain left. All patients with neurologic deficits improved either during stay or on follow up visits.

Conclusion: Surgical drainage of CSDH with Puncture of subarachnoid space to get free flow of CSF into the subdural space helps for internal wash of residual blood, rapid absorption of postoperative air and prevents short term recollection. The technique is safe and effective.

Keywords: Subdural, Hemorrhage, Chronic subarachnoid

EP-0062 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Microsurgical Resection of an Occipital Arteriovenous Malformation: Case Report

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Cerebral arteriovenous malformations (AVMs) are complex high-flow lesions whose management often requires a multidisciplinary team. The microsurgical resection of the malformation with or without embolization remains the only treatment that ensures a permanent cure. A 22-year-old male without a significant past medical history was evaluated with MR-Angiography (MRA) because of frequent unusual episodes of seizures for the past 6 months. MRA revealed a right occipital AVM that was classified as a Spetzler-Martin Grade I AVM. The patient underwent

microsurgical treatment with total removal of the malformation. Postoperatively, we noticed the disparition of seizures without any medical treatment. The decision of a surgical management of cerebral AVM is not easy to take and requires a collective discussion with neurosurgeons, radiotherapists and neuroradiologists. Microsurgery allows the total resection of the malformation without causing neurological damage especially in highly functional areas. The surgical management of cerebral AVMs requires a neurosurgeon with a great and long experience in vascular surgery.

Keywords: Microsurgery, Arteriovenous malformation, Vascular

EP-0063 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Usefulness of Trans-Surgical Doppler Ultrasound Pre- and Post-Clipping of Brain Aneurysms Assisted with Neuronavigation

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Background: The Doppler ultrasound (US) allows the non-invasive study of blood flow parameters in the proximal portions of the vessels that form the polygon of Willis, this transoperative diagnostic technique, with real-time flow measurement, is useful to optimize the clipping of the aneurysms.

Method: Philips 32-cut tomograph and 3D reconstruction, Three-dimensional Ultrasound sonowand Neuronavigator were used. An ultrasonographic study was performed in 7 patients with cerebral aneurysm - 4 females and 3 males, ranging in age from 45 to 60 years. Surgical intervention from day 4 to 15 of the hemorrhagic event. Transcranial transcranial Doppler Ultrasound was performed in real time, guided by navigation, vascular flow was assessed on the neck and aneurysmal dome, proximal and distal artery to the aneurysm. The clipping will be corroborated, as well as flows before and after the placement of the clip on the aneurysmal neck. The clipping was corroborated 24 h after surgery by means of angiotomography as a control.

Results: In the seven cases, the distal permeability of the arteries was observed, as well as 100% exclusion of the post-clipping aneurysm according to cerebral angiography.

Conclusion: The usefulness of transsurgical US Doppler in patients submitted to aneurysm clipping is a diagnostic, noninvasive diagnostic method with high sensitivity and specificity that allows real-time verification of the adequate placement of the clip on the aneurysm neck and reduces the risk of myocardial infarction Post-surgery, and residual aneurysm reintervention

Keywords: Doppler, Clipping, Brain aneurysms, Neuronavigation

EP-0064 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Ethmoidal Type Dural Arteriovenous Fistula Associated with Multiple Intracranial Aneurysms: An Case Report and Review of the Literature**

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Ethmoidal type dural arteriovenous fistula (DAVF) accompanied by intracranial aneurysms is an extremely rare situation. A 37-year-old man presented with sudden loss of consciousness for about half an hour. Computed tomographic scan of the brain showed subarachnoid hemorrhage. Angiogram revealed anterior communicating artery (ACoA) and left internal carotid artery (ICA) bifurcation aneurysms. In addition, a DAVF located in the anterior cranial fossa was also found. We decided that the ruptured aneurysm was left ICA bifurcation aneurysm. Firstly, we treated ruptured ICA bifurcation aneurysm by coil embolization. Secondly, 1 month later, we concomitantly treated the DAVF of the anterior cranial fossa and unruptured ACoA aneurysm with microsurgery via subfrontal-interhemispheric approach in single stage. After an uneventful postoperative course, the patient was managed nonoperatively and discharged with close follow-up. An unusual case of anterior cranial fossa DAVF associated with a ruptured ICA bifurcation aneurysm and an unruptured ACoA aneurysm is reported. We feel special consideration may be required in deciding the priority of treatment in such cases.

Keywords: Dural arteriovenous fistula, Anterior cranial fossa, Cerebral aneurysm

EP-0065 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Intraoperative Videoangiography in Vascular Neurosurgery**

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Background: Intraoperative video angiography is recently developed and being widely used for confirming patency or exclusion of blood flow during vascular neurosurgery. We report our experiences with use of intraoperative video angiography and compare the fluorescein video angiography (F-VA) with indocyanine green videoangiography (ICG-VA).

Method: From March to December in 2016, 119 patients who underwent vascular neurosurgery following intraoperative ICG-VA or F-VA are included in this report. Retrospectively, we reviewed records, radiographs, and surgical microscopic videos. 112 patients underwent aneurysm clipping and 7 patients underwent removal of arteriovenous malformation (AVM) or dural arteriovenous fistula (DAVF) following ICG-VA or F-VA to confirm appropriate clipping or detect AVMs.

Results: Compared to ICG-VA, F-VA could be performed almost once during a neurosurgery due to slow clearance. But it offers better images to define small vessels and manipulation is possible simultaneously with inspection. After ICG-VA, the rate of

significant changes in surgical decision by F-VA is 4.5% (11 of 112) in aneurysmal clipping surgeries.

Conclusion: We suggest that videoangiography should be a routine intraoperative evaluation tool for better outcome of neurovascular surgery including aneurysm clipping, AVMs, DAVFs, etc. But correlation with intraoperative Doppler sono, neuromonitor and post-operative imaging is still needed. F-VA should be considered as a complementary evaluation tool rather than ICG-VA alone.

Keywords: Videoangiography, Aneurysm, Vascular neurosurgery, Indocyanine green, Fluorescein

EP-0066 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Syncope as a Presenting Symptom of Multiple Intracranial Cysts**Dilcan Kotan¹, Asli Aksoy Gundogdu², Pinar Polat³*(1) Sakarya University, Faculty of Medicine, Department of Neurology, Sakarya, Turkey, (2) Department of Neurology, SB Sakarya University Education and Training Hospital, Sakarya, Turkey, (3) Department of Radiology, Medipol University Medical Faculty, Istanbul, Turkey*

Venous angiomas are the rare forms of intracranial vascular malformations. They frequently cause a headache or they may be asymptomatic and found incidentally. Here we present a male patient with multiple intracranial cysts with frontal venous angioma and a mural cystic nodule in pons as a rare area of involvement. A 26-year-old male patient presented to our clinic with his first brief syncope attack, not accompanied by contractions. He had a 4 months history of worsening headache. His past medical history, family history, and his neurological examination revealed no pathological finding. His hematological and biochemical laboratory findings were within normal limits. His electroencephalogram (EEG) was normal. His cranial magnetic resonance image (MRI) revealed a cystic venous angioma lesion with a solid component and without contrast enhancement in the right frontal area and pons, suggesting a mural nodule. A venous angioma is proposed as the major cause of the syncope. The patient had undergone 2 years follow-up with symptomatic treatment. In 2 years time, there was no improvement in the lesions of the patient. Therefore, the lesion was evaluated as benign vascular anomalies. Mural cystic nodules may result from the venous origin and rarely locate in the brain stem. There are a limited number of cases has been reported in the literature. It is important to detect the appropriate cases for surgical approach and to decide the long-term follow-up without surgery. Our case emphasizes the importance of neuroradiological imaging in the differential diagnosis of symptomatic multiple intracranial cysts.

Keywords: Venous angiomas, Intracranial cysts, Syncope

EP-0067 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Management Strategy and Treatment Outcomes of Unruptured Intracranial Aneurysms**Akio Morita¹, Shinjiro Tominari²*(1) Nippon Medical School, Japan, (2) Ucas Japan Investigators*

Background: Management of the unruptured intracranial aneurysms (UIA) should be decided balancing rupture risk and management risk of aneurysms as well as patient's physical and mental conditions. Rupture risks and its prediction models of UCA have been recently reported, but management risks need to be further clarified. We now report the treatment data from a Japanese cohort and created risk prediction model in conjunction with rupture risks in this cohort.

Method: Out of the total cohort of 6,413 patients, 2,627 underwent repair (2,311 by open craniotomy) in 215 institutions. Morbidity was defined as decline of modified Rankin scale at one month after treatment. Factors with p value less than 0.10 by multivariate cox regression model were considered important and included in the prediction model for management morbidity. Prediction scores were derived from multivariate hazard ratio.

Results: Overall morbidity was recorded in 79 cases (3.0%). Important risk factors were as follows; Size ≥ 10 mm, basilar location, not associated with daughter sac, Age ≥ 70 years, hypertension, diabetes mellitus, initial modified Rankin scale and multiple aneurysm treatment at one session. Neither hospital treatment volume nor method of treatment affected treatment morbidity. We created risk prediction model for morbidity to be balanced with rupture prediction score.

Conclusion: Risks associated with management of UIA can be stratified with several factors. Risk prediction model of management as shown here should support decision making on UIA management in conjoined with rupture risk prediction model.

Keywords: Unruptured intracranial aneurysms, Management, Prediction model, Morbidity, Rupture

EP-0068 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Microcephalic Osteodysplastic Primordial Dwarfism Type II (MOPDII) with Posterior Communicating Artery Aneurysm, 10 Years Follow Up; Case Report

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MOPDII is a rare genetic disorder caused by mutations on the pericentrin gene. It is characterized by small stature and microcephaly. The leading causes of morbidity and death in these patients are aneurysmal subarachnoid hemorrhage and stroke. This report presents a MOPDII case operated for ruptured cerebral aneurysm and discussed the characteristic features and its association with vascular pathology. An 18-years old male with MOPDII genetic disorder presented with the complaints of headache, nausea, vomiting and somnolence. On neurological examination his consciousness was slightly drowsy. Cranial CT identified a 5x5 cm intracerebral hematoma in the left temporal region. Cerebral DSA identified bilobular aneurysm in the left posterior communicating artery. His aneurysm was clipped microsurgically. The patient was neurological intact and had no additional cerebral vascular pathology during 10 years follow-up. It is not clear whether cerebrovascular lesions related to MOPDII

are present from birth or occur in the early period of life. The majority of cases occur in the pediatric population and appear to display a progressive course. In patients with small stature, especially with clinical properties accompanied by vascular complications, MOPDII should be considered. After identification of mutations on the pericentrin gene, they should be analyzed for vascular abnormalities to begin prophylactic treatment. Frequent screening should continue from the early period and may prevent destructive effects of cerebrovascular diseases. At the same time, it may be beneficial to our understanding of the natural progression of cerebrovascular pathologies in these patients.

Keywords: Microcephalic osteodysplastic primordial dwarfism type II, Intracranial neurysm, Subarachnoid hemorrhage

EP-0069

Association Between Cerebral Aneurysm and Meningioma. 3 Cases Reports

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Background: The association between intracranial aneurysms (AN) and brain tumors is relatively rare. Meningiomas are the most frequently tumors associated with aneurysms. The literature presented an incidence of 0,3 to 0,7%. With the advent of neuroradiological techniques such as magnetic resonance imaging (MRI) and magnetic resonance angiography, it is increasing possible to related those pathology's association. The treatment decision should consider the treatment of both lesions. The objective of the present study is to demonstrate 3 patients whose where found the association between intracranial aneurysm and meningiomas, discuss physiopathological aspects as well the therapeutic strategy.

Methods: In the current study, we present 3 cases of female patients with the diagnosis of meningioma and cerebral aneurysm, And also, we will review the physiopathogenic aspect.

Results: Although rare, an association between meningioma and NA has been reported in the literature, and female has a higher incidence. In females with a hormonal pathophysiology to justify a genesis of lesions, where the arachnid, from which the meningiomas originate, the middle layer of the arteries, from which the aneurysms originate, has the same embryonic origin and, therefore a disbrigenesis could be co-administered twice.

Conclusions: The association of meningioma and cerebral NA is rare. Performing MRI and angioRM is very important. Treatment, whenever possible, should include resection of the meningioma and clipping of the aneurysm, at the same time.

Keywords: Meningioma, Aneurysm, Disbrigenesis, Tumor

EP-0070 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Cavernous Malformation of the Cerebral Peduncle Treated via a Fronto-Temporal Orbito-Zygomatic Craniotomy and a Combined Transsylvian-Pretemporal Approach: A Case Report**

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Midbrain cavernous malformations (MCM) are rare brain lesions affecting mostly young individuals that are usually diagnosed after their rupture. The choice of safe approach to this part of the brain stem requires the knowledge of safe entry zones and the use of the tailored skull base craniotomies. We describe a case of a successful treatment of a MCM through the pericolumotor zone using a fronto-temporal orbito-zygomatic (FTOZ) approach. 24-year-old female presented to our department 3 weeks after a sudden onset of diplopia and left-sided hemiparesis 1 year after her third pregnancy. Magnetic resonance imaging (MRI) showed a mixed signal from the chronic and subacute hemorrhage in the ventro-medial aspect of the right cerebral peduncle. MRI tractography revealed a laterally displaced right corticospinal tract and a brain-stem portion of the right oculomotor nerve (ON) located medially to the lesion. The MCM was exposed through the FTOZ-craniotomy and a combined transsylvian-pretemporal approach. A 1 mm encephalotomy was performed just lateral to the ON exit zone. The cavernoma with surrounding hematoma and its capsule were totally removed in a piecemeal fashion. Post-operatively the patient regained full muscular strength in her left extremities. A transient right ON palsy slowly resolved within 2 months. The meticulous preoperative planning including high-resolution contrast-enhanced MRI with tractography, judicious use of FTOZ approach and minimally disruptive intradural routes through the "safe" entry zones of the midbrain help in reducing morbidity and facilitate the total removal of MCM.

Keywords: Brain stem cavernoma, Microsurgical technique, MRI-tractography, Skull base approach, Safe entry zone

EP-0071 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Possibility of Preventive Induced Hypertensive Treatment for Reduce Symptomatic Vasospasm in Aneurysmal Subarachnoid Hemorrhage**

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Aim: To present the clinical results of preventive induced hypertensive treatment (PIHT) to reduce symptomatic vasospasm and delayed cerebral ischemia in selected patients suspected to symptomatic vasospasm after aneurysmal subarachnoid hemorrhage.

Method: PIHT was initiated in patients, the transcranial Doppler

ultrasound was superior to a mean velocity of 160 cm/sec and angiographic arterial narrowing more than 30% compared to the initial angiogram. PIHT was made through increasing mean arterial blood pressure (mABP). The mABP target was increased to 5 to 10mmHg compared to initial blood pressure. The endpoint was the incidence of symptomatic vasospasm, delayed cerebral ischemia, and PIHT related complications.

Results: Nineteen six patients were included in this study. In nine patients (9.5%), TCD indicated an increase in the blood flow velocity to ≥ 160 cm/sec and angiographic vasospasm was observed. PIHT was performed in these patients. Transient symptomatic vasospasm occurred in one case. However, there was no occurrence of delayed cerebral ischemia or medical complications after PIHT.

Conclusion: PIHT could reduce the occurrence of symptomatic vasospasm and DCI without increasing medical complications in selected cases.

Keywords: Subarachnoid hemorrhage, Vasospasm, Ischemia, Hemodynamics

EP-0072 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**De Novo Cavernoma Formation on a Patient with Familial Cerebral Cavernomatosis**

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Cavernous malformations (CM) are vascular neoplasms that aren't observed on angiographs, which constitute approximately 10-20% of cerebrovascular pathologies. There are articles about CM may be congenital or acquired. We mentioned about a case who underwent surgery for familial cerebral cavernomatosis (FCC) and de novo cavernoma formation on follow-up. 21-year-old male with family history of FCC was presented by convulsion and identified multiple cavernoma centers on left frontal and right temporal lobe. Left frontal one was determined the cause of seizure and excised. On the first year control MRI a new, 1 cm size cavernoma was observed in the deeper portion of left temporal lobe, adjacent lateral ventricle, that wasn't observed on previous MRI. In 1.5 years follow up, cavernoma size increased from 1 cm to 2.5 cm and therefore surgery was performed. Pathology confirmed that lesions were cavernoma. Approximately 30-50% of cavernomas are familial and 50-80% of multiple cavernomas (MC) are in the familial group. CM are thought to be congenital lesions. However, in some familial cases, new lesions was seen subsequently. It is also said that de novo CM are more related to familial types. Studies about radiation exposure and vascular growth factor, also suggest that a number of factors may be involved in the formation of acquired CM. Endothelial proliferation and focal hemorrhage are thought to lead to the growth of de novo cavernomas. Because of the rare occurrence of de novo cavernomas, we would like to present our case to the literature.

Keywords: De novo cavernoma formation, Familial cavernomatosis, Multiple cavernoma

EP-0073 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Early Surgical Outcome of Intracranial Aneurysms Clipping in Neurosurgery Department Lady Reading Hospital Peshawar**

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Aim: To know about early surgical outcome of intracranial aneurysms clipping in neurosurgery department lady reading hospital Peshawar.

Method: Study was based on prospective design and approved by the Research Ethics Committee of Lady Reading Hospital Peshawar, the study was conducted in neurosurgery department from June 2011 to June 2016 with total of 5 years duration. Documentation was started from the hospital charts and operative records of all those cases who were operated in our department for intracranial aneurysms were included in this study while patients who were operated for brain arteriovenous malformations and other lesions of the brain and spine were excluded.

Results: Total 87 patients which were operated through pterional approach were included in this study in which females were 56(64.37%) while males were 31(35.63%) with female to male ratio was 1.81:1. All the patients were in the age range of 12 to 80 years with mean age 38 ± 5 SD. The most common aneurysm was anterior communicating artery aneurysm having 49 (56.32%) followed by right side middle cerebral artery aneurysm with 14(16.1%) while minimum cases were due to right side anterior cerebral artery aneurysm having 1(1.15%). 76 (87.36 %) patients were discharged to the home without any complaint post operatively while 5(5.74%) patients were discharged with added neurology. mortality was documented in 6(6.9%).

Conclusion: Intracranial aneurysms are common in middle age females and commonest one based on location is anterior communicating artery aneurysm. Clipping is gold standard if the surgeries are performed by experienced hands.

Keywords: Intracranial aneurysms, Clipping, Anterior communicating artery

EP-0074 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Intracranial Dural Arteriovenous Fistulas. Surgical or Endovascular Treatment. Where are We Now?**Jose Zanon Yada¹, Alexander Guerrero¹, Gustavo Foa Torres²*(1) Salvadorian Neurosciences Institute, El Salvador, (2) Oultun Neuroradiological Center of Cordova, Argentina*

Dural arteriovenous fistulas are abnormal passages between branches of dural arteries and dural veins or a venous sinus. Digital subtraction angiography remains the gold standard to diagnose these fistulas. Endovascular more than surgical treatment prevails as one of the first line options available for their management. This review includes etiopathogenesis, natural history, standardized classifications and my experience about available treatment options.

Keywords: Embolisation, Surgical treatment, Dural arterio-venous fistula

EP-0075 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**May-Thurner Syndrome Associated with Spine Arteriovenous Malformation (AVM): Case Report**

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May-Thurner Syndrome is a rare condition in which the left iliac vein is compressed by the right iliac artery, leading to venous stasis, varicose veins and eventually deep venous thrombosis of the lower limb. Here we present a case of sudden paraplegia after endovascular treatment of varicose veins. The patient was referred to our clinic for further investigation and complementary treatment. Complementary investigation showed May-Thurner syndrome and MRI revealed arteriovenous malformation extending from T5 to L1, with associated spinal edema. Microsurgical emergency treatment was performed with complete excision of the lesion. Neurological recovery, although slow, was progressive and successful. Case report presented, we observed a sudden onset of severe neurological deficit with a clearly vascular character and a clear temporal relationship with the hemodynamic change promoted by the placement of stents in the iliac vein. The authors suspect that this abrupt change had repercussion on the venous regimen of the spinal region, altering the spinal perfusion pressure which should already be borderline due to the presence of AVM extending from T7 to L1. After the microsurgical treatment and reestablishment of the medullary microcirculation, the neurological function of the patient returned, corroborating the hypothesis that the sudden deficit was established due to hemodynamic changes of the medullary circulation. To date, there is no association between these two rare pathologies.

Keywords: May-Thurner syndrome, Spine, Arterio-venous malformation

EP-0076 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Hybrid Treatment of Arteriovenous Malformation**Ilker Deniz Cingoz¹, Murat Sayin¹, Volkan Cakir², Murat Atar¹, Ceren Kizmazoglu³, Nurullah Yuceer¹*(1) Department of Neurosurgery, Katip Celebi University Research and Training Hospital, Izmir, Turkey, (2) Department of Radiology, Katip Celebi University Research and Training Hospital, Izmir, Turkey, (3) Department of Neurosurgery, Dokuz Eylul University, Izmir, Turkey*

Aim: To present hybrid treatment of cranial arteriovenous malformation (AVM) in our hospital.

Method: We retrospectively reviewed 5 cases which had treated with arteriovenous malformation between 2015-2016 at Katip Çelebi University Atatürk Training and Research Hospital. 3 cases was supratentorial and 2 was infratentorial. There were 4 male and 1 female. The age range was 37 to 61 years, with a mean age of 40.56 years. 4 patient presented with headache and 1 patient with seizure. Two patient were grade 2, other two patient grade 3 and the last one grade 4 according to Spetzler-Martin preoperative risk evaluation.

Results: All patients underwent firstly with endovascular embolization and then, totally excised with surgery. Subdural

hematoma was observed in one of these cases. the patient was stayed in intensive care unit during postoperative period and died after 4 months. 3 patients discharged with a Glasgow Outcome Score 5 and 1 patient with 4.

Conclusion: AVM treatment consists of microsurgery, radiosurgery and endovascular surgery according to patient lesion. Despite the fact that surgical excision plays a major role in the treatment, the development of catheter and embolization materials has increased the importance of endovascular treatment in AVM treatment.

Keywords: Arteriovenous malformation, Endovascular embolization, Hybrid, Microsurgery

EP-0077 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Giant Vertebrobasilar Aneurysm in a 52 Year-Old Man: Case Report

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Giant vertebrobasilar dissecting aneurysms are rare and come as an unexpected diagnosis most of the times. There is no clinical evidence regarding optimal management. We report a rare case of giant vertebrobasilar aneurysm in a 63 year-old man with an unusual presentation. In addition we discuss the pathogenesis of such condition with the relevant literature concerning its treatment and outcome. A 62 year-old man presented with headache and refractory dizziness for the past twelve days. His medical history is significant for pheochromocytoma for which he was operated one and a half year ago and balanced high blood pressure. Neurological examination disclosed a hyperreactive deep tendon reflexes in both lower and higher limbs. MR angiography and conventional angiography revealed a compressive giant vertebrobasilar aneurysm for which no endovascular treatment was decided. The reported case demonstrates a rare condition of brain stem compression due to a giant vertebrobasilar artery aneurysm. Its diagnosis is given by non invasive and invasive investigations. Multidisciplinary team approach is advocated but till now the optimal management is still pending.

Keywords: Neurovascular, Aneurysm, Vertebrobasilar

EP-0078 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Factors Affecting the Surgical Outcomes of Multiple Cerebral Aneurysms: A Prospective Study

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Background: Multiple cerebral aneurysms (MCAs) are fairly

common entities that are often asymptomatic until the time of rupture. To find the factors affecting the surgical outcomes of MCAs by evaluation the surgical outcomes of 90 consecutive cases.

Method: Medical records of 409 consecutive cases of cerebral aneurysms who were underwent surgery in our hospital, during a 3-year period from 2011 till 2013 were prospectively collected. Only cases with MCAs (n=90) that diagnosed and surgically treated are included in this study. All patients underwent a craniotomy then microsurgical clipping all aneurysms had been reached. The aneurysms not appropriate for clipping were warped or sent for embolization.

Results: The mean age of the sample is 50.79±11.94 years. There are 67 patients presented with subarachnoidal hemorrhage. Mortality rate is 13.3% (n=12). Morbidity rate is 18.8% (n=17). Seven out of those seventeen were partially or completely dependent on others for daily living activities before surgery. 67.8% (n=61) of the patients were returned to normal their job and daily activities at their last follow-up (52.3 months on average). History of coronary artery diseases and worsening neurological grade on presentation (Hunt-Hess grade IV/V) are selected as the independent risk factors associated with increasing morbidity and mortality in MCAs (OR 18.46, P=0.007); (OR 30.0, P=0.002) and (OR 0.06, P=0.0001); (OR 0.07, P=0.002), respectively.

Conclusion: History of coronary artery diseases and high Hunt-Hess grade are selected as the independent risk factors associated with poor surgical outcomes of MCAs patients. Further prospective studies are necessary to investigate these findings systematically.

Keywords: Clipping microsurgical, Coronary artery diseases, Hunt-Hess scale, Multiple cerebral aneurysm, Subarachnoid hemorrhage

EP-0079 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Treatment of Multiple Aneurysms in Limited Conditions

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Multiple cerebral aneurysms present a wide variation in incidence with averages of 13% at angiographic studies and 22.7% at autopsy. We present the patient 57-year-old female, heavy smoker, presenting with sudden onset of severe excruciating headache followed by vomiting episodes. She was admitted 2 days after the symptomatology onset. Her clinical exam revealed drowsiness, neck stiffness, and visual disturbances. A clinical diagnosis of subarachnoid hemorrhage, Hunt and Hess grade II-III was made. CT-angiography revealed SAH and two saccular aneurysms, First aneurism located at the AComA, 6 mm in diameter, and the second rested at the bifurcation of the right M1 with M2, with a diameter of 7 mm. In limited conditions in our country, unfortunately the endovascular procedures are not performed yet, we planned to clip both aneurysms in the same session. After the preoperative preparation and standard investigation the patient was operated the next day. The right pterional approach was performed. In our case we could not predict for sure which aneurysm has bled. Since we were planning to clip first proximal aneurysm – AComA. But, during

the dissection of A1 suddenly another aneurysm in juncting M1/M2 it started to bleed and temporary clip on M1 was necessary. We continued dissection by finally clipping the aneurysm's neck with permanent Yasargil curved clip. The second after that aneurysm in AComA was clipped safely. A postoperative recovery revealed with left hand paresis. After a month she recovered to go back to work and drive her car.

Keywords: Multiple intercranial aneurysms, Subarachnoid haemorrhage, CT angio

EP-0080 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Cerebral Cavernomas Mimicking Meningioma

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Since cavernoma and meningioma have different pathology, cavernoma is radiologically mimick meningioma. We present two cases with cavernoma mimicking meningioma. A 57 year old man presented with progressive right ptosis and double vision. headache and 58 year old man presented with headache and vertigo. On admission, first patient's right eyelid ptosis was present for 2 months, and double vision for 1 week. The Magnetic resonance imaging revealed a sphenoid wing meningioma with dural tail. At surgery, the lesion was excised totally. Second patient's magnetic resonance imaging revealed a meningioma arising from the right falx at the posterior portion of the corpus callosum. At surgery, the lesion was excised totally. Both patients had uncomplicated postoperative course. Diagnosis of cavernoma was confirmed at two patients. Since preoperative diagnosis are increased with the development of radiological techniques, the pathology will diagnose the lesion.

Keywords: Cerebral cavernomas, Meningioma, Pathology, Radiology

EP-0081 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Complications following Treatment of Intracranial Dural Arteriovenous Fistulas

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Background: Intracranial dural arteriovenous fistulas (dAVF) are complex lesions which can cause severe neurological morbidity. The risk of hemorrhage is related to the presence of cortical venous drainage. Both endovascular and open surgical disconnection are the main treatment modalities. However, these treatments can carry high risk. The mechanisms of treatment related complications have not been studied extensively.

Method: We reviewed all cases of intracranial dural AVF treatment at a single institution over an eight-year period. Two patients

suffered serious neurological complications following treatment. The medical records and images of these patients were reviewed. A review of the literature regarding treatment complications was also performed.

Results: All three patients had Borden type III dural AVFs with cortical venous drainage. One patient underwent endovascular transvenous occlusion and the other two underwent posterior fossa craniotomy and surgical disconnection. The first patient developed thrombosis of the deep cerebral venous system as well as subarachnoid hemorrhage and died. The second patient developed extensive venous congestion of the posterior fossa requiring emergency decompression. The third patient developed a venous infarct of the craniocervical junction.

Conclusion: The present cases along with a review of published cases suggest many complications following treatment of dural AVFs have a common feature, namely the exuberant propagation of thrombosis into the normal venous drainage. This risk may be increased in cases where there is overlap of normal and pathological venous drainage. Anticoagulation in the perioperative period may be an option but yet unproven to reduce this risk.

Keywords: Dura, Artery, Vein, Fistula, Thrombosis

EP-0082 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Bilateral Thalamic and Brainstem Oedema Caused by Intracranial Dural Arteriovenous Fistula

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Intracranial dural arteriovenous fistulas (DAVFs) are a rare vascular lesions representing 1.6% of all arteriovenous malformations. The authors report a case of a 57 years old patient complaining of chronic tinnitus and headache, which were tolerable by the medical treatment, and weakness of limbs. He was received at emergency in a coma state with a glasgow score at 7. MRI has been done, and showing bilateral thalamic and brainstem oedema. He underwent a magnetic resonance angiography (MRA) and arteriography, which revealed a type V of the Lariboisière classification of DAVFs fed by two arteries (posterior meningeal and occipital). Endovascular embolization of the lesion has been tried as first line, and after failure, surgical option was decided. By sub-occipital midline craniotomy, the DAVFs was reached and cured. Two weeks after, the patient was showing an obvious improvement. The MRI and Angio-MRI were showing a complete disappearance of the fistula and resolving of the thalamic and brainstem oedema. The multidisciplinary and precocious treatment of high-grade fistulas improve the possibility of favorable outcome for the patient.

Keywords: Dural arteriovenous fistula, Oedema, Surgery

EP-0083 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Simultaneous Occurrence of Cavernous Sinus Dural Arteriovenous Fistulae in a Sister**

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Dural arteriovenous fistulas (DAVFs) are considered to be special arteriovenous malformations (AVMs) inside the dura. As you well know, the pathogenesis of this condition is not clear yet and little is known what are the possible mechanisms. Even they say the mechanism of cavernous sinus dural arteriovenous fistulas (CSDAVFs) could be different from that of other lesion such as transverse sinus DAVF. They are believed to be acquired shunts following trauma or cerebral venous thrombosis. However, DAVFs occurrence was documented with some hereditary congenital disorders, especially in pediatric patients. Precipitating factors such as DM were investigated too. Recently we experienced an interesting familial clustered occurrence of CSDAVFs in a two elderly first-degree related patients (siblings of the same parents). In our reported cases the CSDAVFs developed subsequently in the two sisters in a time frame of months and in age close to each other. No history of head trauma or medical condition that could predispose to the incidence of DAVFs was documented. There was a unique resemblance between the two sisters' CSDAVFs in many features concerning the laterality site, arterial feeders and pattern of venous drainage. To our knowledge, the familial occurrence of CSDAVFs wasn't documented in the literature before. We hypothesize that the coexistence of the CSDAVFs in those two sisters might be secondary to a familial predisposition. It is unlikely to be a mere coincidence in consideration of the facts we discussed.

Keywords: Familial occurrence, Dural arteriovenous fistulas, Cavernous sinus

EP-0084 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Surgical Treatment of Aneurysms of the Posterior Communicating Artery Previous – Surgical and Technical Details Case Results, Service of 231 Cases of the Past 10 Years**

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Background: Discuss the nuances and techniques of anatomical of aneurysms of the anterior communicating artery complex as the anatomical characteristics and angiográficas of injuries. The best types of approach and forms of treatment depend on shovels particularities of each case. Showing the epidemiology of this disease in service and their prognostico in 231 cases of last 10 years.

Method: Based on experience with pterional craniotomy performed on 231 cases over 10 years in Neurological Assistance São Bernardo, aneurysms of the anterior communicating artery complex, complemented with Swivel withdrawal straight when needed and

its implications and relations with branches from this region.

Results: The direction of the segment A1 correlates to the aneurysm. The patência of contralateral A1 and A2 segments must be observed. The adhesion of the aneurysm to the optic nerve restricts the retraction of the frontal lobe. Straight swivel aspiration is useful when the aneurysm has high location and the correlation of aneurysm with the arms of cerebral as aggravating in surgical technique and prognosis of the patient. The results were good at 94%, reasonable at 4%, bad at 2%, a patient, corresponding to 0.6% died as a result of surgical complication, and 1.4% died by complications clinics. There are a total dependency as the patient prior to surgery, the better the pre-surgical status, best surgical post status.

Conclusion: Communicating aneurysms are among the most complex intracranianos aneurysms. The technical details above pointed to are essential for therapeutic success and good prognosis of cases as observed in our case-by-case basis

Keywords: Aneurysm, Aneurysm of anterior communicating artery, Surgery, Results

EP-0085 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Surgery for Arteriovenous Malformations**

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Background: Surgery for arteriovenous malformations has a definite, proven and time-tested role in the treatment of arteriovenous malformations. The most important precondition for successful surgery is the selection of an appropriate and the right case.

Method: The author will analyze the anatomical and physical characteristics of arteriovenous malformation on the basis of a surgical experience of over 250 cases. The cases of arteriovenous malformation were divided into five grades on the basis of the extent of surgical difficulties that would be encountered during surgery. The grades were 'easy', 'difficult but safe', 'very difficult and risky but possible', 'not safe or possible due to the type of arteriovenous malformation' and 'difficult or risky due to the site of arteriovenous malformation'. The treatment modalities of arteriovenous malformations were divided into six groups namely 'no treatment', 'surgery', 'embolization followed by surgery', 'only embolization' and 'only radiosurgery'.

Results: The factors that determined the extent of surgical difficulties included 'site and eloquence of the area', 'number of feeding territories', 'degree and rate of flow', 'presence of flow-related aneurysms', and the 'physical nature' of the arteriovenous malformation that included the localized, diffuse and multiple nidus. The presentation will assess the role of surgery in the present day treatment of these lesions.

Keywords: Arteriovenous malformation, Surgery, Grading

EP-0086 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Influence of Ruptured Cerebral Arterial Aneurysm Location and Structure on the Characteristics of Intracranial Haemorrhage**

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Background: Prediction of aneurysm rupture outcome depends on the severity of intracranial bleeding, on the choosing optimal neurosurgical management and based on the assessment of lesion location and its structure. Aim of the study is to evaluate location and structure of cerebral arterial aneurysms in patients with different types of intracranial hemorrhage.

Method: Endovascular embolization with detachable coils was performed in 329 patients for obliteration of ruptured aneurysms. Among 326 cases included in the analysis 233 patients experienced isolated subarachnoid haemorrhage, 65 – ventricular bleeding, in 12 observations intracerebral haematoma was revealed and 16 aneurysms rupture resulted in parenchymal and ventricular haemorrhage.

Results: Vast majority of ruptured aneurysms were placed on the sidewall of harbouring cerebral artery which usually had lateral to midline position. Most of lesions were middle sized (from 5 to 15mm) with a neck width less than 4mm. Repeated ruptures were defined with significantly higher frequency in patients with complicated bleeding and its largest percentage was noticed in cases of intracerebral hematoma formation (67.7%) and relatively rarely with ventricular and ventricular-parenchymal hemorrhages, respectively 35.4% and 37.5 % of cases. No cerebellar or brainstem hematoma were found.

Conclusion: Structural features and localization of ruptured cerebral arterial aneurysms have some specificity to certain types of intracranial hemorrhage and may have predictive value regarding the severity of the disease and its consequences. A ratio of the size of ruptured aneurysm to its neck dimension in the vast majority of cases had favorable anatomy for endovascular embolization without assisting techniques.

Keywords: Cerebral aneurysm, Location, Structure, Rupture, Intracranial haemorrhage

EP-0087 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Left Side Ophthalmic ICA Giant Aneurysm. A Case Report**

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Most intracranial aneurysm can be managed with either microsurgical clipping or endovascular coiling. Aneurysms that arose from ophthalmic segment, ICA, are always challenging because of difficult anatomical position, which impose, besides performing of basic approach (pterional, OZY), to perform an extradural clinoidectomy, to get the right view to aneurysm's neck. We present a case-report of an ophthalmic giant ruptured aneurysm of the left internal carotid artery (ICA) in a 63 years old female. She

was admitted to our department three days after rupture. Computed tomography angiography revealed a giant ophthalmic aneurysm on the left. Neurologically she presented in Hunt-Hess 2. After the resolution of vasospasm we perform a left side pterional approach with extra-intradural clinoidectomy. This was enough to get the right angle and to place the clip. We placed one Yasargil clip that was enough to exclude the aneurysm from circulation. After operation the patient spent six days in the ICU. Later she improved and was discharged without any neurological deficit. Anterior clinoidectomy in some cases is an essential technique that allows us to successfully clip aneurysms which in the past were unclippable. That's why it is important, that in the period when endovascular techniques provide a real challenge for open surgery, every neurosurgeon should be able to perform complex procedure in case it is needed.

Keywords: Giant aneurysm, Anterior clinoidectomy, Clipping

EP-0088 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Results of Microsurgery for Poor-Grade Aneurysmal Subarachnoid Hemorrhage in the Endovascular Era**

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Background: Poor-grade aneurysmal subarachnoid hemorrhage (PGASAH) accounts for approximately 20-30% of all patients with SAH and associated with high mortality and morbidity rates. We aimed to evaluate the safety and efficacy of microsurgical treatment in the management of PGASAH in the endovascular treatment era.

Method: Health records of 67 patients with PGASAH undergoing microsurgical treatment were retrospectively reviewed.

Results: Forty eight (71.6%) patients were classified as Hunt and Hess grade IV and 19 (28.4%) as grade V at admission. Most patients (76%) underwent surgery within 24 hours of admission (ultraearly treatment). Bypass and trapping of the aneurysm were performed in 13.4%. Vasospasm was noted in 52.2% and shunt-dependent hydrocephalus in 65.7%. Thirty-day mortality rate was significantly higher among grade V patients (26.3% vs 6.3%, $p=0.036$). Mean follow-up duration was 5.0 ± 2.7 years. Good outcome (mRS:0-2) at 12 months was achieved in 77.1% of grade IV and 31.6% of grade V patients (overall: 64.2%). In univariate analysis, older age (>65 years), hypertension, hyperlipidemia, HH grade V, modified Fisher grade 4, IVH and/or ICH, larger aneurysms (>7 mm), cerebral infarcts were associated with poor outcome ($p<0.1$). Multivariate analysis revealed that age>65 years, HH grade V and new ischemic infarcts were independent predictors of poor outcome while smoking was related with favorable outcome ($p<0.05$).

Conclusion: With excellent long-term outcomes, microsurgery is still a viable and important treatment modality in the management of PGASAH in the endovascular era. Appropriate patient selection, early surgery, surgical experience, aggressive intensive care and rehabilitation can improve success of management.

Keywords: Poor grade, Aneurysmal subarachnoid hemorrhage, Surgery, Clipping, Outcome

EP-0089 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Hypopituitarism Secondary to Unruptured Intracavernous Carotid Aneurysm with Sellar Extension Associated with Ipsilateral Brain Abscess: A Case Report**

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Internal carotid artery (ICA) aneurysm with the sellar extension account for 1% to 2% of all intracranial aneurysms and the hypopituitarism caused by them are very rare. We present a case of hypopituitarism due to an intracavernous carotid aneurysm with sellar extension associated with ipsilateral brain abscess. A 73-years-old woman was admitted in our department with headache, fever, painful proptosis of the right eye and visual loss. Her physical examination revealed nonpulsatile exophthalmos of the right eye with conjunctival hyperemia, complete loss of light perception and third nerve palsy. A head computed tomography showed a right-sided heterogeneous intracavernous mass extending to the sella. The patient's condition deteriorated due to hypotension accompanied by episodes of atrial fibrillation. She became comatose and was intubated emergently. Her hormonal investigations revealed hypopituitarism manifested of low serum free thyroxine and TSH, low ACTH and diminished basal cortisol. The digital subtraction angiography showed an unruptured intracavernous aneurysm (15 x 17 x 11 mm) of right ICA with sellar extension. A repeat CT scan and MRI, discovered a brain abscess in the right temporal lobe (9 x 6 mm) with perifocal edema. She was placed on hormonal replacement therapy and antimicrobial therapy adapted to culture results. After 24 days of hospitalization, the patient status improved and she was discharged home with treatment recommendations.

Keywords: Hypopituitarism, Internal carotid artery aneurysm, Brain abscess

EP-0090 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Supratentorial Cavernomas. Surgical Outcomes in a Single-Center Series. Preliminary Experience**

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Background: Cerebral Cavernous Malformations (CCM) are common, affecting 1:250 adults. Most of these lesions are asymptomatic or have a benign course, but predisposing patients to a lifetime risk of recurrent episodes of hemorrhage, seizures, hemorrhagic stroke and neurological sequelae. Patients may harbor solitary lesions occurring sporadically and often associated with developmental venous anomaly, or multifocal lesions. Still, CCMs may be familial (hereditary), incidental or De Novo. The clinical behavior of CCM remains widely unpredictable.

Method: The prospective case-control study enrolled 54 subjects operated on with the diagnosis of supratentorial CCM. From

February 2004 to January 2014, patient's histories and previously adjudicated relevant disease parameters were obtained and stored prospectively in a database for analysis.

Results: Demographic characteristics of the 54 subjects were: mean patient age 32,4 years (range 2-64), and the female-to-male ratio was 1,5:1. Clinical presentations of cavernomas were hemorrhages (56%), seizures (47%), focal neurological deficit (28%), headache (16%) and incidental (3,7). Eleven patients experienced at least two prior bleeding episodes during their lifetime. Fourteen cases were sporadic, as they harbored a solitary lesion on the most sensitive SWI-MRI sequences. Six patients had a family history of CCM. No patient required reoperation.

Conclusion: Early age of lesion onset, multiple hemorrhages and progressive lesion growth have been correlated with disease severity.

Keywords: Cerebral cavernous malformation, Hemorrhage, Clinical presentation, Microsurgery

EP-0091 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Angiographic Evaluation of the Treatment of 790 Patients with Intracranial Aneurysm**

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Background: The most important primary cause of subarachnoid hemorrhage is intracranial aneurysms. Subarachnoid hemorrhage has high mortality and morbidity. The incidence of subarachnoid hemorrhage is 7,8/100.000 in the world.

Method: 790 patients who have been hospitalized with the diagnosis of intracranial aneurysm between 2001 and 2016 in Istanbul University Faculty of Medicine Department of Neurosurgery, have been investigated.

Results: 361 Middle Cerebral Artery Aneurysm (%33,8), 235 Anterior Communicating Artery Aneurysm (%22,06), 180 Internal Cerebral Artery Aneurysm (%16,9), 45 Anterior Cerebral Artery aneurysm (%4,22), 20 Anterior Choroidal Artery Aneurysm (%1,87), 5 Superior Hypophyseal Artery Aneurysm (%0,46), 41 Ophthalmic Artery Aneurysm (%3,84), 178 posterior circulation aneurysm (%16,85) have been investigated. 469 aneurysm out of 1065 was ruptured and 321 of them were unruptured aneurysm. 895 aneurysms (%84) out of 1065 has been treated either endovascularly or surgically and control Cerebral Angiography performed for 310 aneurysms (%34,6). 205 aneurysms (%66,1) that control Cerebral angiography performed out of 310, treated surgically. 186 aneurysms (%90,7) was totally obliterated and 19 aneurysms (%9,3) showed filling on control angiography. 105 aneurysms (%34,0) that control Cerebral angiography performed out of 308, treated endovascularly. 62 aneurysms (%59) was totally obliterated and 43 aneurysms (%41) showed filling on control angiography. Further treatment applied 19 aneurysms (%44,1) out of 43 aneurysm. 3 aneurysms (%15,7) surgically clipped and 16 aneurysms (%84,3) treated endovascularly.

Conclusion: When the control Cerebral Angiography examinations were compared, it was found that statistically significantly the

incidence of rest aneurysms was higher in the endovascular group.
Keywords: Aneurysm, Subarachnoid hemorrhage, Cerebral angiography, Surgery, Embolization

EP-0092 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Intraventricular Cerebral Cavernomas; Two Case Reports

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Intraventricular cavernomas are rare and occur 2-10% of patients with cavernoma. This case reports aim to present a rare cases of intraventricular cavernomas. A 20 year old man presented with headache and 42 year old man presented with seizure. On admission, patients had a Glasgow Coma Score of 15. There was no neurological deficit. The magnetic resonance imaging of the first patient revealed a interventricular cavernoma at the left frontal horn (31mmx25mmx15mm). The second patient had interventricular cavernoma at the roof of third ventricle (37mmx33mmx34mm). Two patients underwent surgery with interhemispheric approach. All patients discharged with a Glasgow Outcome Score 1. Intraventricular cavernomas have high tendency of rehemorrhage. Surgery should be done when presented with mass effect and seizure. Microsurgical removal of intraventricular cavernoma is important procedure and should be carried out by experienced neurosurgeon.
Keywords: Cerebral cavernoma, Intraventricular, Lateral ventricle, Third ventricle

EP-0093 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Aortic Dissection Presenting with Paraparesis

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Aortic dissection is an uncommon but life-threatening condition that is characterized by the separation of the layers within the aortic wall by the estimated incidence of 5-30 cases per million people per year. Mostly occurs in males with a peak in the range of 50-65 years. Frequently presents as sudden, severe chest, back or abdominal pain. We report an elderly male patient who presented with an unusual presentation of aortic dissection and was successfully managed with surgery. A 63-year-old male patient presented to the emergency department with complaints of numbness, tingling sensation and weakness in both legs, side pain, palpitations and sweating for an hour. His medical history was significant for hypertension and coronary artery disease. His medications included oral antihypertensives and acetylsalicylic acid. At admission he was afebrile, the blood pressure was 170/100 mmHg, a pulse rate of 88 beats/min. He was alert, cooperated and oriented. His physical examination revealed mild paraparesis with bilateral flexor plantar response. Thoracoabdominal computed tomography

(CT) with contrast showed an abdominal aorta dissection. An emergency operation was performed with successful recovery. The patient maintained a regular follow up and has remained asymptomatic. Aortic dissection has a high mortality rate despite advances in diagnostic and therapeutic modalities. Hypertension is an established precipitator of aortic dissection however, atypical presentation makes this diagnosis more difficult. Suspicion for aortic dissection is the key to diagnosing the patient in time and reduce morbidity and mortality.

Keywords: Aortic dissection, Paraparesis, Symptom, Diagnosis, Surgery

EP-0094 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Posttraumatic Hemorrhage of Intracerebral Cavernous Hemangioma

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Cavernous hemangiomas are benign congenital vascular malformations which have an estimated hemorrhage rate of approximately 0.7-1.7 percent per lesion each year. Only %10 percent of cavernous hemangioma patients get diagnosed after age 40. We report a 60 years old female patient with posttraumatic hemorrhage of right parietal cavernous hemangioma.

Keywords: Cavernous hemangioma, Head trauma, Elder patient

EP-0095 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Surgical Results of 500 Cases of Intracranial Aneurysms

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Background: We have reviewed our experience from 1997 to 2016 500 cases of intracranial aneurysms.

Method: The patients were 218 males, 282 females giving female predominance of 58%. The peak of incidence occurred in the fifth decade. Sixty percent of the patients were between the fourth and sixth decade. The locations of the aneurysms consisted of 188 (42 %) in the anterior communicating / anterior cerebral artery, (Acom / ACA), 115 (24 %) in the middle cerebral artery (MCA), 94 (21%) in the internal carotid artery (ICA), 24 (9%) in the distal anterior cerebral artery (DACA), 17 (4%) in the posterior circulation, 72 (14%) in the multiple aneurysms. Hunt grade at the time surgery was I-III. Ninety percent of the aneurysms were less than 15 mm in diameter. Angiographically or symptomatically documented vasospasm occurred in 22 (8 %) in patients.

Results: Vasospasm was improved by increasing the brain perfusion intraoperative irrigation. Postoperative results were classified into 5 categories: Excellent 48 %, Good 36 %, fair 8 %, poor 6 %, died 2 %.

Conclusion: For the better prognosis, surgical timing was based on the clinical condition, neurological grade, and radiologic finding.

Based on our experience and data, early surgery showed a better prognosis than delayed surgery.

Keywords: Aneurysm, Early surgery, Intracranial

EP-0096 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Clinical and Morphological Comparisons of Fatal Complications at Cerebral Arterial Aneurysm Rupture

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Background: Mortality at cerebral arterial aneurysm (AA) rupture is high; despite the timely hospitalization and quality medical care; comorbidities and complications have a negative impact on patient's condition, the possibilities and results of surgical treatment.

Method: A retrospective analysis of 140 medical records (63 men, 76 women aged 22 – 79 years) who died after cerebral AA rupture, was done.

Results: In terms up to 3 days 46.43% patients were hospitalized, in 4-7 days - 24.28%, in 8 days and more - 29.29%. 93.57% patients have been operated. In terms up to 3 days after AA rupture 2.15% patients died, in 4-7 days - 15.71%, in 8 days or more - 82.14%. Hydrocephalus was revealed in 27.86% patients; thrombosis of the base vessels - in 12.14%, disseminated intravascular coagulation - in 4.29%; angiospasm by transcranial Doppler was detected in 23.57%. Brain axial dislocation was observed in 92.52% patients. Hypertension was diagnosed in 82.14% cases, cerebral atherosclerosis - in 52.86%. Diabetes type 2 was revealed in 2.14% cases, chronic kidney disease - in 40%, other severe somatic pathology - in 15%. Purulent meningoencephalitis, ventriculitis were detected in 3.57% cases, pneumonia, purulent bronchitis - in 60.71%, pulmonary embolism - in 7.14%.

Conclusion: Cerebral AA rupture lethal complications were occlusion, hydrocephalus, vasospasm, brain structures axial translocation, severe somatic pathology. The majority of patients who died because of somatic complications, were hospitalized in terms 4 days or later after cerebral AA rupture. Retrospective analysis data should be considered when planning to optimize care in patients while cerebral AA rupture.

Keywords: Cerebral arterial aneurysm, Rupture, Fatal complications, Clinical and morphological comparisons

EP-0097 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Subfrontal Approach for Clipping Basilar Apex Aneurysm and Anterior Circulation Aneurysm

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Posterior circulation aneurysms account for approximately 15% of all intracranial aneurysms. Basilar apex aneurysms (BAA) are a surgical challenge due to their location in the anatomically complex interpeduncular cistern through narrow corridors surrounded by

eloquent neurovascular structures, with possibility of major vessel and perforator injury and difficulty in obtaining proximal and distal control. In this study, we describe the surgical management of basilar apex aneurysm utilizing subfrontal approach and review pertinent literature. The authors performed Subfrontal Approach for clipping one basilar apex aneurysm associated with anterior communicating artery aneurysm on the same time. The approach must have the shortest possible trajectory towards the target, must take a short amount of time, must be extra-axial, respecting the integrity of the brain, allow access to afferent arteries and to the aneurysmal neck. Subfrontal approach allow all objectives showing corridors to basilar bifurcation through optic chiasma, between optic nerve and internal carotid artery (ICA), ICA and oculomotor nerve, and oculomotor nerve and tentorial incisura, without great bone removal or muscle damage. Subtemporal approach for the treatment of basilar tip aneurysms offers a direct route for this vascular lesion. This approach is easy and fast to perform, without lesion of temporal muscle or great bone removal and can use to clipping posterior and anterior circulation aneurysms through the same approach.

Keywords: Basilar artery aneurysm, Subfrontal approach, Clipping

EP-0098 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Traumatic Cervical Arteriovenous Fistula: A Rare Cause of Trigeminal Neuralgia and Hemifacial Spasm (Case Report)

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Traumatic arteriovenous fistula (AVF) is one of the most misdiagnosed complications of vascular injuries. We report the case of a 63-year-old man who suffered a knife wound to the left neck twenty-five years ago. After surgery, the recovery was uneventful and the patient was discharged without any problems. Several weeks after surgery, the patient noticed a cervical thrill, tinnitus, bruit and headache. Since 2014, the patient suffered from right-sided trigeminal neuralgia (TN), which poorly responded to medical treatment. On admission, the neurological examination revealed a left-sided hemifacial spasm and hyperesthesia in the right V1 and V2 dermatomes. Magnetic resonance imaging showed marked congestion of the surface hemispheric veins and right cerebello-pontine region with venous compression of the right trigeminal nerve. Digital subtraction angiography confirmed an AVF of the left neck involving the left thyrocervical trunk, the V3 segment of left vertebral artery and the left internal jugular vein (IJV). The AVF exhibited retrograde flow into the left sigmoid sinus, left transverse sinus and increased intracranial venous pressure. The fistula was successfully embolized via femoral and radial access using liquid embolic agents. After the procedure, tinnitus, bruit and headache disappeared. Whereas the patient continued to suffer from TN, we decided to perform percutaneous trigeminal ganglion compression. According to this case, we recommend systematic investigation

of penetrating neck injuries for AVF. Early treatment of AVF is necessary in order to avoid associated complications.

Keywords: Cervical arteriovenous fistula, Trigeminal neuralgia, Hemifacial spasm, Endovascular treatment, Percutaneous trigeminal ganglion compression

EP-0099 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

The 'Radical Combined Approach' in Cerebral Arteriovenous Malformation Treatment: Technical Note

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AVMs are vessel anomalies where a connection between arterial and venous systems is present and the capillary bed is absent between the two. AVMs tend to present with seizures, headaches, focal neurological deficits and hemorrhage. Hemorrhage is the most common form of presentation. AVM's have a 2-4% annual risk of hemorrhage. Certain studies report this rate as 1%. The greatest discussion in AVM treatment is whether to use interventional treatment or monitor with medical treatment. There are 3 modalities that can be used for interventional treatment; microsurgical resection, endovascular embolization and stereotactic radiosurgery. Combined techniques are also possible. We will discuss a procedure named the "radical combined approach" in the interventional treatment of AVM in this article as we believe it has several advantages.

Keywords: Arteriovenous malformation, Interventional treatment, Radical combined

EP-0100 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Case Report: Two Traumatic DACA Aneurysms Formation in a Single Patient Following Closed Head Trauma

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Traumatic intracranial aneurysms are rare, occur in approximately 1% of intracranial aneurysms and the most common location is distal anterior cerebral artery(DACA). Closed head trauma causing traumatic movement of the brain may damage DACA alongside the free edge of the falx which lead to aneurysm formation. The average time from initial trauma to aneurysmal hemorrhage is approximately 21 days and is associated with a mortality rate as high as 50%. The surgical clipping of distal anterior cerebral artery aneurysm is challenging due to narrow operative field and difficulty in locating the aneurysm. To present a case report surgical treatment of the traumatic DACA aneurysm under CTA navigation. A 22 years old man had a history of closed head trauma which was

treated conservatively. He later presented with seizure after three weeks of trauma. Computed tomography and angiography showed right frontal hemorrhage with intraventricular hemorrhage caused by a ruptured traumatic pericallosal saccular aneurysm (diameter 17 mm) and incidental finding of unruptured distal cortical branch saccular aneurysm (diameter 6 mm). Surgical clipping of the ruptured aneurysm was done using CTA navigation. The ruptured aneurysm was successfully clipped in single attempt via interhemispheric approach under CTA IGS. Traumatic DACA aneurysms are rare. Prompt surgical or endovascular treatment of the aneurysm is important to help improve clinical outcomes.

Keywords: Traumatic intracranial aneurysm, Distal anterior cerebral artery, Image-guided surgery, Ruptured

EP-0101 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Surgical Treatment Outcomes of Cavernous Hemangiomas: A Retrospective Study

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Background: Intracranial cavernous hemangiomas (ICHs) are benign lesions. The general opinion among neurosurgeons is to remove symptomatic CHs. This study presents the surgical outcomes of oligodendrogliomas.

Method: The patients operated between the years 2006 and 2016, for ICHs at neurosurgery department in BRSHH institution. All patients underwent a craniotomy before neurosurgical tumor removal. Surgical outcomes were evaluated retrospectively using patients age, gender, complaints, the clinical course, locations and complications.

Results: 71 (46 female, 25 male) patients were operated for ICHs. The mean age was 37.9±16.3(5-73). The most common complaints were headache(95.8%), seizure(50.7%) and nausea±vomiting (24%), respectively. The most common locations were frontal (39.4%) and parietal (33.8%). The mean length stay was 6.4±8.2(2-29). Preoperative deficits were unchanged in 8 patients (11.3%). Morbidity (new deficit was developed) rate was 5.6% (4patients, 3 of them were experienced seizure). Postoperative residue was seen in 5 patients, 4 of them were re-operated and GTR was achieved. One patient was observed (refused re-operation). Mortality rate was 1.4% (related to surgery). No recurrent lesion was detected at their last follow-up period on average of 87.5±26.9(14-135) months. 2patients were experienced SSI, one was underwent surgery for hydrocephalus (placed VP shunt) and one else experienced deep ven thrombosis. 17 patients were treated using stereotactic guide.

Conclusion: Stereotactic guide resection is important option to treat ICHs especially for those placed in eloquent areas. 4 patients who were received gamma knife and failed to improve their symptoms they underwent surgery.

Keywords: Intracranial cavernous hemangioma, Gross total resection, Stereotactic guide, Gamma knife

EP-0102 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Clinical Outcome After Microsurgical Clipping of Unruptured Cerebral Aneurysms in Group of Patients at Age 70 or Older

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Background: There Is unproven consensus that Endovascular Therapy Is Safer In The Elderly Than Microsurgical Clipping And Considered Less-invasive, We Consider Microsurgical Treatment Of Aneurysms By An Experienced-Team safe and Less-Invasive Than Previously Thought Of. The Surgery Is Restricted To The Subarachnoid Space.

Method: Clinical outcome after clipping unruptured cerebral aneurysms in patients 70 And Older Retrospectively-Analyzed. All Patients Were Surgically Treated By Senior Author.

Results: 83 unruptured-aneurysms Were Clipped In 68 Patients. 10 M/58 F. Average Age 74.06 Y (70 -100). 76% Patients Were 70-75 Years; 19% - 76-80 Y; 4% - 81-90 Y. One Patient Was 100 38.5% Aneurysms Were <7mm; 42% - 7-12 mm; 17% Were 13<25 mm And 2.4% Were >25mm. 87% Aneurysms Were Located In Anterior Circulation Average Size 9.19 +/- 5.65mm (Median 9.5 mm) And 13%- In Posterior Circulation Average Size Of Aneurysm 10.04 +/- 3.39mm (Median -10.5 mm). Mortality Rate 1.4 % (1 Pt With Basilar Trunk 15 mm Aneurysm Had Acute Cardiovascular Collapse). Median Stay In Hospital – 5 Days. MRS-0 At Discharge - 46% Pts; MRS -1 In 28% Pts; MRS -2 – In 7% Pts. MRS 3-4 In 16% Pts. On F-Up 6 mo-1 Y 95% Had MRS 0-1. Recurrence Rate 0%. Patient Of 100 Years Of Age Was Discharged At Home On 4th Day After Clipping Of 15 mm Acom Aneurysm With MRS- 0.

Conclusion: Microsurgical treatment of aneurysms in the elderly performed by an experienced-team in a high-volume-center has an outcome compatible if not better than endovascular therapy and should not be considered more-invasive and more risky than the later.

Keywords: Unruptured aneurysm, Microsurgical clipping, Elderly patients, Outcome

EP-0103 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Cocaine Related Perimesencephalic Non-Aneurysmal Subarachnoid Hemorrhage: Case Report

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Cocaine abuse is a major problem especially in younger patients and associated with a higher risk of intracerebral (ICH) or subarachnoid haemorrhage (SAH). Although cocaine use has been associated with aneurysmal SAH, the effect of cocaine on non-aneurysmal SAH outcomes remains unclear. Whereas previous studies have suggested that the etiologies for intracerebral or subarachnoid haemorrhage in cocaine users include rapid increases in blood pressure, aneurysmal rupture, and vasculitis, these studies have

been limited by small sample size. A 27-year-old man was referred to our hospital because of sudden unconsciousness following severe headache and vomiting. History was remarkable for use of crack cocaine and last reported use was approximately a half hour prior to symptom onset. Neurologic examination did not reveal any focal deficits except for severe neck stiffness. Coagulation studies were normal. Computed tomography (CT) revealed perimesencephalic SAH. Magnetic resonance imaging (MRI) and four-vessel cerebral angiography revealed no potential source of hemorrhage. He was treated conservatively and discharged after one week without any neurological deficits. A repeat cerebral angiogram 2 months later again confirmed the absence of any aneurysm and vascular abnormality. The incidence of ICH and SAH following cocaine use is increasing. A history of severe headache immediately after using cocaine should alert neurosurgeons to the possibility of intracerebral haemorrhage. SAH can occur after a single dose misuse. Cranial CT should always be performed when severe headache or altered consciousness, or both, occur in relation to use of cocaine.

Keywords: Cerebral angiography, Cocaine, Perimesencephalic subarachnoid hemorrhage

EP-0104 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Using the Cavernous Carotid for Proximal Control: A Novel Approach to Temporary Clipping

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Paraclinoid-aneurysms continue to best be treated with microsurgical-clipping. This is enhanced by obtaining proximal control which is a challenge in some patients when the aneurysms are large and obstruct clinoidal segment of the internal-carotid. Although obtaining proximal control from the cervical-carotid is an option, it is not devoid of morbidity and an extra incision to the patient. Our experience in obtaining proximal control at the level of the distal-horizontal-segment of the cavernous-carotid-artery using few additional steps to the surgical approach with significant advantage and minimal to no morbidity. Using the pretemporal-extradural-approach, the anteromedial-aspect of the lateral wall of the cs is exposed. The space between v1 and v2 is used to control bleeding from the cavernous-sinus by injecting fibrin-gel. This step neutralizes bleeding from the sinus and allows sharp dissection of the 4th nerve at the apex of parkinson's-triangle to expose the distal cavernous-internal-carotid artery for the application of temporary clips. The approach was used in no less than 5 complex paraclinoid aneurysms. Proximal intracavernous control allowed the safe drilling of the anterior clinoid process when part of the clinoid was eroded by the aneurysm. It was also used for patients with large very proximal ophthalmic-type-aneurysms that obstructed the view of the clinoidal-segment of the internal-carotid it was also advantageous in transitional type aneurysms that involve the dural-ring-region with intracavernous and intradural component of the aneurysms obliterating the clinoidal-segment. Intracavernous-proximal control increases the safety and surgical maneuverability for clipping complex-paraclinoid-aneurysms. It saves the patient from additional surgery with its potential risks.

Keywords: Cavernous carotid, Temporary clipping, Proximal segment, Paraclinoid aneurysms

EP-0105 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

A Novel Classification System Based on Preoperative Factors is Predictive of Functional Outcomes in Patients with Aneurysmal Subarachnoid Hemorrhage

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Background: Although subarachnoid hemorrhage (SAH) is a highly fatal disease and common cause of disability, few cohort studies have examined the role of predictive indicators of functional outcomes. Therefore, in this study we aimed to evaluate impact of preoperative factors including partial thromboplastin time (PTT), prothrombin time (PT), international normalized ratio (INR), and vitamin K as prognostic markers of bleeding tendency.

Method: In a multicenter study, preoperative levels of PTT, PT, INR, and vitamin K of patients with SAH (n=525) were measured using standard method of quick one-stage analysis. Postoperative functional outcomes of patients who underwent same surgery were assessed by independent neurosurgeons.

Results: The levels of PTT, PT, INR, and vitamin K were significantly different in subgroups of SAH patients based on postoperative outcomes ($P < 0.05$). Furthermore, application of stepwise method of discriminant analysis yielded three significant discrimination functions of classification due to the presence of seven levels of categorical variables in this analysis. The most important function explained 87% of the total variance with correlation value of 0.81.

Conclusion: Taken together, our preliminary analysis suggests that although we found some functions to predict most of the outcomes of patients with SAH, further studies will be required to individuate more predictive indicators of outcomes of these patients as proved by the data on PTT, PT, INR, and vitamin K.

Keywords: Subarachnoid hemorrhage, Partial thromboplastin time, Prothrombin time, International normalized ratio, Vitamin K

EP-0106 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Hemostatic Clips for Middle Cerebral Artery Vascular Reconstruction: Report of Two Cases

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The vascular closure staples (VCS)-clips has been studied in animal models and shown to have comparable results with sutured repair when it comes to the healing process, degree of vessel narrowing and risk of thrombosis. However, they are clearly superior when the speed of application is taken into account and they were clinically used in many vascular repair processes. Nevertheless, their usefulness in intracranial vascular surgery has not been described. Two female patients diagnosed with giant symptomatic cavernous sinus aneurysms were undergoing elective endovascular procedures that were complicated by the dislodgement of coils into the m1 segment of mca. Both patients were treated performing m1 arteriotomies and coil embolectomy. To avoid prolonged temporary occlusion in the m1 perforator's territory, the arteriotomies were

repaired using microhemoclips in less than 10 minutes with reestablishment of flow. In both patients, flow was reestablished in the m1 segments. In one patient, the coils extended to the temporal m2 causing intimal injury and leading to diminished flow. M1 segments in both patients were patent on later angiographic studies. We describe the advantage of emergent cerebrovascular arteriotomy and embolectomy in a rapid repair process that helped avoid massive ischemic injury. We believe this technique should be added to the armamentarium of neurosurgical cerebrovascular options.

Keywords: Hemoclips, Vascular repair, Arteriotomy

EP-0107 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Investigation of the Pro-Inflammatory Cytokines in Patients After Aneurysmal Subarachnoid Haemorrhage

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Levels of -1 β , -6 interleukins, tumor necrosis factor- α (TNF- α), C-reactive protein (CRP) were analyzed in 52 patients in the blood serum and in 30 patients in cerebrospinal fluid (CSF) using enzymeimmunoassay. The samples were taken on the 1-3 th and 6-10 th day following the subarachnoid haemorrhage (SAH). Instrumental examination included brain multi spiral CT, digital cerebral angiography, ultrasonography. Microsurgical aneurysm obliteration of ruptured aneurysm was carried out all cases. Results. The interleukin-6 level in serum was 20-30 times higher in compare with the control group; the indices were increase in patients with cerebral vasospasm (VS) and in patients likely to have severe morbidity or fatal outcome ($p < 0,05$). The interleukin-6 level in the CSF was 100-150 times higher compared to the patients without aneurysm rupture. The levels of interleukins-1 β and TNF- α in the serum and CSF were 2-5 times increased. The CRP indices in the serum was significantly higher, than in a control group ($p < 0,05$), they was different, depending on severity of VS ($p = 0,05$), and vary with severity of the disease outcome ($p < 0,05$). The increased levels cytokines and CRP during the first 10 days after aneurysm rupture indicate the active inflammatory process, which gives grounds for the use of antiinflammatory therapy. An association been established between the increase of interleukin-6 level and CRP in the serum, presence of cerebral VS, as well as severity of the disease outcome, may consider application of this markers as prognostic factors.

Keywords: Subarachnoid haemorrhage, Cerebral vasospasm, Interleukin-6, CRP, Nitrite, Endothelin-1

EP-0108 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Anatomic Basis and Treatment of Previously Treated PCOM Aneurysms Presenting with Regrowth

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Although recurrence or rupture of already clipped aneurysms is not that common, it mainly occurs due to residual aneurysm left after incomplete clipping. We describe the anatomic basis behind posterior communicating artery (pcom) aneurysm recurrence and suggest a better clipping method. We report four patients with previously clipped pcom aneurysms that presented to the senior author a.F.K with either rupture (one patient) or regrowth (three patients). All patients received pre-surgical angiogram evaluations and/or ct angiography. The aneurysms were assessed intraoperatively under the microscope and full exposure of the neck and dome were attained. The site of re-rupture in one patient and the regrowth in others were found to be at a similar site of the aneurysm. This suggested an almost identical pattern of clipping where part of the aneurysm neck was not fully clipped. The missed part of the aneurysm is located in the medial underbelly of the neck of the aneurysm. This spot is difficult to see through a regular pterional or supraorbital approach. We circumvented this difficulty with better visualization using the pretemporal route. Microsurgical clipping for pcom aneurysms has a low regrowth rate compared to endovascular therapy. The regrowth rate can further be minimized by a better understanding of the anatomy of the neck and utilizing the pretemporal route for its better visualization.

Keywords: PCOM aneurysm, Regrowth, Pretemporal approach

EP-0109 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Encephaloduromysynangiosis (EDMS) on a Pediatric Patient with Cerebral Proliferative Angiopathy

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Cerebral proliferative angiopathy (CPA) is a rare cerebral vascular lesion characterized by diffuse vascular abnormalities with intermingled normal brain parenchyma. CPA has a complex clinical presentation, and many patients present with ischemic symptoms. We described a case of a 6-year-old boy presenting with transient dizziness with weakness of left limbs. MRI showed the presence of a diffusely dilated extensive vascular lesion mainly located in the corpus callosum, right frontal and temporal lobes. Digital subtraction angiography revealed a large hypervascular lesion with a diffuse arterial supply. 99mTc-ECD SPECT cerebral blood flow perfusion image revealed decreased perfusion in right frontal and parietal lobe. There is no consensus on treatment of CPA, but the hemodynamic characteristics of CPA is more similar to moyamoya disease in the PWI-MR study. Furthermore, we speculated that increased regional cerebral blood flow perfusion may relieve clinical symptoms and improve prognosis of patient with CPA. Therefore, a surgical procedure of encephaloduromysynangiosis (EDMS) was performed on this patient, and the patient exhibited disappearance of TIAs during the follow-up period. 99mTc-ECD SPECT obtained 6 months after surgery showed significant improvement of right frontal and parietal blood perfusion. MR perfusion at follow-up period demonstrated the blood flow and range of vascular lesion decreased significantly compared with preoperative MR perfusion. Follow-up angiography also showed well compensation by profound neovascularization through

the superficial temporal artery, and vascular malformation disappeared around the region supplied by external carotid artery. EDMS procedure may be a reasonable and effective treatment for patients with ischemia associated with CPA.

Keywords: Cerebral proliferative angiopathy (CPA), Encephaloduromysynangiosis (EDMS), Cerebral ischemia

EP-0110 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Management of Ruptured Intracranial Dissecting Aneurysms: A Two Year Experience

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Background: Intracranial dissecting aneurysm are rare cause of intracranial bleed and controversies exist in treatment of these lesions. We share our two year institutional experience in management of these lesions.

Method: We retrospectively analysed cases admitted in our unit with ruptured intracranial dissecting aneurysms. Admitted between August 2014 to July 2016. The cases were analysed for treatment offered, arterial patency and outcome.

Results: Total ten cases with such lesions were evaluated. Six of them were located in anterior circulation while four of them were in posterior circulation. Six of them underwent microsurgical clipping while four were treated with Endovascular techniques. Arterial latency was achieved in four cases. There was one mortality.

Conclusion: Intracranial arterial dissecting aneurysms are rare lesion and combined planing of micro Neurosurgeon and Endovascular Neurosurgeon is required to provide optimal treatment. "Out of the Box" thinking st times can preserve arterial potency and can prevent significant neurological morbidity.

Keywords: Dissecting aneurysm, Clipping, Coiling

EP-0111 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Clinical and Topographic Profile of Cerebral Aneurysms in Children and Adolescents

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Background: Approximately 85% of intracranial aneurysms are located in the anterior circulation of the Willis polygon. Hereditary syndromes, smoking, alcoholism, systemic arterial hypertension, family history of aneurysms are important risk factors. The International Study of Non-Broken Brain Aneurysms (ISUA) concluded: size and location are the main determinants of aneurysmal rupture (the lower the aneurysm, the lower risk of rupture, and those located in the ACM) Our aim is to determine the epidemiological profile of aneurysms (AICNRs) in a referral hospital in Neurosurgery.

Method: A retrospective, descriptive study was carried out through the collection of data from 16 patients with NNRTIs.

Results: Higher prevalence in women (62.5%), age group of 60 to 70 (16%), followed by right and left internal carotid arteries (12% each) and middle cerebral (12%), left carotid-ophthalmic arteries, middle cerebral arteries (8% each), right carotid-ophthalmic arteries and bifurcation of the right internal carotid artery (4% each). Thirteen were smaller than 0.7cm (65%), 6 were between 0.7 and 1, 2cm (30%) and 1 between 1.2 and 2.4cm (5%). Symptoms: headache in 56.25% of cases; 18.75% without complaints; Symptoms of low incidence: hemiparesis, syncope, dizziness, diplopia, ophthalmoparesis and recent memory deficit. Of the comorbidities: HAS (50%), diabetes mellitus (18.75%) and smoking (15.62%).

Conclusion: Women and the age group above 60 years were the most affected. Aneurysms smaller than 0.7 cm were protective factors for rupture. The control of hypertension and smoking are crucial to reduce the incidence of new cases.

Keywords: Brain aneurysms, Cerebrovascular diseases, Teenagers, Children

EP-0112 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Rare Case of Giant Pediatric Cavernous Angioma of the Temporal Lobe: A Case Report and Review of the Literature

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Giant cavernous angiomas of the central nervous system are rare. They are vascular benign lesion angiographically occult. We report a case of 18 months years old boy who presented a seizure with a normal clinical examination. Neuroimaging showed a large left temporal process with heterogeneous enhancement, important perilesional edema and mass effect. Angiography was occult. The patient underwent surgery with a total removal. The pathology concludes to an intracranial cavernous angioma. The outcome was good. The purpose of this paper is to document a very rare case of giant cavernous angioma mimicking a neoplastic lesion with a review of literature.

Keywords: Cavernous angioma, Giant, Pediatric, Intracranial

EP-0113 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

An Unusual Presentation of Fahr's Disease as Aneurysmal Subarachnoid Hemorrhage: Case Report

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Fahr's disease refers to sporadic or familial idiopathic basal ganglia, cerebral and cerebellar calcification. Typical presentation starts in the 4th to 5th decades of life. Patients present with pyramidal, extrapyramidal, cerebellar, psychiatric and cognitive manifestations. Fahr's disease may also lead to loss of consciousness which is usually secondary to seizures. We report a case of previously unknown Fahr's

disease presenting with aneurysmal subarachnoid hemorrhage. This case is the second case of Fahr's disease presenting with aneurysmal subarachnoid hemorrhage reported in the literature so far. Forty-one-years-old female patient who had three-week history of headache presented with an attack of severe headache and loss of consciousness secondary to a complex-partial seizure. Physical and laboratory and examinations were unremarkable. Cranial computed tomography of the patient revealed subarachnoid hemorrhage, frontal intracerebral hematoma, extensive bilateral calcifications at basal ganglia, cerebellum and white matter of cerebral cortex suggesting Fahr's disease. Digital subtraction angiography revealed anterior communicating artery aneurysm. Open surgical clipping was offered but the patient refused open the treatment. This report suggests that aneurysmal subarachnoid hemorrhage should be considered in differential diagnosis of Fahr's disease presenting with loss of consciousness.

Keywords: Fahr's disease, Aneurysm, Subarachnoid hemorrhage

EP-0114 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Large Intracranial Aneurysms: Multiple Modalities of Treatments and Risk Factors for Prognosis

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Background: There are several types of treatment for large aneurysms. The aims of this study are to compare the results among the different treatment modalities for aneurysms larger than 15 mm and to find the associated factors with prognosis.

Method: We analyzed the 60 patients, having the aneurysms larger than 15 mm. The patients have been treated from January, 2009 to December, 2015 in our institute. The modalities were divided into three categories, surgical clipping, endovascular coiling, and PED insertion. It were evaluated the risk factors; sex, age and whether the aneurysms were ruptured or unruptured. The outcomes of treatments were assessed with a modified Rankin score; good outcome (0-2) and poor outcome (3-6).

Results: The patients consist of 10 men (16.7%) and 50 women (83.3%), aged 12 to 79 (mean age, 58.1 years). It was conducted 6 surgeries, 39 endovascular embolizations, 15 PED insertions. No differences in the treatment outcomes were observed between the sex, age and among the modalities of treatment. On the other hand, from a view of whether the aneurysms are ruptured or unruptured, the ruptured cases show that 11 (64.7%) are in poor outcome groups, and 6 (35.3%) are in good outcome groups. In the unruptured cases, 9 (20.9%) are in poor outcome groups, and 34 (79.1%) are in good outcome groups.

Conclusion: The current study suggest that the ruptured aneurysms are the negative prognostic factors in the treatment of aneurysms larger than 15 mm. Age, sex and the type of treatment were not associated with treatment outcome.

Keywords: Intracranial aneurysm, Large aneurysm, Treatment outcome

EP-0115 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Unilateral Fenestrated A1 Segment of Anterior Cerebral Artery Associated Aneurysms**

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Vascular anomalies of brain are not very frequent in surgical practice; they represent a wide spectrum of congenital conditions that result from development disorders which are mainly found in anatomical cadaveric dissection studies. Such abnormalities like arterial fenestrations may be physiologically silent and clinically asymptomatic, but in some cases due to weakened arterial wall it causes aneurysms. When surgeon encounters intraoperatively fenestration with aneurysm, it is challenging case that requires unique surgical management. We have to know these lesions in order to deal with them. Fenestrations of the A1 segment of the anterior cerebral artery are uncommon. Two cases of unilateral A1 fenestration which is found in a cadaveric dissection study only. The fenestrations are usually clinically silent, but, weakening of the vessels wall decreases the resistance to hemodynamic changes, so in proximal part of fenestration aneurysm may develop. During segmental duplication of the lumen into distinct channels while having same endothelial lining they may or may not share adventitial layer. We demonstrated 2 cases of unilateral fenestration and aneurysm of the A1 segment ACA which are usually uncommon. The fenestration of the A1 segment is known to be associated with various anomalies, in our case it is the aneurysms, so existing fenestration, predisposing to development of even multiple aneurysms and the fact that the perforators can arise from the neck of aneurysm is important in the planning of the clipping surgery.

Keywords: Arterial fenestration, A1 segment, Anterior cerebral artery

EP-0116 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Ruptured Intracranial Dermoid Cyst Associated with Rupture of Cerebral Aneurysm**

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Many tumors have been reported to coexist with cerebral aneurysm. However, intracranial dermoid cysts associated with cerebral aneurysm are very rare. We report a case in which rupture of a cerebral aneurysm resulted in a ruptured dermoid cyst. We present this interesting case and review current literature about the relationship between tumors and aneurysm formation.

Keywords: Dermoid cyst, Aneurysm, Rupture

EP-0117 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Trigeminal Neuralgia Caused by Venous Angioma, The Neuroimaging and Surgical Findings**

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Trigeminal neuralgia (TN) is the most common facial pain syndrome that may become sudden, recurrent and chronic. TN is generally unilateral and rarely bilateral neurological disorder. We report a case of trigeminal neuralgia caused by venous angioma and describe the neuroimaging and surgical findings. A 47-year-old female patient was admitted to our clinic due to pain of left cheek. The symptoms were first presented 22 years ago. She was conservatively treated with carbamazepine, clonazepam and haloperidol. RF ablation was used twice for treatment of the pain. But the patient's complaint has not diminished. A cranial magnetic resonance imaging (MRI) – MR Angiography with contrast showed abnormally dilated vessels, in the left posterior fossa. It is compatible with venous angioma. The draining vein of these venules was shown to be next to the entry zone of trigeminal nerve. Microvascular decompression (MVD) was performed with left suboccipital craniotomy and duraplasty. At the operation, the adhesions between the venous angioma and the trigeminal nerve were removed. A barrier was formed between the nerve and the artery using Teflon instruments. At the postoperative 1 month follow-up, the patient was completely free of pain. Trigeminal neuralgia caused by venous angioma is so rare, reported less than twenty times in the English literature to our knowledge. Only 12 cases of their treatment are MVD. MVD is a suitable treatment in patients with recurrent pain. Complications of surgical treatment are bleeding, partial relief pain, focal neurologic deficit, general anesthesia complications.

Keywords: Microvascular decompression, Trigeminal neuralgia, Venous angioma

EP-0118 [Neurovascular Surgery » Aneurysms and Vascular Malformations]**Intraoperative Microanatomy of Anterior Communicating Artery Segment**

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Aim: To define the anatomic variations of anterior communicating artery complex intraoperatively and provide a successful surgery and detailed information for neurosurgeons in order to prevent possible neurological damages.

Method: The video records and photographs obtained from 130 patients operated via pterional approach in Erzurum Atatürk University Medical Faculty Neurosurgery Department were retrospectively investigated. Anterior communicating artery aneurysms were observed as posterior, superior, inferior or anterior according to the projection of the aneurysm. Anterior communicating artery complex variations were observed as A1 hypoplasia, median artery of corpus callosum, duplication of anterior communicating artery, A1 duplication and azygos artery.

Results: The projections of the aneurysms in 84 aneurysm cases were towards posterior in 42.8% of the cases (n=36), to superior in 32.1% of the cases (n=27), to inferior in 14.2% of the cases (n=12) and to anterior in 10.9% of the cases (n= 9). Variations of anterior communicating artery complex were observed in 70 cases. A1 hypoplasia, median artery of corpus callosum, duplication of anterior communicating artery, A1 duplication and azygos artery were observed in 42.8% (n=30), 25.7% (n= 18), 14.2% (n=10), 12.8% (n=9) and 4.5% (n=3) of the patients, respectively.

Conclusion: Anterior communicating artery complex is the localization where the variations are observed mostly. Clear definition of the microanatomy and variations of ACA complex prior to the surgery enables the surgeon a successful plan, rapid and safe microdissection, and less neurological deficits in the postoperative period.

Keywords: Anterior communicating artery, Intraoperative, Microanatomy

EP-0119 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Surgical Treatment of Anterior Circulation Aneurysms with SAH

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Background: We have analyzed the perioperative clinical outcome data of 300 patients treated with microsurgery technique. Overall 331 anterior circulation aneurysms have been clipped within 1-4 day after subarachnoid hemorrhage.

Method: During 5 years (2012-2017) 300 patients with subarachnoid hemorrhage and 331 anterior circulation aneurysms were identified. All of them were surgically clipped within first 1-4 day after SAH. There were 166 female and 134 male. Mean age was 54 year (± 27 years). The distribution of aneurysms by localization: 155 AcomA aneurysm (47%), 103 MCA aneurysm (31%), 65 ICA aneurysm (19%), 8 distal ACA aneurysm (3%). Mean Hunt Hess grade was 2.25. Mean Fisher grade was 2.88. Perioperative clinical condition was evaluated by Glasgow Outcome scale (GOS).

Results: In a month after surgery good outcome according to the GOS (IV, V) was achieved in 68.3% of cases (n=205), and poor outcome COS (I,II,III) in 31,7% cases (n=95).

Conclusion: Our results suggested that surgical clipping still remaining to be a gold standard in the treatment of the anterior circulation aneurysms.

Keywords: Aneurysms, Subarachnoid hemorrhage, Surgical treatment

EP-0120 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Spinal Dural Arteriovenous Fistulas: Intraoperative Neurophysiological and Microvascular Doppler Monitoring

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Aim: To evaluate the role of intraoperative neurophysiological monitoring (IOM) and microvascular doppler monitoring (IMDM) during surgical treatment of SDAFVs.

Method: From March 2007 to March 2013, 12 patients had microsurgery with IOM and IMDM for SDAFVs. The IOM included somatosensory evoked potentials (SEPs), motor evoked potentials (MEPs), and D-waves. All patients were evaluated at admission and at follow up (6,12 and 24 months) with the Aminoff-Logue Disability Scales (ALS) for Gait (G-ALS), Micturition (M-ALS) and Gait + Micturition (G+M-ALS).

Results: During surgery, we registered absence of significant modifications of evoked potential in 9 cases (75 %), while improvement of MEPs occurred in 3 cases (25 %). The mean score G+M-ALS before surgery was 6.00 ± 1.53 , whereas at 24 months follow-up there was a statistically significant improvement of $1,75 \pm 1.12$ ($p=0.03$). At univariate analysis, the G+M-ALS score was directly associated with duration of symptom before the surgery ($p=0.024$), higher preoperative G-ALS ($p= 0.02$), M-ALS ($p=0.022$), G+M-ALS scores ($p=0.045$) and improvement of IOM after temporary occlusion of the fistula ($p=0.025$). In all cases, microDoppler confirmed the location of the fistula and revealed an arterial spectrum on the redundant dorsal medullary veins.

Conclusion: In our series no significant worsening of evoked potentials occurred and subsequently the surgical strategy was not changed by IOM. However, no false negative was registered and IOM predicted absence of new post-operative neurological deficit in all patients. Patients with improvement of IOM parameters after occlusion of the fistula have greater chances of postsurgical improvement.

Keywords: Spinal dural arteriovenous fistula, Intraoperative neurophysiological monitoring, Microvascular doppler monitoring

EP-0121 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Vein of Galen Malformation in Adult

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This is a case of a patient presenting with status epilepticus, and suspected to have brain tumor. Further investigation revealed Vein

of Galen malformation. 51 years old gentleman was referred from tertiary care facility due to headache and giddiness for about two days. He also claimed to have body weakness of the right side for the same period. Witnessed by family members that patient had spontaneous jerky movement involving upper and lower limbs, associated with uprolling eyeballs and drooling saliva. Therefore, he was brought to emergency department. On assessment, patient was alert conscious. Vital signs stable. Higher mental function intact. Cranial nerve examination showed pupils bilaterally reactive and funduscopy showed papilloedema. Motor examination and sensory examination is intact and no cerebellar sign demonstrated. Patient underwent CT brain and noted to have a lesion at pineal region with obstructive hydrocephalus, and shunted at right frontal region. After discussion with radiologist, the lesion at the pineal region could be venous anomaly, therefore patient was subjected for digital subtraction angiogram (DSA). Angiogram findings for this patient indicated several multiple fistulous connections between bilateral ICA, ECA and vertebral arteries with Galenic system. Persistent median prosencephalic vein (MPV) which was aneurysmally dilated. The internal cerebral veins were not opacified. Patient is planned for ECHO-cardiogram and embolisation. Vein of Galen malformation, is commonly found in infant and fetus, but very rare in adult. Our Patient need for further intervention due “steal phenomenon” causing him to have fits.

Keywords: Vein of galen malformation, Congenital vascular malformation, Vein of galen aneurysm in adult

EP-0122 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Acute Subdural Hematoma Caused by the Rupture of Internal Carotid Artery Aneurysm

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Subarachnoid hemorrhage (SAH) rarely associated with acute subdural hematoma (aSDH) originating from ruptured intracranial aneurysm and this situation carries poor prognosis. We reported an internal carotid artery (ICA) aneurysm ruptured with aSDH. A 53-year-old male patient was brought to the emergency room due to loss of consciousness. Hemiparesis was detected in a patient's GKS:5. Computerized tomography (CT) of the patient underwent imaging and CT angiography was performed on aSDH. CT angiography revealed aneurysm in right supraclinoid segment of ICA. The patient was immediately urged who was clipped to the aneurysm died in the intensive care unit during the follow-up on the third postoperative day. It is known that aSDH is often associated with trauma. A cerebral aneurysm rupture in the subdural space is a rare and often fatal condition. It has been emphasized in the literature that such bleeds may develop due to arachnoid adhesions, rupture of arachnoid membrane by pressure bleeding in ICA aneurysms, and eradication of cavernous sinus wall by intracavernous aneurysms. Right brain aSDH were observed in the patient who applied to our center with loss of consciousness without trauma. On CT angiography, right ICA supraclinoid segment aneurysm rupture was detected and an aneurysm clipping operation was performed with microsurgical method. The patient was taken to the intensive care

unit after the operation and died on the third day. In conclusion, it should be remembered that aneurysm rupture to the subdural space is fatal and patients with spontaneous aSDH should be examined in this regard by considering the aneurysm.

Keywords: Aneurysm, Fatal, Hematoma, Subdural

EP-0123 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Spontaneous Subarachnoid Haemorrhage Complications: Hydrocephalus Impact

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Aim: To determine the influence of hydrocephalus on treatment results in patients with spontaneous subarachnoid haemorrhage (sSAH).

Method: One hundred fifteen consecutive patients with sSAH who were treated between January 2011 and January 2016 were retrospectively studied. In 74 patients clipping or coiling of aneurysm (s) were performed.

Results: Overall, 16 of the 115 patients (13%) developed acute hydrocephalus after sSAH. The study population consisted of 9 male and 7 female patients with mean age 52 years (range, 25–75 yr). Intraventricular hemorrhage and intracerebral hematoma was present in 11 (69%) of cases. The overall mortality in hydrocephalus group was 62%, compared with 14% between all patients with sSAH.

Conclusion: The presence of hydrocephalus is predictor of poor treatment results in patients with sSAH. Early surgical treatment of the hydrocephalus might be helpful in decreasing of morbidity rates and improving of outcome.

Keywords: Subarachnoid haemorrhage, Hydrocephalus, Aneurysm

EP-0124 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Endoscopic Endonasal Resection of Cavernous Sinus Hemangioma: Case Report and Literature Review

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Cavernous sinus hemangiomas (CSH) account for less than 2% of all cavernous sinus tumors. Surgical intervention for CSH is challenging because of high morbidity and mortality due to anatomical difficulty and surgical complications. We present a case of CSH that operated with fully endoscopic endonasal approach ended by gross total resection. A 42 year old female presented with atypical facial pain and dizziness. No pathological findings were noted on neurological examination. In cranial MRI, a tumor was observed that shows homogeneous contrast enhancement, originating from left cavernous sinus extends to foramen ovale and inferior orbital fissure. Cavernous hemangioma were gross totally resected with endoscopic transpterygoid approach. Endoscopic endonasal approach for CSH is a safe alternative surgical option with lower

complication rates. Subtotal resections could be performed when the tumor border is unsafe. Stereotactic radiosurgery to the residual mass may result in an excellent response and avoidance of morbidity.

Keywords: Cavernous, Sinus, Hemangioma, Endoscopic, Endonasal, Resection

EP-0125 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Epidemiological Study of Non-Broken Brain Aneurysms and Their Neurosurgical Implications

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Background: Approximately 85% of intracranial aneurysms are located in the anterior circulation of the Willis polygon. Hereditary syndromes, smoking, alcoholism, systemic arterial hypertension, family history of aneurysms are important risk factors. The International Study of Non-Broken Brain Aneurysms (ISUA) concluded: size and location are the main determinants of aneurysmal rupture (the lower the aneurysm, the lower risk of rupture, and those located in the ACM.) Our aim is to determine the epidemiological profile of non-broken brain aneurysms (NBBA) in a reference hospital in Neurosurgery.

Method: A retrospective, descriptive study was performed through the collection of data from 16 patients with NBBA.

Results: Higher prevalence in women (62.5%), age group of 60 to 70 (16%), followed by right and left internal carotid arteries (12% each) and middle cerebral (12%), left carotid-ophthalmic arteries, middle cerebral arteries (8% each), right carotid-ophthalmic arteries and bifurcation of the right internal carotid artery (4% each). Thirteen were smaller than 0.7cm (65%), 6 were between 0.7 and 1, 2cm (30%) and 1 between 1.2 and 2.4cm (5%). Symptoms: headache in 56.25% of cases; 18.75% without complaints; Symptoms of low incidence: hemiparesis, syncope, dizziness, diplopia, ophthalmoparesis and recent memory deficit. Of the comorbidities: HAS (50%), diabetes mellitus (18.75%) and smoking (15.62%).

Conclusion: Women and the age group above 60 years were the most affected. Aneurysms smaller than 0.7 cm were protective factors for rupture. The control of hypertension and smoking are crucial to reduce the incidence of new cases.

Keywords: Cerebral aneurysms, Epidemiology, Neurosurgical procedures

EP-0126 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Giant M3 Aneurysm Presented with Cerebrovascular Ischemia

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Peripheral large and giant Middle cerebral aneurysms (MCA) are

rare and difficult to treat. Mass effect and SAH are the frequent clinical signs of giant aneurysms. Management of these aneurysms differ from case to case. Trapping, STA-MCA bypass, total excision and endovascular treatment are different strategies used by surgeons. We present a case with peripheral M3 aneurysm came with ischemia and mass effect at the dominant side. A right handed 56 year-old man presented with headache, dysphasia and 4/5 right hemiparesis for 10 days. The patient first diagnosis cerebrovascular ischemia. CT angiography and brain MRI showed the left M3 giant aneurysm (5x5x4.5 cm) then the patient admitted to Department of Neurosurgery. GKS was 13 and patient consciousness was lost within hours. Control CT scan showed increased subfalcian herniation. The operation was planned urgently through a left sided fronto-temporo-lateral craniotomy, followed by trans- Sylvian dissection following the internal carotid artery from proximal to distal up to the bifurcation following the MCA till the aneurysm was visualized and prepared. The permanent clip on M3 temporal part applied followed by excision of the aneurysm and. Since ischemia was permanent on CT and MRI scan for ten days, we did not perform an EC-IC bypass. He was then extubated on the next postoperative day with 3/5 right hemiparesis. This case showed us there could be an option in treating such a rare type of aneurysm without the performance of an EC-IC bypass because of permanent ischemia.

Keywords: M3 aneurysm, Ischemia, Giant

EP-0127 [Neurovascular Surgery » Aneurysms and Vascular Malformations]

Intraoperative Indocyanine Green (ICG) Angiography and Surgical Disconnection of Spinal Dural Arteriovenous Fistulae (DVAf): Single Institute Experience

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Background: Spinal dural arteriovenous fistula (DAVF) is the most common vascular malformation of the spinal cord and cause progressive myelopathy. Preoperative digital subtraction spinal angiography is the investigation to identify and localize the feeder or feeders. Microsurgical disconnection with intraoperative indocyanine green (ICG) angiography ensures complete obliteration of the fistulae especially with multiple feeders.

Method: A retrospective review of prospective maintained database of 16 patients was included from April 2012 to December 2016. They were treated with microsurgical disconnection with intraoperative intravenous administration of ICG. Most fistulae were a slow-flow type -1 fistulae with single arterial feeder that had been disconnected and confirmed with intraoperative indocyanine green (ICG) angiography. In one case there was multiple feeders for the fistula which was only appreciated and identified with intra-operative ICG angiography and helped in complete surgical obliteration.

Results: Preoperative digital subtraction spinal angiography identified and localized the feeder of Spinal DAVF in all but one had multiple feeders which was not appreciated or detected with the preoperative spinal angiogram. In all patients, ICG angiography ensured intraoperative direct visualization and the fistulous connection was identified and successfully treated surgically. In one

case with multiple feeders intra-operative ICG angiography ensured complete disconnection and obliteration of the fistula.

Conclusion: Intraoperative indocyanine green (ICG) angiography in the setting of surgical management of spinal DAVF is a simple and effective technique for intraoperative confirmation of the relevant lesions and detecting the multiple arterial feeders.

Keywords: DAVE, Surgery, Indocyanine green (ICG) angiography

EP-0128 [Neurovascular Surgery » Others]

Frontoparietal Region Subacute Epidural Hematoma Rapidly Disappearance

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Trauma is the most common risk factor in epidural hematoma (EH) patients. EH is broadly thought to be a disease of the youngs and is well recognized and managed in the aged population. Other etiologies, including arachnoid cyst, spontaneous intracranial hypotension, arteriovenous malformation, coagulopathy, aneurysm, often coexist and promote the development of EH. A 84-year-old man presented to our outpatient unit with an increasingly severe headache of 3 days duration. He was examined in the emergency services following head injury 3 days previously with no loss of consciousness or any external injuries. On admission, the patient had no focal neurological deficits. Hematological and biochemistry profiles were within the normal limits. A computed tomography (CT) scan of his head revealed bilateral subdural effusion at his fist admission. His outpatient admission day, CT scan revealed left side frontoparietal epidural hematoma. After the diagnosis, We decided to follow-up the patient very closely clinically in our neurosurgery ward. We followed up the patient at our service. After 48 hours, a CT scan revealed and epidural hematoma disappearance was seen. Although surgical intervention choices like performing burr hole drainage or open craniotomy are widely accepted, on the condition that the neurological examination of the patient is without any deficits, non-surgical treatment may be a appropriate approach giving time to EH self resolution process in order to restore the normal perfusion of the brain.

Keywords: Epidural hematoma, Trauma, Elderly patient

EP-0129 [Neurovascular Surgery » Others]

Endovascular Operations in the Treatment of Atherosclerotic Lesions of the Cerebral and Coronary Arteries

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Background: We have triaged and treated 347 patients with combined atherosclerotic lesions of cerebral and coronary arteries. All patients suffered from symptoms of both cerebral and coronary ischemia.

Method: Patients were divided in three groups. First group consisted of 212 patients who underwent interventions on cerebral arteries. Second group consisted of 71 patients who underwent

interventions on coronary arteries. Third group consisted of 64 patients who were operated on both coronary and cerebral vessels. Angiographic studies, including cerebral and coronary angiography were performed using Philips Integris V3000 angiographic system (Netherlands) according to standard techniques. One third of patients underwent simultaneous cerebral and coronary angiography. All patients (347) underwent 508 surgeries in total, 229 of which were endovascular procedures.

Results: Four (1.2%) patients died during early postoperative period. Selective approach to the use of various surgical techniques in patients with combined cerebral and coronary atherosclerosis allows achieving good treatment results with low postoperative mortality. Patients with combined cerebral and coronary atherosclerosis comprise the group which is characterized by exceptional difficulty in terms of selection of appropriate tactics and methods of surgical treatment.

Conclusion: The indication for the use of endovascular interventions is the lack of adequate collateral blood flow both in the brain and the myocardium. The use of endovascular techniques allows to lower the risk of cerebral and cardiac complications significantly and to improve the results of treatment.

Keywords: Atherosclerotic lesions, Cerebral arteries, Coronary arteries, Endovascular interventions

EP-0130 [Neurovascular Surgery » Others]

Aneurysmal Subarachnoid Hemorrhage: Factors Influencing Poor Outcome

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Background: Patients presenting aneurysmal subarachnoid hemorrhage (SAH) have commonly been reported to have a poor prognosis. We analyzed our database to identify factors determining poor outcome: the composite of in-hospital death from any cause and Glasgow Outcome Scale (GOS) ≤ 3 at hospital discharge after SAH.

Method: During the period 2007-2015, 70 patients with SAH were treated in our institution. On admission data including patient characteristics, radiologic features, and functional neurologic outcome were assessed and further analyzed. A multivariate analysis was performed to identify predictors of poor outcome.

Results: Twenty-nine percent of patients had an unfavorable evolution. Patients with miotic or mydriatic pupils or anisocoria had worse outcomes ($p = 0.001$). Patients who experienced the composite endpoint of death or GOS ≤ 3 had higher levels of blood sugar ($p = 0.0001$), and increased numbers of leukocytes ($p = 0.001$). In multivariate analysis, for every milligram the glycaemia grows, the probability of events increases in 2% ($p = 0.034$).

Conclusion: Patients with subarachnoid hemorrhage worsen their prognosis as the increase of glycaemia.

Keywords: Aneurysmal subarachnoid hemorrhage, Clinical outcome, Neurocritical care

EP-0131 [Neurovascular Surgery » Others]

Demonstration of the Effects of Spontaneous Subarachnoid Haemorrhage and Increased Intracranial Pressure on the Optic Nerve in an Experimental SAH

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Neurodegeneration that develops as secondary to spontaneous, ischemic or traumatic injuries is one of the most important cause of the permanent or temporary disability. Recent studies that developed neuroprotective agents have failed to obtain clear results and the data on progressive neurodegeneration have remained insufficient. Optic nerve damage can occur directly as a result of conditions that increase intracranial pressure such as haemorrhage. Optic nerve is often affected by the compression caused by the developing oedema. The aim of the present study is to demonstrate the effects of SAH associated with increased intracranial pressure on the optic nerve and the role of mannitol in preventing the damage as a drug with proven efficiency in reducing intracranial pressure. Early administration of medical therapy would therefore alleviate primary mechanical effects and possibly would prevent the development of secondary conditions caused by optic nerve damage. Histopathological and immunohistochemical findings showed that the drug reduced oedema and cellular inflammation in the mannitol-treated group and exerted beneficial effects in regeneration and axonal growth after optic nerve damage. In conclusion, it is thought that, prompt intervention to conditions resulting in increased intracranial pressure as subarachnoid haemorrhage and early institution of medical therapy might reduce the optic nerve damage along with primary favourable effects on the brain and these may also prevent optic disorders that could occur as a result of injury in the long term.

Keywords: Subarachnoid hemorrhage, Optic nerve damage, GAP-43 protein

EP-0132 [Neurovascular Surgery » Others]

Preoperative Predictive Factors for Surgical and Functional Outcomes in Chronic Subdural Hematoma

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Background: Chronic subdural hematoma (CSDH) is a frequently encountered neurosurgical condition, especially in the elderly. We investigated predictive factors for surgical and functional outcomes after burr-hole drainage (BHD) surgery.

Method: All patients with CSDH treated by BHD between January of 2012 and December of 2014 were included in this study. All patients were classified by symptom, clinical grade, time, location, hematoma density, midline shift, and other characteristics. Pre- and postoperative CT evaluation was performed at 0, 3 and 6 months. Clinical grades were classified as described in Markwalder et al. Surgical and clinical outcomes were evaluated with the brain expansion rate and modified Rankin Scale (mRS). Brain expansion rate was calculated as the ratio between post- and pre-operative

hematoma thickness. Recurrence was defined as the occurrence of symptoms and hematoma on CT within 6 months.

Results: This study included 130 patients over two years. Among the variable parameters, young age (<75), iso-density of hematoma on CT, and short duration from symptom to surgery were correlated with readily brain expansion. Patients with readily brain expansion had fewer recurrences. In terms of mRS, young age, iso-density, and good clinical grade were correlated with good functional outcomes.

Conclusion: Clinicians should be more aware of general conditions and medical problems, especially in elderly patients. Memranectomy should be considered in patients with a long duration of symptoms or hypodense hematomas to promote ready brain expansion and good mRS scores.

Keywords: Subdural hematoma, Burrhole drainage, Craniotomy, Predictive factor, Outcome

EP-0133 [Neurovascular Surgery » Others]

Cerebral Venous Thrombosis: An Underestimated Cause of Intracerebral Hemorrhages

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Background: Cerebral Venous Thrombosis (CVT) is an uncommon disease and instead having a highly variable clinical presentation, very often shows intracerebral hemorrhage. Four major syndromes had been described in patients with CVT: isolated intracranial hypertension, focal neurological deficits, focal or generalized seizures and disturbances of consciousness and cognitive dysfunction. The mortality rate varies in proportion to the delay in diagnosis. Many factors are associated to the hypercoagulability state, like intrinsic hematological disorders, dehydration, pregnancy and oral contraceptives.

Method: We presented eleven consecutive patients admitted to our service with a diagnosis of CVT, all of them has a minor or major intracerebral hemorrhage, The treatment of these cases are a clinical one, what differentiates from other causes.

Results: All patients were treated by full anticoagulation, occurring sinus' partial recanalization, with great neurologic evolution.

Conclusion: The diagnosis of CVT should be considered in patients with acute, subacute or chronic headache, with or without signs of intracranial hypertension or focal deficits, even in the absence of cerebrovascular risk factors. Treatment should be started as soon as the diagnosis is confirmed and consists of reversing the underlying cause when known, control of seizures and intracranial hypertension, and antithrombotic therapy. The image scening of choice is angio NMR, or angiography

Keywords: Intracranial sinus thrombosis, Stroke, Thrombophilia, Case reports

EP-0134 [Neurovascular Surgery » Others]**The Impact of Intrathecal Verapamil on Cerebral Vasospasm in an Experimental Subarachnoid Hemorrhage (SAH) Model**

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Aim: To investigate the impact of intrathecal verapamil on cerebral vasospasm in an experimental SAH model.

Method: 24 male Sprague-Dawley rats were randomized into 3 groups. We cannulated tail artery under general anesthesia. Then atlantooccipital membranes were exposed under occipital muscles. Cisterna magna was reached via a 25G needle. We drained CSF 0,2 ml in the verapamil group and 0.1 ml in the others. In the Sham group, CSF we drained we injected it back. In the other groups, arterial blood (0.1ml) drawn from the tail artery, was slowly injected into the cisterna magna. In the treatment group 0.1 ml 100 µg verapamil injected at same place two minutes after blood injection. Same routine repeated 48 hour later. Rats were sacrificed at seventh day. We measured Basilar artery lumen diameter and Wall thickness, ET-1 serum level, apoptotic index, oxidative stress ratio.

Results: Cerebral vasospasm, which develops after subarachnoid hemorrhage, increased serum Endothelin-1 level. Vasospasm increased apoptotic index by increasing Bax and Caspase-3 levels and decreasing Bcl-2 level. Also, total antioxidants (TAS) decreased whereas total oxidants increased. Basilar artery wall was found to be thicker and diameter of basillary artery lumen decreased because of the vasospasm. Conversely, Endothelin-1 level, apoptotic index, oxidative stress, vascular wall thickness *decreased* and basilar artery diameter *increased* in the verapamil group.

Conclusion: Our results showed that intrathecal verapamil decreased apoptosis, oxidative injury, Endothelin-1, artery wall thickening and vasoconstriction. These findings suggest that intrathecal verapamil may provide an effective treatment in vasospasm. Further pre-clinic and clinic studies are warranted.

Keywords: Cerebral vasospasm, Intrathecal verapamil, Oxidative stress, Apoptosis, Endothelin-1, Subarachnoid hemorrhage

EP-0135 [Pediatric Neurosurgery » Basic Science]**Association Study in Chinese Children Confirms IGHV Gene Haplotype Block as Conferring Risk to Moyamoya Disease**

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Background: The etiology of Moyamoya disease (MMD) remains unknown. Auto immune dysfunction may play an important role in the pathogenesis of this rare disease. We investigate single nucleotide polymorphisms (SNPs) found previously associated with auto immune disease and perform a genetic analysis among Chinese pediatric patients with MMD.

Method: We analyzed patients' DNA for SNPs in HLA, TLR, and IGHV, which have been previously associated with auto immune disease. Genotyping was performed by sequencing the genetic regions containing the SNPs with custom-made primers. The polymorphisms of genes above were included among 48 cases and 50 controls.

Results: The mean age of MMD children was 6.72±3.63 years old. We found IGHV SNPs polymorphisms were associated with MMD, which were rs17113284, rs8005468, rs10129255, rs2007467, rs10150241 and rs12590667. Haplotype block TGCCTC and CATTAT were significantly different between MMD children and healthy control.

Conclusion: Our findings provide evidence that there may be a relationship between MMD and auto-immune dysfunction. Further mechanism study in the relationship between IGHV variations and MMD may provide a therapy target.

Keywords: Moyamoya disease, Single nucleotide polymorphism, IGHV, Children

EP-0136 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Occipito-Cervical Fusion in Children: Literature Review**

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Occipitocervical fusion techniques in children are describe in the literature, although there is no consensus about which construction achieves best results and requires some type of post-op immobilization. Our main goal was to review the literature, demonstrate the accomplishments about this issue, and point a direction to achieve best outcomes on management of craniocervical instability. We performed a search on PUBMED database looking for all publications available involving postop. immobilization after occipitocervical fusion. Case reports, randomized controlled trials, case series, describing occipitocervical junction pathologies, its characteristics and treatment, were selected. Results showed that the majority of occipito-cervical instabilization cases were prior to congenital causes, followed by trauma. The most common type of surgery performed was occipitocervical fusion using screw and rods constructs. There was no concordance in which kind of postop. immobilization to use. Surgeons chose accordingly to each case. In conclusion, better-designed studies, as systematic reviews, need to be performed before a guideline about this topic is established.

Keywords: Occipitocervical fusion, Children, Post-operative immobilization

EP-0137 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Management of Communicating Hydrocephalus in Infants Younger than One Year of Age: Place of the Choroid Plexus Cauterization

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Aim: To determine whether, and in which patients, the outcome for choroid plexus cauterization (CPC) combined with endoscopic third ventriculostomy (ETV) is superior to ETV alone.

Method: This is a prospective study performed in Neurosurgery Department Of Blida University Hospital From January 2006 to January 2017. A Total of 501 children underwent ventriculostomy as candidates for primary endoscopic treatment of hydrocephalus.

Results: The ETV was accomplished in 501 children: 280 underwent a combined ETV-CPC procedure and 221 underwent ETV alone. The hydrocephalus was associated with myelomeningocele in 54,9% cases, idiopathic in 24,7%, postinfectious in 19,3%, and posthemorrhagic 1%. Overall, the success rate of ETV-CPC (68.5%) was superior to that of ETV alone (49%) among infants younger than 1 year of age. The ETV-CPC combined procedure was superior in patients with a myelomeningocele (68% compared with 38,7% success), and those with idiopathic hydrocephalus (73,6% compared with 35,2% success). Although the difference was not significant for PIH (67% compared with 62% success). The overall surgical mortality rate was 1.8%, and the infection rate was less than 1%.

Conclusion: The ETV-CPC is more successful than ETV alone in infants younger than 1 year of age. In developing countries in which a dependence on shunts is dangerous, ETV-CPC may be the best option for treating hydrocephalus in infants, particularly for idiopathic hydrocephalus and those associated with myelomeningocele.

Keywords: Hydrocephalus, Endoscopic third ventriculostomy, Choroid plexus cauterization, Minimally invasive surgery

EP-0138 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Minimal Invasion Surgery for Compound Craniosynostosis Correction. Presentation of a Case

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Craniosynostosis is the premature closure of one or more skull sutures. It can be syndromic or non-syndromic, simple or compound. An average case is reported in 2500 births. The compound craniosynostosis is the premature closure of two or more cranial sutures without syndromic association. Surgery is the basis of treatment with neurological and aesthetic goals. We present the case of a patient with premature closure of the sagittal suture and bilateral lambdoidea, the latter partially closed. Seven-month-old girl,

with changes in the shape of her head, parietooccipital flattening, decreased biparietal diameter, compensatory bulging of frontal and temporal region. Delayed performance in neuropsychological tests globally. In simple skull tomography with 3D reconstruction, fusion of the sagittal suture and partially bilateral lambdoid was observed. Cranial plasty was performed using a minimal invasion technique, which consisted of two 2.5 cm incisions of length each and two incisions on each side of 1.5 cm. The technique was performed without the use of neuroendoscopy or postoperative helmet, and a 7-month postoperative CT scan. Surgery time two hours, approximate bleeding 100 ml. In-hospital stay time 3 days. Evaluation of neurodevelopment; Batelle Development Inventory, showed overall improvement at six months. We present a single case of compound craniosynostosis operated using a minimal invasion technique. Surgical goals were met for those who undergo this type of open surgery, in this case with minimally invasive surgery.

Keywords: Compound cranyosinostosis, Minimal invasive surgery, Craniosynostosis

EP-0139 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Transnasal Approach for Congenital Nasoethmoid Meningocele with Chronic Cerebrospinal Fluid Leak - A Case Report

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An 11 y.o. female presented with chronic CSF leak from left nostril for over 10 years. CT and MR studies suggested a paramedian lamina cribrosa 8x3 mm defect with resulting nasoethmoid meningocele in the left nasal cavity. Due to the localization and size of the defect, an intracranial approach was very traumatic with a relatively high probability of failed closure. A joint neurosurgical-otolaryngological operation was performed utilizing transnasal approach. Antibacterial prophylaxis was initiated 1 day before operation, stopped on 5th postoperative day. Patient was placed in Trendelenburg position with extended head, and operation microscope and neuronavigation was used to resect the sac and identify the bone defect. The defect was closed using a harvested m. fascia latae myofascial fragment and fibrin glue. Nasal cavity was tamponed with hemostatic sponge. Lumbar drain was not inserted. Postoperatively, bedrest with elevated headrest at 45 degrees for 3 days, with progressive increase of activities. Postoperative period uneventful, CSF leak fully resolved. Patient was discharged on 9th postoperative day. MR control with CSF dynamic studies 3 months postoperatively revealed full closure of the defect. At 6 month and 1 year follow-up, patient remains symptom-free, competes in athletics. Transnasal approach to lamina cribrosa inborn defects provides a more direct and less traumatic solution to CSF leak closure in comparison to transcranial approach, provided that measures to ensure higher precision (ENT assistance, neuronavigation, operative microscope, antibacterial prophylaxis, optional lumbar drain) are taken.

Keywords: Inborn, Defect, Transnasal, Approach, CSF, Leak

EP-0140 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Anterior Plagiocephaly- A Case Report and Reconstructive Technique**

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Anterior plagiocephaly is a result of premature unilateral fusion of the coronary suture. It is the third most common form of non-syndromic craniosynostoses. Its main features include forehead, supraorbital arch and anterior cranial fossa deformation as well as orbital asymmetry. We describe a boy with anterior plagiocephaly, who has undergone an extensive craniofacial reconstruction. In order to relieve the cranial distortion and decompress the growing brain, reconstructive surgery was performed. The skin incision was running in coronal plane. The periosteum was cut from the left to the right pterion and separated from the bone. Then, the aponeurosis of the temporal muscle was dissected off the sphenoid and temporal bone. A rise of bifrontal bone flap followed. The craniotomy ran bilaterally to the pterion and to both coronary sutures. The dura was epidurally dissected from the base of the anterior fossa and the sphenoid wings and then a frontoorbital bone strip (also named the bandeau) was removed. The bandeau osteotomy was running over the frontonasal suture, both frontozigomatic sutures and through the orbital roofs. After the bandeau harvesting, the remodelling followed. The bandeau was cut in the middle of the supraorbital arches and the asymmetry between the left and the right side was corrected. The remodelled frontoorbital bandeau was returned back to place in a new position. In this way, the flattened and retracted right orbit was remodelled and the asymmetry was corrected. The next step included the correction of the flattened frontal bone on the right side.

Keywords: Craniosynostosis, Plagiocephaly, Reconstruction

EP-0141 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Dural Molding for Complex and Advanced Cases of Craniosynostosis**

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Background: Complex cases of craniosynostosis represent a challenge for correction. Most interest is directed towards bone remodeling, with the help of miniplates. In this work we are presenting a different concept. Our focus was on Dural shape remodeling rather than bone remodeling.

Method: This technique has been applied so far on six patients. Their age was less than one year. Four patients had brachycephaly, and two had cloverleaf skull. Dural remodeling was achieved by using coronal vicryl stitches pruning from side to side. These stitches gradually reorient the Dural envelop from transverse to longitudinal. In cloverleaf deformities, the Dural envelope change from trifoliate to regular rounded. Bone was then simply over the remodeled dura with no plates.

Results: The technique proved to be safe and well tolerated. Considerable and immediate change in the dura and the skull was achieved. Blood transfusion was needed in all cases. No plates were used in any of our cases.

Conclusion: Dural molding is a new concept. Though simple, it proved to be effective for complex cases of craniosynostosis and brachycephaly.

Keywords: Craniosynostosis, Brachycephaly, Dural molding, Cloverleaf

EP-0142 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Early Surgical Repair of Sphenoid Dysplasia in Children Affected by Neurofibromatosis Type 1**

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Sphenoid bone dysplasia in Neurofibromatosis type 1 is characterized by progressive exophthalmos and facial disfiguration secondary to herniation of meningeal and cerebral structures. We describe a technique for reconstruction of the sphenoid defect apt at preventing or correcting the ocular globe dislocation. After placement of spinal cerebrospinal fluid drainage to reduce intracranial pressure, the temporal pole is posteriorly dislocated extradurally. The greater sphenoid wing defect is identified. A titanium mesh covered by lyophilized dura, modeled in a curved fashion, is interposed between the bone defect and the cerebro-meningeal structures with its convex surface over the retracted temporal pole. The particular configuration of the titanium mesh allows a self-maintaining position due to the pressure exerted by the brain over its convex central part with its lateral margins consequently pushed and self-anchored against the medial and lateral walls of the temporal fossa. Screws fixation is not needed. The technique utilized in 4 cases proved to be reliable at the long-term clinical and neuroradiological controls (6 to 19 years). Sphenoid bone dysplasia in NF1 resulting in proptosis and exophthalmos is usually progressive. It can be surgically repaired using a curved titanium mesh with the convexity faced to the temporal pole that is in the opposite fashion from all the techniques previously introduced. When utilized early in life the technique can prevent the occurrence of the orbital and facial disfiguration.

Keywords: Neurofibromatosis, Paediatric, Sphenoid dysplasia

EP-0143 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Surgical Treatment of Childhood Thoracic Spinal Tuberculosis: Two Case Reports and Technical Note**

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The development of paraplegia and kyphosis are two important problems related spinal tuberculosis (Pott's disease) in children. The current study aims to present two pediatric Pott's disease, point out the progression of this disease in children, surgical options and surgical outcomes. Case 1: A 4-year-old boy was referred to our department with back pain and failure to walk that began one month ago and progressed thereafter. He had severe spastic paraparesis, and his neurologic condition was assessed as grade C according to the Frankel scoring system. MRI showed destruction at T 4-5-6 levels, proximal thoracic gibbous deformity, and that the local kyphosis angle between T3-T7 had increased to 71 degrees. Case 2: A 2-year-old boy presented with severe back pain and paraparesis of one-month duration. MRI demonstrated destruction with a large paraspinal abscess involving T5-T6-T7 levels, compressing the spinal cord. Both patients are treated surgically. Microbiological examination of both samples revealed on M.Tuberculosis. Orthoses are applied three months after operations. Antituberculosis treatment protocol was given. Preoperative paraparesis had recovered completely and muscle strengths all returned to normal in both children. There is no loss of correction during the follow-up periods. Spinal tuberculosis is a dynamic disease that may lead to severe deformities in childhood. Especially in cases where two or more vertebrae are affected, early surgical treatment is essential to prevent severe kyphosis and the dependent complications. Surgical intervention accompanied with antituberculosis medications protocol is essential to cure treatment in pediatric population.

Keywords: Pott's disease, Corpectomy, Instrumentation, Spinal tuberculosis

EP-0144 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Combined Technique (Endoscopic and Shunting) for the Treatment of Posthemorrhagic Hydrocephalus in Children

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Background: Posthemorrhagic hydrocephalus in children is an important clinical problem for neurosurgeons. Endoscopic third ventriculostomies are usually failed and ventriculoperitoneal shunts are obstructed frequently. The aim of this study is to emphasize the importance of combined approach (endoscopic+shunting) on the management of posthemorrhagic hydrocephalus and to document our experience on this disease.

Method: A total of 3 pediatric patients underwent surgery for posthemorrhagic hydrocephalus between 2008 and 2012. The mean age was 22 months (between 3 months and 15 years) and 2 patients were male and one patient was female. Germinal matrix hemorrhage was the cause of hydrocephalus in 2 patients and head trauma in one patient. Endoscopic third ventriculostomy+shunting was performed in 2 patients and endoscopic septostomy+shunting in one patient. Endoscopic opening of intraventricular adhesions was performed in all patients during surgery. The mean follow-up was 12 months (between 3 and 24 months).

Results: Clinical improvement was observed and the size of lateral ventricles was diminished in all of 3 patients. The opening of the intraventricular adhesions and thick membranes were main

difficulties of the endoscopic surgery while the main advantage of endoscopy is the correct placement of the ventricular catheter of the shunt. Yellow and irregular ventricular surface caused poor vision and orientation during endoscopy. No shunt revision was performed in these patients. Children with posthemorrhagic hydrocephalus are poor candidates for endoscopic treatment. Intraventricular adhesions and thick membranes are the major problems during surgery. Anatomical variations and yellow ventricular surface deteriorate the orientation of neurosurgeon.

Conclusion: Combined technique including endoscopic fenestration and shunting seems the best approach for posthemorrhagic hydrocephalus in children.

Keywords: Hydrocephalus, Hemorrhage, Shunt

EP-0145 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

High Cervical Posterior Instrumentation in the Pediatric Population: An Analysis of 11 Consecutive Patients

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Background: The upper cervical spine (C1, C2) is a frequent site of traumatic, congenital, and inflammatory pathology that causes spinal cord compression and/or instability. It usually requires internal fixation to provide immediate immobilization and long-term fusion. Constructs that use lateral mass, pedicle screws or transarticular C1-C2 screws provide greater rigidity in axial loading, rotation, lateral flexion, and flexion-extension. They are, however, not preferred in the very young because of this population's small sized vertebrae and concern for adversely effecting spine growth.

Method: Eleven (11) consecutive patients (4 female, 7 male, mean age 5.75 years) underwent C1-C2 posterior instrumentation and arthrodesis for the treatment of high cervical spine lesions between January 2012 and December 2016. Of those 11 patients, 6 patients were 5 years of age or under. Lateral mass screws were inserted in C1 and pedicle screws in C2. Intraoperative electrophysiological monitoring was used in all cases. Seven patients had Bow-Hunter's syndrome, and 4 patients had C1-C2 instability (3 congenital, 1 traumatic). Autologous bone graft was used in all cases.

Results: There were no vascular or neurological complications and no superficial or deep infections. Mean estimated blood loss was 60 mL. Satisfactory sagittal alignment was achieved in all cases. There was no pseudoarthrosis. Mean follow-up was 9.6 months (min: 1 month, max: 45 months).

Conclusion: In our series, the application of C1 lateral mass and C2 pedicle screws with autograft yielded great efficacy and safety and is our preference for C1-C2 instrumentation in the pediatric population.

Keywords: Upper cervical instability, Lateral mass, Transarticular, Transpedicular, Posterior instrumentation

EP-0146 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Local Autograft Versus Mixture of Autograft and Allograft Combination with Posterior Instrumentation for Adolescent Idiopathic Scoliosis: A Retrospective Comparative Clinical Study**

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Background: Allografts have been shown to be almost as efficient as autografts in the adolescent population. The main restrictions on the use of allografts today is its negative impact on surgery costs. The aim of our study was to determine the need for allograft in the surgical treatment of Adolescent Idiopathic Scoliosis (AIS), compare the results of the fusion achieved through the use of local autografts alone with those achieved through the use mixture of autografts and allografts.

Method: Fifty-four patients with a minimum follow-up period of two years were divided into two groups and evaluated. Local autografts harvested from the facet joints of the thoracic and lumbar vertebrae were used in 28 (23 female, 5male) patients, with mean age of 14.2 years, which comprised the autograft group. The grafts were placed over the top and bottom three segments of the fusion site. Local autografts and autografts combined were used in 26 (22 female, 4male) patients, with mean age of 15.1 years, which comprised the allograft group and applied over the whole fusion levels.

Results: The mean follow-up period is 45.2 months for the autograft and 45.7 months for the allograft group. A mean of 59.8 cc of freeze-dried crushed cancellous graft was used in the allograft group. Fusion was achieved in all patients in both groups.

Conclusion: The major disadvantage of using allografts today is raising the cost of surgery. Our grafting technique has shown that fusion can be achieved through application of local autografts alone, without using allografts.

Keywords: Adolescent idiopathic scoliosis, Autograft, Allograft, Surgical cost, Grafting technique

EP-0147 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Angiocatheter Technique for Arachnoid Cyst Drainage**

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Arachnoid cysts are congenital and usually symptom free lesions of the CNS; they shouldn't be candidate for surgery unless they become symptomatic. To our experience one complication of fenestration of big cranial arachnoid cysts is subdural hemorrhage. The known pathophysiology of bleeding is the bridging veins between the cyst

wall, the dura and the cortex which are notably stretched consequent to decompression of big arachnoid cyst and is exposed to high risk of rupture, so the bigger lesions have higher chance for happening of subdural hematoma of the opposite side. Considering shortness of time of decompression and sudden stretching of the vessels as one significant reason of subsequent bleeding we used a simple technique to lengthen the duration of drainage. Before opening of the dura we inserted a small size angiocatheter into the cyst and let the fluid flow until the pushout pressure is low enough that there is no flow of CSF. In big cyst it can take 20 to 30 minutes; after wards we open the dura and remove the walls of cyst totally. Up to now this technique has been used in 16 patients and in the follow-up of early post-op no hemorrhage was observed. In this article we plan to explain the technique and outcome of recent patients.

Keywords: Arachnoid cyst, Complication, Angiocatheter

EP-0148 [Pediatric Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]**Middle Fossa Arachnoid Cyst: Microscopic/Endoscopic Fenestration; Indications and Outcome**

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Background: Treating middle fossa arachnoid cyst is controversial and reserved to symptomatic cases. Many options include cyst shunting or fenestration. The aim of this study to address the safety and efficacy of both the microscopic and endoscopic technique in treating such condition.

Method: Retrospective study on 19 patients with symptomatic middle fossa arachnoid cyst who underwent cyst fenestration in the neurosurgery department, Mansoura University between 2005 to 2016. Patients underwent cysto-peritoneal shunt or fenestration after shunt insertion were excluded from this study. Pre-operative and post-operative patients' data were evaluated regarding both clinical and radiological outcome.

Results: 11 patients were females and 8 were males. The age ranged from 9 to 25 years. Surgery was indicated for persistent headache (9 patients), seizures (7 cases) and giant cyst (3 cases). Surgery was done microscopically (10 cases) and endoscopically (9 cases). Headache improved in 6 patients. 5 patients became seizure free. Thirteen patients showed radiological cyst regression, two patients had complete cyst resolution. Second surgery for repeated fenestration was done in one case. The cosmetic outcome and hospital stay was shorter in endoscopic compared to the microscopic group. Postoperative morbidity included one case of new onset seizures and another case of subdural hematoma that required evacuation. We had one case of mortality.

Conclusion: Microscopic or endoscopic cyst fenestration is an effective safe procedure for treatment of symptomatic middle fossa arachnoid cyst. Endoscopic cyst fenestration has a shorter hospital stay, minimal blood loss and better postoperative cosmetic outcome.

Keywords: Fenestration, Cyst, Microscopic, Endoscopic

EP-0149 [Pediatric Neurosurgery » Congenital Malformations]**Human Tail: Case Report**

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A 10-months old female patient was referred by a general practitioner for a tail-like protrusion from lumbar region without any associated anomalies. MRI spine showed a tethered cord to a terminal filum fibrolipoma and dermal sinus tract. Our case is a pseudo-tail according to Lin et al classification. Soon after the patient was admitted, he was operated and surgical excision, untethering and dermal sinus tract removal was done without any complication. Management of human tails is basically surgical, however, what differs is the extent of surgery depending on the lesion being a true tail or a pseudo-tail. A true human tail is accepted as a failure of regression in fetal life and so this caudal appendage should be treated as a benign lesion and the treatment is simple excision for cosmetic reasons. On the other hand, a pseudo-tail is generally a cutaneous representation of an underlying associated condition and has a common ectodermal origin with the skin and nervous system. Surgical treatment will include more extensive surgery for both removal of the lesion and untethering of the spinal cord or removing dermal sinus tracts, when necessary.

Keywords: Humain tail, Spina bifida

EP-0150 [Pediatric Neurosurgery » Congenital Malformations]**A Case of a Ventral Cervical Cyst- Arachnoid Cyst**

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Presence of an arachnoid cyst at craniospinal junction is not very common. This is a very rare anatomic site, with only seven other cases reported in the literature. We report a case of large intradural craniospinal arachnoid cyst presenting with obstructive hydrocephalus and cranial nerve palsy. A 39-year-old male presented with 8-month history of neck pain, headache, vomiting, visual disturbances, diminished taste sensation, and numbness of face. He had bilateral papilledema on ophthalmoscopy. Magnetic resonance imaging (MRI) revealed an anterior cervical cyst extending from C1 to C7. Posterior decompression was done through C3 and C4 laminectomy with cyst fenestration. He is having good recovery and is now able to mobilise two weeks after operation. The discussion includes the clinical features, diagnosis, and management of these rare spinal arachnoid cysts.

Keywords: Ventral spinal cyst, Arachnoid cyst, Myelopathy

EP-0151 [Pediatric Neurosurgery » Congenital Malformations]**Blake's Pouch Cyst About 4 Cases and Literature Review**

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Classifications and descriptions of cystic malformations of the posterior fossa are based on the stage of embryonic development, communication or not with the subarachnoid spaces or fourth ventricle, the morphological changes of the posterior fossa and the association with other supra tentorial malformations. Thus, the Dandy-Walker malformation, Dandy-Walker variant, the mega-cisterna magna, the Blake's pouch cyst, the valecula cyst represent stages of development malformations methods. We described in this presentation 4 cases of BPC. The first of a child with hydrocephalus associated with this malformation requiring the establishment of a ventriculo-peritoneal shunt at the age of 40 days. The patient was then readmitted for shunt dysfunction which was revised. The second case is a 4 year old child to whom a Shunt was placed for hydrocephalus associated with the persistence of Blake's pouch. The evolution was marked by a valve dysfunction and further measures were taken (valve revision, external drainage and a ventriculo-atrial shunt) The third of a 29 years old women valved for hydrocephalus associated with Blake's Pouch cyst with good evolution after the VP shunt. The fourth case is a 63 years old woman shunted for a BPC associated with a hydrocephalus with good outcome. The cyst of the pocket Blake is a rare disease the value of radiology in the diagnosis is crucial and the management is still a point of discussion. Blake's pouch Cyst the persistence is a rare malformation of the posterior fossa with a favorable prognosis after surgical treatment

Keywords: Blake's pouch cyst, Dandy Walker malformation, Dandy-Walker variant, The mega-cisterna magna, The valecula cyst, MRI

EP-0152 [Pediatric Neurosurgery » Congenital Malformations]**ETSS for Pituitary Adenoma in Patient with Acromegaly and Intracellular Kissing Carotid**

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Intracranial "kissing" carotid arteries are a rare variant where both internal carotid arteries deviate medially and touch each other near the mid-line, also it can limit surgery options for this area anthologies. This is report of 35 years old man with classic feature of acromegaly (IGF1:899) after MRI study we find out that internal carotids kissing each other in mid-line. reason of this finding was unknown, but most possible reason due to radiologist consult was enlargement of meckle cave because the high signal view in T2 MRI study and other differential diagnosis was cystic lesion in bone. This condition could be dangerous for endoscopic transsphenoidal surgery. But we decide to do this operation with guide of navigation. Tumor removed near total and pituitary gland was saved with no complication and deficit. During surgery, carotids were touching each other but we no complication surgery finished. In follow-up, patient after one year feel completely better. As a conclusion, our investigation suggest that ETSS with guide of navigation can be use safe in patients with vessel anomalies. This experience is not only because of this patient but also in many re-operation cases that carotid were not in suitable region we did this method with no complication.

Keywords: Kissing carotid, Acromegaly, ETSS, Adenoma

EP-0153 [Pediatric Neurosurgery » Congenital Malformations]

Dermal Sinus in Children About 11 Cases and Literature Review

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Background: Dermal sinus is a rare pathology that's encountered in 1/2500 new births/year caused by embryological defect that forms an abnormal tract between the skin and underlying neural structures. Most often located in the lumbosacral region. The diagnosis should be suspected with other skin findings. Complications can be infectious, neurological, orthopedic and vesico-urinary disorders.

Method: Our study focuses on 11 cases of dermal sinus ranging in age from 03 months to 11 years revealed by skin abnormalities. All the patients benefited of an MRI.

Results: There is a 2/1 female predominance. Skin abnormalities in the spinal lumbosacral region are the most frequent by 72.72% of cases, neurological deficits in 27% of cases. It must be distinguished from the very frequent coccygeal pits (4% of newborns), The research associated lesions found: thick filum in 45% of cases; dermoid cyst, intradural abscess, syrinx, hydrocephalus in 27% of cases. The dermal sinus ends most frequently in the dural surface in 72% of cases; in dermoid tumor in 14% of cases; attached to the filum in 14% of cases. The treatment was surgical excision in 100% of cases with good results in 90% of cases and stabilization in 10% of cases.

Conclusion: The dermal sinus is a rare disease, but a neurological examination is required for newborn in search skin abnormalities. Once the diagnosed surgery remains the treatment of choice to prevent installation of neurological or infectious disorders. The prognosis of this lesion is usually good.

Keywords: Dermal sinus, Skin abnormalities, MRI, Surgery

EP-0154 [Pediatric Neurosurgery » Congenital Malformations]

Presentations of Tethered Cord Syndrome

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Background: The standard treatment for tethered cord syndrome that presents after the age of 5 year though adulthood remains controversial.

Method: A prospective comparative case series study was performed. Patients operated at 3 urban tertiary centers in Pakistan for management of spinal cord tethering from December 2011 through December 2014 (n=18) were study subjects.

Results: Among 18 individual (half operated and half not operated during infancy) with equal males and females ranging from age group 6 to 19 years, none had conus level at normal position. Major complaints were Bladder dysfunction (n=15), Back Pain (n=13), Leg pain (n=12). On basis of clinical and MRI diagnosis, majority had tethered cord with Myelomeningocele (2 operated, 4 never operated

in infancy), 4 had tethering with dermal sinus. All of them (n=18) undergone detethering surgery. There was no wound infection but 1 had wound dehiscent and CSF leakage. Neurologic status and outcomes were compared with preoperative findings at 1st and 6th post-operative month in both groups. Hypoesthesia (p=0.04), Fecal incontinent (p=0.001) significantly improved in non-surgical group at 1st and 6th post-operative months respectively. Other neurological parameters although not statistically significant had different outcomes in surgical and non-surgical groups (at infancy). Back pain, leg pain, bladder function improved more in surgery at infancy group than non-surgical group.

Conclusion: A much larger and prospective randomized series is needed to determine the effects of operative management after the age of 5 in patients who had surgery at infancy or who never had surgery.

Keywords: Tethered cord, Detethering, Early

EP-0155 [Pediatric Neurosurgery » Congenital Malformations]

Phenomenological Model of Tethered Cord

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Under physiological loading, the lumbosacral cord protected by unique system with damper elements, that preventing the cord from overstretching. In spinal flexion/extension the spinal cord adapts to the varying length of the canal by elastic deformation. Prolonged loading of spinal cord which exceeds the physiological limits (tethered cord condition) leads to plastic (irreversible) deformation, that results spinal cord damage, i.e. neurologic impairment. Proposed model consider tethered cord as three-dimensional state of stress of the lumbosacral cord. Overstretching lumbosacral cord develops as a result of it stretching between terminal filum and lowest pair of dentate ligaments. According to our phenomenological model, both the distal part medullary cone and the lateral surface of lumbosacral cord in the point of the lowest dentate ligaments attachments are zone of the maximum stress and strain. Taking into account the anatomical features of lower urinary tract innervation, the proposed model allows to explain the obligatory bladder dysfunction in patients with tethered cord (clinical or instrumental). Depending on the localization, of congenital lumbosacral disorder, and therefore stress distribution, to varying degrees maybe affected sacral micturition centers and thoracolumbar segments T11-L2 (sympathetic innervation). In the conditional cross section of the lumbosacral cord the stress (and deformation) decreases from the periphery to the center Taking into account the structural organization of the spinal cord, our model explains motor deficit occurs early sensory From the biomechanical point of view, tethered cord lead to irreversible changes in lumbosacral cord. The proposed model may be a rationale for early tethered cord correction.

Keywords: Tethered cord, Spinal cord deformation, Phenomenological model of tethered cord, Bladder dysfunction

EP-0156 [Pediatric Neurosurgery » Congenital Malformations]**Filum Terminale Lipoma's About 17 Cases and Literature Review**

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Background: Filum terminal lipomas are being identified with increasing frequency due to the use of modern imaging (MRI). It is a benign pathology when asymptomatic. Surgical untethering is the treatment. Its incidence is unknown, it had been estimated to be approximately 0.1%. Surgical intervention in pediatric neurosurgery is increased during the last two decades. Tethered cord syndrome may be due to thickened and fatty structural elements within the filum terminale that render it appropriately tense preventing normal stretch and movement.

Method: We study the clinical and imaging for 17 patients, this filum was associated to other pathologies in 41.17% of cases: Diastematomyelia, Lipomyelomeningocele, Dermal Sinus, Myelomeningocele. Clinical findings were mainly the Cutaneous stigmata and the orthopedic deformities and less frequently urinary disorders. 29.41% of patients were asymptomatic. All patients were explored with MRI. A medullary CT scan was performed in 58.82% of cases.

Results: All patients were operated between 2010 to 2016. Evolution was favorable in 8 cases, stabilization in 7 and aggravation in 2 patients.

Conclusion: Filum terminal lipomas are a common incidental finding on lumbar spinal MRI. Surgery is the best option. Evolution after surgery is generally good.

Keywords: Filum terminal lipomas, MRI, Tethered cord syndrome, Surgery

EP-0157 [Pediatric Neurosurgery » Congenital Malformations]**A Case of Trigenocephaly Treated Using the 'Floating Forehead' Technique**

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Trigenocephaly is a form of craniosynostosis, defined as the premature fusion of the cranial sutures. It is less frequently encountered than other types of synostosis and is formed as a result of the premature fusion of the metopic suture. It is a craniofacial anomaly characterized by tapering in the forehead region, decreased frontobasal angle, and narrowed bitemporal distance. In addition, it is accompanied by hypotelorism in varying degrees. The primary goal of surgery is to remove the triangular shape which is seen in the midline and to prevent an increase in intracranial pressure. The most suitable time for surgery is between 3 and 6 months. Although a variety of surgical techniques may be employed, in trigenocephaly cases, the 'floating forehead' technique accompanied by supraorbital rim osteotomy is the most advisable. A 7-month-old child, was brought to our clinic with tapering in the forehead and

hypotelorism. The results of the 3D CT scan showed fusion of the metopic suture and an advanced case of hypertelorism. The patient underwent surgery. The bilateral frontoparietotemporal bone flap was removed as a single piece by a bicoronal incision in the skin. A supraorbital rim osteotomy was then performed. Remodelling was achieved with multiple osteotomies on the frontoparietotemporal bones and by breaking the supraorbital rim in the middle. The flap was repositioned following bone remodelling. A number of surgical methods have been identified for cases of trigonocephaly. In particular, in addition to the remodelling of the skull by bilateral frontoparietotemporal osteotomy, the 'floating forehead' technique, which includes supraorbital rim osteotomy, should definitely be performed.

Keywords: Trigenocephalus, Floating Forehead, Surgery

EP-0158 [Pediatric Neurosurgery » Congenital Malformations]**An Uncommon Anomaly in Live Births: Holoprosencephaly**

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Holoprosencephaly (HP) is a structural anomaly that is accompanied by craniofacial anomalies at 80% and results in complete or inadequate separation of the forebrain in the early gestational period. A female child was born at 32 weeks gestation. The family was informed about the anomaly in ultrasound (USG) examinations performed during pregnancy but the family did not accept therapeutic abortion. She was hospitalized in the neonatal clinic of our hospital due to cleft lip and palate, microcephaly, and respiratory failure. In brain magnetic resonance imaging (MRI), alobar holoprosencephaly was detected. The patient had no interhemispheric fissure and the corpus callosum. Both cerebral hemispheres were united and there was a single ventricle. Multiple congenital anomalies were determined on physical examination of the patient. These included cleft palate and lips, deficiency of the nasal bridge, hypertelorism, and microcephaly. The incidence of HP is 1/16,000 live births. As a result of a division failure in human embryonic life, it leads to severe anomalies in both the face and central nervous system. Single ventricle is seen and the brain is smaller than average. In lobar HP there is no corpus callosum, falx cerebri, optic chiasm, and olfactory bulbs. The midbrain and brain stem are normal. It is very rare for a fetus with alobar HP to live up to term period. For the prevention of such fatal anomalies, a careful examination of neuronal structures is very important when USG is performed in the intrauterine period.

Keywords: Congenital anomalies, Cranio Facial malformations, Holoprosencephaly

EP-0159 [Pediatric Neurosurgery » Congenital Malformations]**Management of Life Threatening Intraoperative Complications of Cranial Expansion Surgery in Complex Syndromic Craniosynostosis**

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Background: We describe our management of life threatening intraoperative complications of cranial expansion surgery in Crouzon and Apert Craniofacial deformities children who developed malignant brain swelling secondary to hypercapnia secondary to ventilation failure and massive hemorrhage with intracerebral hematoma.

Case 1: One-year-old boy, a Crouzon Syndrome with complex Craniosynostosis, on permanent tracheostomy tube, was complicated by intraoperative brain swelling and severe hypercapnia due to mechanical ventilation failure. Decompression of GIT tract was done and reconstruction procedure was completed but developed severe bilateral chemosis and multiple corneal ulceration requiring tarsorrhaphy of right eye and daily dressing.

Case 2: A 3 year-old girl, an Apert Syndrome with complex Craniosynostosis underwent Fronto-orbital Advancement and Cranial Vault Reshaping, developed 2 episodes of cardiac arrest following massive blood loss during the elevation of scalp and bone flap. Further reconstructive procedure was abandoned as the child developed malignant brain swelling. She was treated in intensive care unit with cerebral protection and medical therapy and subsequently underwent Craniotomy evacuation of frontal intracerebral hematoma on postoperative day 2 and delayed reconstruction on day 5.

Results: Both patients recovered gradually and improved functions with minimum follow-up of 2 years. The boy with severe chemosis eventually recovered in 4 months but still on permanent tracheostomy while waiting for corrective procedure for the airways obstruction.

Conclusion: Severe complications related to complex syndromic Craniosynostosis cranial expansion surgery could be fatal. A dedicated multidisciplinary team with vast experience is therefore needed to ensure safety, improved cosmesis and functional outcome.

Keywords: Syndromic craniosynostosis, Complications, Cranial expansion surgery

EP-0160 [Pediatric Neurosurgery » Congenital Malformations]**Craniosynostosis: Clinical Presentation, Surgery and Literature Review**

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Craniosynostosis is a premature ossification of skull's sutures and its effects on the shape and appearance of the head was first reviewed in 1858 by Virchow, who named it. When there is abnormal

configuration of the skull, radiological evaluation must be done in order to characterize the deformity and to guide surgical or clinical corrective procedures. It is known that a significant improvement can be seen in children with early diagnosis and surgical intervention. Simple X-Ray associated with a Computed tomography 3-D reconstructions allow the evaluation of the degree of involvement of each suture and associated facial and intracranial anomalies. In this review we illustrate the image findings and the nomenclature and the anomalies associated with the several types of primary craniosynostosis, its clinical presentation, the effects and indication of surgical treatment in special looks at the surgical indication – clinical or aesthetics.

Keywords: Craniosynostosis, Clinical presentation, Surgery and literature review

EP-0161 [Pediatric Neurosurgery » Congenital Malformations]**Accessory Inferior Limb: About a Case**

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Accessory limb associated with spina bifida, are extremely rare anomalies. An accessory limb associated with spinal bifida was first reported by Jones in 1889. Our case is a 4-months-old female infant delivered by Cesarean section at 37 weeks of gestation and was referred to our department with a diagnosis of accessory limb. On physical examination Spinal reflexes, such as withdrawal to pain, were present in the accessory limb. The limb resembled to a normal leg, ending with a rudimentary foot containing only three toes. The normal legs presents a complete paraplegia. Magnetic resonance examination of the spine disclosed a lumbosacral lipomeningocele. The limb was removed after ensuring that there was no deep connection to the bony skeleton without complications. Although rare, several cases have been described of infants born with accessory limbs. The rupture of the neural tube is hypothesized to disperse and infiltrate mesodermal tissues leading to anomalous development. The fact that several cases of dysraphic appendage have been reported occurring with skin-covered lesions of secondary neurulation added weight to this hypothesis.

Keywords: Accessory limb, Malformation, Spina bifida

EP-0162 [Pediatric Neurosurgery » Congenital Malformations]**Spinal Intramedullary Hamartoma with Acute Presentation in a 13-Month old Infant: Case Report**

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True hamartomas of the spinal cord are very rare, and although several have been reported in the literature, there are few detailed radiological and pathological descriptions of the condition. There is also considerable overlap with other entities, the most common being spinal cord teratomas. The authors report the case of a 13-month-old child with a supragluteal sacral dimple who presented

with acute neurological deterioration. MRI of the spine revealed a big intramedullary lesion with heterogeneous signal intensity. A near-total resection was performed, and histopathological examination demonstrated findings consistent with a spinal cord hamartoma. The authors believe that careful preoperative evaluation and rigorous pathological examination are mandatory to establish diagnosis and direct further management of cases in which such a lesion is suspected.

Keywords: Hamartoma, Teratoma, Spinal cord, Spine, Oncology

EP-0163 [Pediatric Neurosurgery » Congenital Malformations]

Lipomyelomeningocele, A Very Rare Congenital Birth Defect in Benin City, Nigeria: A Case Report and Review of Literature

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Lumbosacral Lipomyelomeningocele is a rare congenital birth defect. Only one of such has been seen in the 10 years of existence of neurosurgery in our institution. A case of a 10-month old boy with fatty protrusion from the lower back since birth with delayed gross motor lower limb developmental milestone. After a magnetic resonance image of the lumbosacral region, a diagnosis of lipomyelomeningocele was made. The patient had excision of the mass, untethering of the cord and repair of dural defect under general anaesthesia. He was discharged home without further neurological deficit after spending 2 weeks in the hospital. This report illustrates the successful management of lipomyelomeningocele, a rare neurological anomaly in our environment.

Keywords: Lipomyelomeningocele, Congenital birth defect, Untethering of the cord

EP-0164 [Pediatric Neurosurgery » Congenital Malformations]

Do We Need to Do Cranial Radiological Screening in Children with Occult Spinal Dysraphism to Investigate Coexistent Cerebral Abnormalities? A Single Center Retrospective Case Series

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Background: Spinal dysraphism (SD) is a wide spectrum of congenital abnormalities associated with neural tube closure defects. Whereas open spinal dysraphisms (spina bifida aperta, SBA) are known as frequently associated with cranial abnormalities such as Chiari malformation type II, hydrocephalus, or cortical dysgenesis; closed spinal dysraphisms (spina bifida occulta, SBO)

are thought less associated with cranial disorders. We aimed to reveal the frequency of cranial abnormalities accompanying to SBO, and if we need to occupy in doing radiological cranial screening with MRI in addition to the relevant level for investigation of coexistent pathologies.

Method: We retrospectively collected the data of 76 pediatric patients who had been operated in our clinic due to SBO, and had been analyzed for coexistent craniospinal abnormalities preoperatively with magnetic resonance imaging (MRI).

Results: All patients had one or more types of SBO, and MRI screening of whole spinal axis, yet only 64 of these patients had cranial MRI screening. Among 64 patients with cranial screening, only 2 patients had one occipital encephalocele and one posterior fossa arachnoid cyst. There were found neither hydrocephalus nor Chiari malformation in our case series.

Conclusion: We recognized high frequency of spinal abnormalities accompanying to SBO, whereas cranial findings rarely coexisted with SBO. Therefore, we strongly suggest the radiological screening of whole spinal axis in occult spinal dysraphism, while the necessity of cranial imaging was suspicious according to our results, and further studies are needed.

Keywords: Spina bifida occulta, Spinal dysraphism, Closed neural tube defects, Split cord malformation, Tethered cord syndrome

EP-0165 [Pediatric Neurosurgery » Congenital Malformations]

Management of Early Adulthood Myelomeningocele

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The incidence of myelomeningocele cases is still high in Sudan. Myelomeningocele is a common birth defect that is associated with significant lower extremities deformities and disabilities that causes significant lifelong morbidity. However the late presentation of a myelomeningocele beyond childhood is very rare to our knowledge and no similar cases have been reported before. We reported 2 cases of late presentation the first case was 12 years old female a case of neglected sacral myelomeningocele associated with Chiari malformation presented with back swelling since birth and urine incontinence. The patient underwent myelomeningocele repair and release of the hanging nerve roots then the defect closed through the classic three layers closure. The patient recovered completely and regained her ability to control her urine immediately in the first postoperative day. The second case was 14 years old having both hydrocephalus and lumbosacral myelomeningocele. He presented complaining of both urine and fecal incontinence beside gait disturbance. He was operated in 2 steps first with VP shunt placement for the hydrocephalus then myelomeningocele repair. Postoperatively he regained both sphincteric control. The cases illustrate that myelomeningocele is not a cause of mortality even if it was associated with hydrocephalus. The sphincteric disturbance in these patients seems to be caused by Chiari malformation rather than by the hanging lower nerve roots. The stepwise repair by treating the associated hydrocephalus then repairing the defect by detethering the neural tissue may be adequate to obtain good outcome.

Keywords: Neglected myelomeningocele, Adult presentation, Surgical repair, Sacral myelomeningocele

EP-0166 [Pediatric Neurosurgery » Congenital Malformations]**Characteristics of the Surgical Tactic of the Neural Tube Defects Treatment**

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Background: Nowadays congenital malformations of neonates still remain to be challenging medical, social, and ethical issues, and neural tube defects (NTD) are among the most common of them. Our aim is to improve the treatment of children with congenital NTD.

Method: 183 children with NTD have been treated along three years in our clinic. 54 patients (29.5%) had the liquorrhea at the admission and 65 (35.5%) children were under its threat. These 119 (65 %) patients underwent urgent surgical treatment, while the others – the routine one.

Results: The basic principles of spinal herniation surgery are the removal of hernia sac, restoration of dura mater and soft tissues integrity around hernia, and the release of a spinal cord fixation. Urgent and routine surgery approaches for this NTD is almost the same, though the routine surgery has more benefits such as enough lead time for the detailed preoperative examination and thorough planning of the surgical treatment. The algorithm of diagnostics and therapy of children with the congenital NTD depends on the integrity of the hernia sac, liquorrhea presence, and the severity of concomitant hydrocephalus. In case of spina bifida combined with the progressing hydrocephalus both dysraphia and shunting surgery were performed. If simultaneous operation was associated with the extreme risk, liquor shunting has been performed first, and after a few days hernia has been removed (or vice versa).

Conclusion: The algorithm of diagnostics and therapy depends on the NTD character and requires individual approach in every single case.

Keywords: Surgery, Neonates, Malformations, Neural tube

EP-0167 [Pediatric Neurosurgery » Congenital Malformations]**Remodeling Surgical Technique in Craniosynostosis; Concerning 30 Cases**

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Background: Craniosynostosis is a pathology related to a premature welding of one or more cranial sutures. This causes specific stirrs on the morphologic, brain, and ophthalmic levels. The syndromic Craniosynostosis are associated to a faciostynosis of variable severity requiring also a correction for morphologic, ventilator, or ophthalmic reasons.

Method: We report 30 cases operated between 2013 and 2016, of which 26 cases was non-syndromic Craniosynostosis cases (8 cases of plagiocephaly, 13 cases of scaphocephaly, 4 cases of brachycephaly and one case of trigonocephaly), 4 cases of syndromic

Craniosynostosis (3 cases of Crouzon's syndrome and one case of Apert's syndrome). The age varied from 8 months and 4 years, of which 18 girls and 12 boys.

Results: 27 patients out 30 presented satisfactory results. Two children was considered unsatisfactory, regarding the late age at the intervention, the decompression and remodeling of the skull permitted a significant improvement. The follow up was narrowed all along the ossification phase. The premature closure of one or more skull sutures leads to a growth trouble leading to an ungainly deformity and a neurologic risk. The authors prescribe an early surgery before 12 months. The surgery results was positive, complications was rare but serious.

Conclusion: The surgical treatments are adapted to each type of Craniosynostosis and each age. The best care is generally located between 3 and 12 months. The Craniosynostosis surgery is a good example of interdisciplinarity.

Keywords: Craniosynostosis, Apert's syndrome, Crouzon's syndrome

EP-0168 [Pediatric Neurosurgery » Congenital Malformations]**Effectiveness of Two-Layer Plastics of Spinal Canal on Congenital Spinal Hernias**

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Aim: To analyse the results of surgical treatment of congenital spinal hernia comparing traditional method and the method of two-layer plastics of posterior wall of spinal canal (TLPPWSC).

Method: 98 patients with CSH in age from 2 days to 12 years who were hospitalized in the Department of Neurosurgery of Samarkand State Medical Institute and Samarkand multidisciplinary regional children's hospital in 2004-2016 years. Out of 83 operated patients 42 (group 1) underwent widespread method of plastic of posterior wall of spinal canal with musculo-facial flap and 41 patients (group 2) underwent a new technique - TLPPWSC.

Results: A new technique - TLPPWSC carried out as follows: - cut out the flaps of the musculo-aponeurotic tissue side, both sides are rotated 180° turn and sewn tightly and sealed to each other. Near-term and long-term results of surgery indicate that the modified TLPPWSC has a number of advantages over traditional. Liquorrhea postoperatively observed in the second group is 2 times less than in the first, respectively the intracranial pyo-inflammatory complications (meningitis, meningoencephalitis, etc.) were observed in the modified group is less than 1.5 times, compared with 1st group.

Conclusion: Thus, TLPPWSC with musculo-aponeurotic flap is more efficient, contributing to the reduction of various postoperative complications in congenital spinal hernias.

Keywords: Congenital hernias, Two-layer plastics, Liquorrhea

EP-0169 [Pediatric Neurosurgery » Congenital Malformations]

Management of the Giant Occipital Encephaloceles in the Neonates

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Background: Occipital encephalocele (OA) are described as giant when they are larger than the head from which they arise.

Method: Four giant OA were admitted to hospital from November 2012 to January 2016. All neonates were female. The clinical symptoms, radiological features, operative approaches, preoperative care, intraoperative findings, postoperative management and prognosis were noted prospectively. In one neonate, where there was no cerebral and cerebellar tissue, repair was closure after excising the sac. In one neonate, there was an occipital lobe, occipital horns of ventricles, cerebellar hemisphere, posterior cerebral artery and basilar artery into the sac, which was partially excised and the rest was repositioned gently into the cranial cavity. In the remaining two neonates, the herniating occipital and cerebellar tissue were not resected but the herniating brain was pushed gently into the cranial cavity. Duraplasty were done with a galeal greft. Cranioplasty were not performed.

Results: The mean gestational age was 37.2 weeks. The mean birth weight was 3235 g. The mean size in sacs were 16.5x20.5 cm. The mean age at the time of surgery was 5 days. The mean follow-up period was 30.5 months. There were no mortality, wound problems, and CSF leakage. Third ventriculostomy was performed for hydrocephaly in one patient. Children were assessed by the Denver Development Screening Test-II for psychomotor delay. Mental and motor development was satisfactory in 2 and poor in 2 patients.

Conclusion: The management of cases involvement by a multidisciplinary team including neurosurgeon, pediatrician, and anesthesiologist. Careful planned and early meticulous surgery results in a satisfactory outcome.

Keywords: Encephalocele, Giant encephalocele, Neonate, Occipital encephalocele

EP-0170 [Pediatric Neurosurgery » Congenital Malformations]

Surgical Management of Limited Dorsal Myeloschisis Associated to CNS Anomalies: Case Report with Special Consideration for Syringomyelia

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Limited dorsal myeloschisis (LDM) is a distinctive form of spinal dysraphism with a featured surgical management. Several central nervous system congenital anomalies may be associated. We present a case of Cervico-dorsal LDM associated with Syringomyelia, Chiari II malformation and Hydrocephalus. being based on our case, We recall the Management of the LDM malformations going through a peroperative video recording and highlights the management

of the associated anomalies with special consideration to the syringomyelia.

Keywords: Limited dorsal myeloschisis, Spina bifida, Hydrocephalus, Syringomyelia, Pathophysiology

EP-0171 [Pediatric Neurosurgery » Congenital Malformations]

Management of Ruptured Temporal Arachnoid Cyst into Subdural Space with Hematoma

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Management in emergency of subdural hematoma due par ruptured of arachnoid cyst. Intracranial arachnoid cyst in relation to the cerebral hemisphere and middle cranial fossa are usually asymptomatic. Rarely posttraumatic or spontaneous rupture can result intracystic heamorrhage, subdural hematoma or subdural hygroma. We present a case of a 16 year old boy with a history of benign head trauma. Who presented three months later signs and symptoms of increased intracranial pressure (GCS: 14, vomiting, headaches, VI nerve palsy). The CT scan and MRI showed subdural hematoma in left due to a ipsilateral arachnoid cyst type II of Galassi. We first performed evacuation of the subdural hematoma after the marsupialisation of the cyst. The patient had clinically and radiologic good outcome at three months control.

Keywords: Arachnoid cyst, Subdural hematoma, Head trauma

EP-0172 [Pediatric Neurosurgery » Congenital Malformations]

Entrapped Temporal Horn

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Entrapped temporal Is a rare pathologic condition was described by Cairns et al in 1947. It is due to an obstruction of the trigone of the lateral ventricle. diverse group of conditions which result from impaired circulation and resorption CSF have role in this pathophysiology is often present with. headache, seizures, hemiparesis and visual field deficits. treatment of choice of these condition is still controversial. We are reporting a case of 16 years old boy with chief complain of Headache, In checkup for sinusitis in CT-scan Accidentally entrapped temporal horn diagnosed. For treatment surgery did by Temporal craniotomy and opening the ambient cistern through choroidal fissure, post op CT show decreasing size of cyst and all sing and symptoms gone away and there was no extra deficit as a surgery complication. But acute severe Headache presented 2 months after surgery, CT-Scan did and it was subdural hygroma that because of the severity of headache second operation did for subduropritoneal shunt. In 10 month follow up patient had no sign and symptoms and according to our experience

and previous literature it seems that Treatment strategy depends on condition of patient and cause of ETH, Adequate surgical treatment consists of reestablishing connection to the CSF pathway or drainage of the trapped temporal horn via a shunt in other hand Endoscopic temporal ventriculocisternostomy is seems to be an effective and safe option in the treatment but our investigation suggest that shunt is best option.

Keywords: Temporal horn, Shunt, Entrapped

EP-0173 [Pediatric Neurosurgery » Congenital Malformations]

The Importance of Skin Lesions on the Diagnosis of Split Cord Malformations

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Background: Split cord malformations (SCMs) are the rare congenital anomalies of the spine which are usually diagnosed and treated in early childhood. Although numerous cutaneous lesions have been described that may occur with SCMs including abnormal hair growth, hemangiomas, telangiectasias, pigmentation anomalies, subcutaneous mass lesions, and dermal sinus tracts, there is no study demonstrating the correlation between the skin lesions and the type of SCM. The aim of this study is to determine the correlation between the skin markers and type of SCM in adults.

Method: The data of 14 patients with SCM in 6 years-period were reviewed retrospectively. The type of skin lesion on admission, the radiological findings and treatment methods were recorded.

Results: Seven patients (50%) had SCM type I and the others (50%) had type II. Hypertrichosis was present in 11 (79%) of the 14 patients. Faun tail was observed in 6 patients (86%) who had SCM type I. Silky down was the skin lesion among 5 patients, 4 of whose malformation was type II (80%) and the other type I (20%). The correlation between the type of SCM (Type I or II) and the skin lesion (Faun tail or silky down) was statistically significant ($p \leq 0.05$). There is a statistically significant correlation between the type of hairy patch and the type of SCM.

Conclusion: Faun tail is associated with type I SCM and silky down is associated with type II SCM. The neurosurgeons should be familiar with the skin markers of SCMs as it can be easily overlooked by physicians.

Keywords: Split cord, Surgery, Skin lesion

EP-0174 [Pediatric Neurosurgery » Congenital Malformations]

Factors Affecting Infection Development After Meningomyelocele Repair in Newborns and the Efficacy of Antibiotic Prophylaxis

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Aim: To evaluate the clinical and surgical variables that may be associated with wound infection and meningitis/ventriculoperitoneal (VP) shunt infection in newborns diagnosed with meningomyelocele (MMC).

Method: The data of 91 neonates diagnosed with MMC, who underwent surgical intervention between May 2012 and December 2014, were retrospectively evaluated. Multivariate logistic regression analysis was used to determine the possible clinical and neurosurgical variables associated with meningitis/VP shunt infection and surgical wound infection.

Results: Following MMC closure, of the 91 neonates, 18 (16.4%) developed meningitis/shunt infection and 12 (11%) developed surgical wound infection. The operation time was not a significant independent risk factor for the development of meningitis (RR0.618[0.199-1.922], $p=0.406$). Open neural placodes that were not covered by any pseudomembrane (myeloschisis), external ventricular drainage (EVD) use, and flap transposition were determined as significant relative risk factors for the development of meningitis. Deep surgical wound infection was not correlated with the operation time or wound surface area. However, there was an intermediate but very significant positive correlation between meningitis and cerebrospinal fluid (CSF) leakage, length of hospitalization, and flap transposition ($r=0.377, 0.420, 0.357$, and 0.503 , respectively; for all values, $p < 0.001$).

Conclusion: There was no association between MMC closure and development of infection. Since it carries a high risk for the development of meningitis, the EVD system should be avoided unless necessary. Routine prophylactic antibiotic use did not reduce the infection risk in MMC repair surgery. Thus, antibiotics should not be used if there are no risk factors predisposing to infection.

Keywords: Meningomyelocele, Shunt infection, Prophylactic antibiotics, Newborn

EP-0175 [Pediatric Neurosurgery » Congenital Malformations]

Hemispheric Cerebral Mature Teratoma in New Born

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Teratoma is congenital tumors composed of an admixture of different tissue types representative of ectoderm, endoderm and mesoderm. Their intra intracranial location is rare. They preferentially arise in the midline structures, and more diagnosed in pediatric population. We presented an unusual case of a huge mature intracranial teratoma in a female newborn who presented with enormous macrocranium, lethargic state and ocular disturbance. In MRI, the lesion occupied the place of the totality left hemisphere and deformed the normal cerebral structures. The patient underwent great total resection of the tumor after two stages. On per surgery the tumor was lobulated, containing heterogeneous solid and cystic components. Histologic study has established the diagnosis of mature teratoma. Follow-up at 3 months did not show any evidence of recurrence.

Keywords: New born, MRI, Two stages, Mature teratoma

EP-0176 [Pediatric Neurosurgery » Congenital Malformations]**Diastematomyelia in Children About 12 Cases and Literature Review**

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Background: Diastematomyelia or split cord malformation (SCM) is an uncommon dysraphic lesion of spine in which a part of spinal cord is split in a longitudinal direction by the presence of an osseous, or fibrous septum into 2 hemicords.

Method: During a period of 6 years (2010-2016) 12 cases of SCM were treated, there were 9 cases of type I and 3 cases of type II SCM. The age of our patients was between 2 and 14 years all patients were symptomatic. Orthopedic deformity of spine was recorded in all patients (scoliosis, Kyphosis) Cutaneous stigmata were found in 10 cases. All our patients were explored with an MRI and Medullary Scan.

Results: It is a rare pathology that accounts for approximately 5% of all spinal defects, symptoms are usually those of tethered cord and are in relation with the type of diastematomyelia (type II are minimally affected or entirely asymptomatic). The presenting symptoms may include: leg weakness, low and back pain, scoliosis, incontinence and cutaneous stigmata. MRI coupled with CT scan is preferred to determine its type. Surgery is the main treatment. Improvement was noticed in 41.67% of all patients stabilization in 41.67% and aggravation 16.66%.

Conclusion: Diastematomyelia is an exceptional form of spinal dysraphism (spina bifida occulta). In all cases of progressive scoliosis MRI must be carried out MRI and CT scan have dramatically improved, the accurate diagnosis surgery is undertaken to stop the long term evolution.

Keywords: Diastematomyelia, Dysraphic lesion, Scoliosis, Kyphosis, Cutaneous stigmata

EP-0177 [Pediatric Neurosurgery » Congenital Malformations]**Quality of Life in Individuals Surgically Treated for Congenital Hydrocephalus During Infancy. An Institutional Experience**

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Aim: To assess the quality of life after surgical treatment for primary congenital hydrocephalus (CH) during infancy in a developing country.

Method: This was a retrospective cohort study, with children < 1 year who had undergone surgery for CH. Hydrocephalus Outcome Questionnaire (HOQ) was used after permission. Score ranges from 0.00 (worse health status) to Score of 1.00 as (better health status). Continuous data is presented as Means \pm Standard Deviation or median while categorical data as frequencies and proportions. Non parametric tests including Independent sample Mann-Whitney U-test, and Kruskal-Wallis. p-value \leq 0.05 taken as significant.

Results: 90 patients were included, 40 (44.4%) were male. Mean age at first admission was 6.2 ± 10.0 months. Mean follow up was 5.36 ± 4.45 years. Median length of stay was 17 days. 28 patients had died after surgery. Shunt infection ($p = 0.012$) and delayed milestones ($p = 0.003$) were analyzed to be factors affecting mortality. Parents of surviving 62 patients filled the HOQ questionnaire. Mean HOQ physical health score (0.68 ± 0.30), mean social-emotional health score (0.66 ± 0.32), mean cognitive health score (0.70 ± 0.28) and mean overall health score (0.67 ± 0.30). Age between 1-6 months affects overall health ($p = 0.039$). Delayed milestones had statistically significant relation with social, cognitive and overall health outcomes ($p = 0.025, 0.009$ and 0.060). Number of re-operations were significantly related to cognitive health outcomes ($p = 0.012$).

Conclusion: Social health score was lower than QOL scores indicating greater social burden. Delayed milestones, seizures and re-operations were associated with worst overall outcome affecting different QOL aspect.

Keywords: Congenital, Hydrocephalus, Quality of life

EP-0178 [Pediatric Neurosurgery » Congenital Malformations]**Occipital Meningoencephalocele: Two Case Reports**

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Occipital meningoencephalocele is a very rare type of neural tube defect. Despite the surgical management, prognosis remains poor with an extremely high risk of mortality and morbidities including mental and/or physical impairment. We report two cases of occipital meningoencephalocele presented in two newborn girls who underwent surgical excision. Case 1: A term female baby was delivered by caesarean section from a poorly monitored pregnancy. On examination, she was found to have a large skin covered mass protruding from the occipital area. A cranial defect in the occipital area was seen. On palpation, soft tissue was felt within the mass. There was other associated congenital defect: club foot and flexion deformity of the hip, without motor deficit of 4 members, nor macrocrania. MRI revealed a large defect in the occipital bone with extra-axial fluid, meninges, brain matter and ventricles entering the defect. A reparative surgery was performed at the age of 18 days. Postoperatively, she had uneventful recovery. Case 2: A term female baby was delivered by caesarean section from a poorly monitored pregnancy. On examination, she was found to have a large skin covered mass protruding from the occipital area. A cranial defect was seen. On palpation, soft tissue was felt within the mass. There was no other associated congenital defect. MRI revealed a large defect in the occipital bone with extra-axial fluid, meninges, brain matter and ventricles entering the defect. A reparative surgery was performed at the age of 53 days. Postoperatively, she had uneventful recovery.

Keywords: Occipital meningoencephalocele, Malformation, Surgery

EP-0179 [Pediatric Neurosurgery » Congenital Malformations]**Lumbar Teratoma Associated with a Lumbar Myelomeningocele in a 2 Months Old Girl and Literature Review**

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Teratomas are rare tumors that develop usually at the sacrococcygeal region. Lumbar region is so exceptional. Although most of these tumors are benign, they may grow quite large. They are likely to be congenital and most are discovered before birth by a routine prenatal ultrasound examination. In rare cases, they may be malignant at birth. Once diagnosed, always require surgical removal. We report the case of 2 months girl with a Spina Bifida associated with a lumbar masse diagnosed during pregnancy. Clinical presentation was mainly represented by the myelomeningocele with a lateral masse containing an eye and lips like form. The patient was explored with an MRI, Ultra sounds and simple radiography. Associated malformations were also noted: orthopedic deformity of the foot and hydronephrosis. The patient was operated at the age of 3 months with good post-operative results. Histology was in favor of a teratoma. The association of teratomas and spinal malformations such as spina bifida, partial sacral agenesis, hemivertebrae, and diastematomyelia has been described in the literature. Teratoma usually arises from one or more germ layers. They are most commonly found in the sacrococcygeal region and have a female preponderance. Lumbar localization is rare. Accompanying a spinal dysraphic state, the teratoma may support the idea of a tumor actually arising from a dysraphism and growing outward to produce the mass. Teratomas are generally benign tumors. They should be diagnosed and managed aggressively because they have a great tendency to progress toward malignancy.

Keywords: Teratoma, Lumbar, Myelomeningocele, Spinal malformations

EP-0180 [Pediatric Neurosurgery » Congenital Malformations]**Dilemmas in Schizencephaly: A Case Series**

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Schizencephaly is a rare congenital disorder of cerebral cortical development. The defect is characterized by the presence of cleft in the brain extending from the surface of the pia mater to the ventricles. There are two types of schizencephaly: Type I (closed lip) which does not communicate with ventricles and type II (open lip) which communicates with ventricles. Clinical presentation is mainly epilepsy. In very few cases clinical signs of intracranial hypertension are present. Schizencephaly is generally managed conservatively. Surgical treatment is considered in cases with intracranial hypertension. We present 3 cases of schizencephaly. The first case

was a 3-y-o with generalized seizures and mild mental retardation. Imaging revealed a parietal schizencephaly type I. Treatment with anticonvulsant therapy was successful. The second case was a 10-y-old who presented an acute intracranial hypertension and intractable seizures. Imaging revealed a schizencephaly type II with subdural fluid collection. He was treated by subdural-peritoneal shunt. The 3rd case was an 8-m-old with increase of cranial circumference and schizencephaly type II. The patient was first treated by endoscopic ventricular fenestration but ineffective and finally underwent a shunt which was successful. Schizencephaly is a rare disorder which is generally managed conservatively. Diagnosis may be difficult to do especially in type II; this may lead to inappropriate management. Best surgical treatment for cases with intracranial hypertension is shunt. Strict follow-up of patients particularly with type II is recommended to detect subtle signs of increase of intracranial hypertension and to manage surgically these patients before fatal issue.

Keywords: Schizencephaly, Subdural collection, Shunt

EP-0181 [Pediatric Neurosurgery » Congenital Malformations]**A Single Center Experience of CNS Anomalies or Neural Tube Defects in Patients with Jarcho Levin Syndrome**

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Jarcho-Levin Syndrome (JLS) is a genetic disorder characterized by distinct malformations of the ribs and vertebrae, and/or other associated abnormalities such as neural tube defect, Arnold-Chiari malformation, renal and urinary abnormalities, hydrocephalus, congenital cardiac abnormalities, and extremity malformations. The study included 12 cases at 37-42 weeks of gestation and diagnosed to have had JLS, Arnold-Chiari malformation and meningomyelocele (MMC). All cases of JLS had Arnold-Chiari type 2 malformation; there was corpus callosum dysgenesis in 6, lumbosacral MMC in 6, lumbal MMC in 3, thoracal MMC in 3, and holoprosencephaly (HPE) in 1 of the cases. With this paper, we wanted to underline the neurologic abnormalities accompanying JLS and that each of these abnormalities is a component of JLS.

Keywords: Jarcho-Levin Syndrome, Neural tube defect, Arnold Chiari type 2, Newborn

EP-0182 [Pediatric Neurosurgery » Congenital Malformations]**Occipital Encephalocele: A 15-Year Mono-Institutional Study**

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Background: Occipital encephalocele is a rare congenital malformation caused by the failure of the neural tube to close completely during fetal development.

Method: We retrospectively reviewed 20 cases of occipital meningoencephalocele, operated in department of Neurological surgery of Fattouma Bourguiba University Hospital during the last 15 years.

Results: The incidence of occipital encephaloceles is 20.4%. The average age was 4 months and 26 days. The sex ratio was 0.6. The socio-economic level was low in 70% of cases. The average maternal age was 27.8 years. All infants were born of poorly-attended pregnancy. Prematurity was present in 45% of cases. The average size of the malformation was 4.75 cm and in 45% of the cases the size was greater than 10 cm. CSR leak was present in 10% of cases. Others malformations were present in 75% of cases: hydrocephalus (35%), Agenesis of the corpus callosum (20%), malformation of Arnold Chiari (15%), microcephaly (15%), Craniostenosis (5%). 95% of the patients were operated. Immediate evolution was favorable in 35% of cases. Postoperative complications were mainly meningitis (10%), surgical scar infection (5%) and hydrocephalus (25%). The long-term trend was favorable in 30% of cases. Only 20% of cases had neurological sequelae (epilepsy, psychomotor retardation). Mortality at 3 months was close to 0%. Seize of the malformation and presence of associated malformations were found to correlate with the prognosis.

Conclusion: Occipital encephalocele is rare. Prognostic factors are represented essentially by the size of the herniated cerebral parenchyma and the existence of associated malformations.

Keywords: Occipital encephalocele, Surgery, Prognosis

EP-0183 [Pediatric Neurosurgery » Congenital Malformations]

A Very Rare Entity of Diabetes Insipidus Associated with Holoprosencephaly

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Edwards syndrome is the second most commonly seen trisomy. It was first described by John Hamilton Edwards in 1960. Although most cases result in termination or foetal loss, live births have been documented in 5%. Edwards syndrome is characterized by multisystem anomalies, of which (HPE) is observed in 4–8% of cases. A 35-week-old baby boy born to a 22-year-old healthy mother as a second child was spontaneously delivered vaginally. His birth weight was 1850 g (3–10 percentile), height was 42 cm (3–10 percentile) and his head circumference was 27 cm (<3 percentile). On postnatal day 5 his laboratory findings were as follows: a serum sodium (Na) of 167 mEq/l, serum and urine osmolality of 345 and 158 mOsm/kg, respectively, a urine density of 1006, urinary sodium excretion of 80 mmol/l, serum antidiuretic hormone (ADH) level of 0.9 pmol/l (normal reference range; 2–8 pmol/l) and polyuria (5.5 cc/kg/h). His genetic analysis result was 47, XY+18 inv. The clinical findings correspond to the degree of HPE malformation. Convulsions and endocrinopathies are among the severe clinical findings. The most common endocrinopathies are central diabetes insipidus (DI), hypothyroidism, hypocortisolism and growth hormone deficiency. The coexistence of holoprosencephaly and DI in Edwards syndrome was discussed under the light of literature.

Keywords: Holoprosencephaly, Diabetes Insipidus, Newborn

EP-0184 [Pediatric Neurosurgery » Vascular Disorders]

Surgical Management of Dynamic Compression in Vertebral Arterial Dissection in the Pediatric Population

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Background: Rotational occlusion of the vertebral artery (VA), also known as Bow-Hunter's Syndrome (BHS), is a rare cause of VA dissection and posterior circulation symptomatic ischemia. It most often involves the V3 segment where C1 rotates on C2. There is no consensus on the management of BHS in pediatric population. Cervical collar and anticoagulation comprise the conservative methods but they are impractical for longer periods in this age group. Either decompression or C1-C2 fixation are treatment options to prevent further ischemic attacks.

Method: Between January 2014 and December 2016, 7 consecutive male patients (mean 65.1 months) were diagnosed with rotational occlusion of the vertebral artery through bilateral dynamic angiogram. One patient underwent an anterior bony decompression at C2 as the first stage and, because of recurrent dissection, and then underwent a C1-C2 fusion. All other 6 patients underwent C1-C2 fusions (lateral mass screws in C1, pedicle screws in C2) only. Rib graft was used in all cases to promote fusion.

Results: There were no vascular or neurological complications. Mean hospitalization was 5.4 days. Only one patient needed ICU stay for just one day. We obtained excellent screw positioning and sagittal alignment in all cases. Mean follow-up period was 6 months.

Conclusion: Rotational occlusion of VA is a rare cause of vertebral artery dissection and stroke in children, but it should nevertheless be investigated with dynamic angiogram. Treatment with posterior C1-C2 fusion seems to be safe and effective in preventing further dissections and ischemia.

Keywords: Angiography, Pediatrics, Rotation, Stroke, Vertebral artery dissection, C1-C2 fusion

EP-0185 [Pediatric Neurosurgery » Vascular Disorders]

A Case Report of Complication of Endovascular Treatment of Pediatric Intracranial Dural Arteriovenous Fistula: Dissemination of Liquid Embolic Agent into Bilateral Cerebral Hemisphere

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Dural arteriovenous fistula (DAVF) represents 10-15% of all intracranial vascular malformation and most commonly seen in adults. Congenital DAVF are rare and attributed to abnormal development of the cranial dural venous sinuses. Here we report a 2-year-old child with congenital left posterior fossa AVF supplied by ECA. She underwent two stages of embolization in December 2016 and February 2017 respectively. During the second stage of embolization, there was a complication of shunting of tissue glue into left cerebral via the branches of left middle meningeal artery. Immediate CT brain revealed disseminated hyperdense lesions over bilateral cerebral hemisphere, mainly MCA territory and predominantly on the left. Chest X-ray showed scattered hyperdense lesions in lungs. Child was put on cerebral resuscitation and subsequently had emergency left decompressive craniectomy in view of elevated ICP and left MCA infarct. She improved gradually and neurology deficit of right lower limb weakness.

Keywords: Dural AVE, DAVF, Embolization

EP-0186 [Pediatric Neurosurgery » Vascular Disorders]

Giant Cavernous Malformations in Childhood: A Case Report and Review of the Literature

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Cavernous malformations (CMs) of the central nervous system are benign, angiographically occult vascular lesions and are diagnosed by magnetic resonance imaging techniques. Giant CMs do not differ from smaller-sized CMs in their clinical, surgical or histopathological presentation but may be radiologically different. A 10-year-old boy was admitted to our emergency service due to complaints of rapid depression in his level of consciousness. A cranial computed tomography scan revealed a heterogeneous lesion, causing midline shift and compression on the left lateral ventricle. There were hyperdense areas of patchy calcifications at the peripheral side of the cyst and acute hemorrhage. MRI demonstrated a mass of 8 × 7.5 × 7 cm, a multicystic, heterogeneous lesion without significant contrast enhancement causing a midline shift and compression on the left lateral ventricle. There was no peripheral hemosiderin rim. The patient was submitted to urgent surgery. The mass appeared brownish and had multiple cysts (caverns). Each cyst had brownish liquefied blood products. The cysts were coagulated, and the contents were removed by suction. The lesion could be totally removed. After the operation, the patient made a fast recovery without any neurologic deficits. We define a giant cavernoma as a cavernoma with a diameter > 6 cm, and based on this definition, we found that only 10 pediatric cases have been reported in the literature. This case provides important points for practicing neurosurgeons to consider when making a differential diagnosis of large intracranial mass lesions in pediatric patients.

Keywords: Giant cavernous malformation, Cavernous angioma, Pediatric patients

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A Rare Case of Isolated Infantile Hemangioma of The Brain – A Case Report and Review of Literature

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Infantile hemangioma is the most commonly encountered benign vascular tumor of childhood. About 83% of these lesions affect the head and neck areas. Intracranial involvement is extremely rare especially when it is isolated from other organ involvement, with only scattered reports in literature. Most of documented cases were located in the Cerebellopontine angle, with fewer reports describing other intracranial locations. Different modalities were used to treat intracranial infantile hemangiomas, though literature is lacking solid information on standard treatment. We present a case of 4 weeks old male infant with history of vomiting and increase in head circumference since birth. MRI of the brain revealed a large complex cyst occupying the right frontoparietal region, with round soft tissue component that is isointense on T1 and hyperintense on T2 weighted images. Complete surgical resection with evacuation of the cyst was achieved. Histopathology of the mass showed infantile hemangioma with positive CD31 on immunohistochemistry. Alongside, we provide review of recent literature including common locations, clinical associations, pathology and recent modalities in managing such cases. Infantile hemangioma is a benign disease entity that is separate from cavernous hemangioma and hemangioblastoma, and it should be considered in the differential diagnosis of patients coming with intracranial lesion during infancy. Our report represent a very rare case of infantile hemangioma which presented in a rare location. We did an extensive literature review to review previously reported cases and update the current knowledge regarding recent modalities of management.

Keywords: Infantile hemangioma, Vascular malformation, Intracranial, capillary hemangioma, Pediatric brain tumor

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Diagnostic Features of Intracranial Hemorrhage in Late Hemorrhagic Disease of the Newborn

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Background: Late hemorrhagic disease of the newborn (HDN) is a bleeding disorder in babies. The rate of late HDN ranges from 4.4 to 72 cases per 100,000 births. It may be associated with serious and life-threatening intracranial hemorrhage (ICH). The disease is caused by vitamin K deficiency. Purpose of the study is improving of diagnostics of intracranial hemorrhage in late hemorrhagic disease of the newborn.

Method: We observed 19 children with intracranial hemorrhage caused by late HDN. The age of patients ranged from 1 to 3 months.

For the detection, localization and volume of ICH was used cranial ultrasonography and computerized tomography of the brain. Laboratory investigations included: blood examination, clotting function.

Results: The clinical manifestations revealed of irritability, fever, excessive crying, diarrhea, intensive vomiting, jaundice. The neurological features were presented impaired of level of consciousness (84.2%), convulsions (pallor and partial seizure) (47.4%), bulging anterior fontanel (89.5%), axial hypertonus (26.3%), exotropia (21.1%), isochoric pupils (15.8%). The cerebral ultrasound and computerized tomography scan showed subdural, intraventricular, and intraparenchymal hemorrhage. Blood examination showed anemia (hemoglobin 4.6-7.6 g per 100 ml, hematocrit 23.8-28.1%), normal platelet count (474000 per mmc) and fibrinogen levels (222-288 mg per 100 ml). Clotting function was abnormal (prothrombin time (PT) 24-28%, activated partial thromboplastin time (aPTT) 44-47 s.

Conclusion: Symptoms of acute intracranial hypertension, neurological features and progressive anemia in children aged 1 to 3 months may indicate the presence of intracranial hemorrhage, as a manifestation of late hemorrhagic disease of the newborn.

Keywords: Late, Hemorrhagic, Disease, Intracranial, Hemorrhage

EP-0189 [Pediatric Neurosurgery » Vascular Disorders]

Surgical Removal of the Vein of Galen Aneurysmal Malformation: Case Report and a Brief Review of Literature

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Vein of Galen Aneurysm Malformation (VGAM) is rare congenital neurovascular disorder, where the first treatment of choice is embolization. But when embolization is not available or embolization is failed, surgical treatment becomes an optional treatment. Here we report a successful surgical resection of VGAM of five-month old girl with good outcome. A five-month old girl presented with a history of progressive head enlargement for four months. The computed tomography angiography (CTA) and venography (CTV) scan demonstrated vein of Galen aneurysm occupied pineal region compressing Sylvian aqueduct with feeder arteries two branches of the right posterior cerebral arteries (PCA), flowing into an enlarged galenic sac and enlarged straight sinus and torcular herophili. Since there're difficulties to perform embolization for such a young patient for us, surgical excision of the aneurysm was preferred. The patient developed hygroma which was shunted three months postoperatively and after that she had no main neurologic deficits within a follow-up of two years. Microsurgery is an alternative treatment for vein of Galen aneurysm malformation when embolization is not practical and it's an economic bargain. When carefully choose, patients meet the requirements, surgery maybe be a good option for VGAM. The indications favoring microsurgery are: 1) clear and limited number of feeder arteries; 2) no normal vein drained into VGAM with normal bypass set up. VP shunting in proper time is important to prevent the damage to the nervous system development.

Keywords: Vein of Galen Aneurysm Malformation (VGAM), Embolization, Hygroma

EP-0190 [Pediatric Neurosurgery » Vascular Disorders]

Carotico-Cavernous Fistula Following a Penetrating Eye Injury with a Rod: Etiopathogenesis and Management

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The carotico-cavernous fistula (CCF) is an abnormal arteriovenous shunt between the carotid system and the cavernous sinus. Penetrating traumatism is an unusual etiology. We report a unique case of a fistula following penetrating ocular trauma and discuss the etiopathogeny and management. We present the case of an 11 years old patient with a right eye penetrating injury with a rod. After initial management in the emergencies (removal of the rod and scleral wound suture), the patient was discharged but presented a month later with a pulsating exophthalmia, conjunctival redness, abducens palsy and a thrill of the right eye. Neuroradiologic investigations showed a direct right FCC. The patient underwent embolization with good recovery and regression of symptomatology. CCFs are classified according to etiopathogeny, hemodynamics or angiography. Post-traumatic CCFs are the most frequent and complicate 4% of craniofacial trauma with skull base fracture. Pediatric CCFs are unusual, accounting for only 4.6% of the total reported. Etiology is mainly motor vehicle accidents with head trauma; penetrating orbital wounds have only been reported in fifteen cases. Symptoms are essentially a pulsatile exophthalmia with a thrill, chemosis, conjunctival redness with dilated episcleral veins. Cerebral MRI and angiography allow for the diagnosis and classification. Post-traumatic CCFs should always be treated (embolization). If overlooked it can have dramatic consequences like epistaxis or intracerebral haemorrhage. CCFs remain an uncommon disease mainly due to significant craniofacial trauma. Penetrating injuries should also be considered as a possible etiology and patients should undergo careful screening.

Keywords: Carotico-cavernous fistula, Penetrating injury, Embolization

EP-0191 [Pediatric Neurosurgery » Vascular Disorders]

Epidemiological Profile of Spontaneous Hemorrhagic Stroke in Pediatric Population

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Background: Spontaneous hemorrhagic stroke in children is a serious illness, with an unfavorable outcome of incapacity or death. The incidence is 1.1 per 100,000 / year and its main etiologies are arteriovenous malformations (AVMs). Our aim is to analyze

the prevalence of the clinical characteristics and main causes of spontaneous stroke in the pediatric age group in a tertiary hospital. **Method:** Retrospective, descriptive study with data from 33 medical records of patients up to 18 years of age admitted to a tertiary hospital with diagnosis of non-traumatic stroke. The data were collected in a standard form, organized into spreadsheets.

Results: Vascular diseases represented the largest number: 51.51%; Followed by hematological diseases (24.24%); Infectious (15.15%), drug related (3.03%) and idiopathic (3.03%). AVMs accounted for 60% of vascular affections, while cerebral aneurysms and systemic arterial hypertension, 29% and 11%, respectively. Hematologic diseases were disorders of coagulation, leukemia and sickle cell anemia. The drug causes, 66.67% were by chemotherapeutic and 33.33%, anticoagulants. All patients had headache, 51.51% had seizures, 45.45% had focal deficits and 39.39% had altered levels of consciousness. Emergency surgical treatment was instituted in 54.54%, but 42.42% died.

Conclusion: The clinical signs and etiology of stroke in the pediatric population differ from adults. Mortality rates are also high, despite advances in diagnostic methods and neurosurgical techniques. In the pediatric age group, AVM and hematological dysfunctions due to coagulation disorders are highlighted as the main causes of hemorrhagic stroke.

Keywords: Pediatric stroke, Pediatrics, Arteriovenous malformations

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Hemangioma of the Facial Nerve Canal: Clinical and Imaging Findings of a Rare Vascular Lesion

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Hemangioma originating in the facial nerve canal is very rare. Patients usually presented with tinnitus, facial nerve paresis and hearing loss and the symptoms usually appear when the tumor is small. We aim to share clinical and imaging findings of a large facial nerve canal hemangioma. Computed tomography (CT), magnetic resonance imaging (MRI), preoperative digital subtraction angiography (DSA), intraoperative and histopathological findings were presented. A 15-year-old male presented with left facial weakness and headache. On examination, the patient was intact except for facial paresis (HouseBrackmann Grade 4-5). The patient also had progressive sensorineural hearing loss that became worse for last 2-3 years. On CT, an expansile lytic lesion involving the left geniculate ganglion, labyrinthine and tympanic segments with intralesional osseous matrix was found. T2-weighted images demonstrated a large hyperintense lesion in the left geniculate ganglion. The lesion showed marked enhancement. Because of the arterial phase blood flow demonstrated on CT angiography, coil embolization was performed the day before surgery. The patient underwent a combined transmastoid and middle fossa craniotomy.

Surgical pathology was compatible with hemangioma. The patient recovered to grade 3 facial paresis just after surgery and had grade 4 in the first month follow-up examination. Although rare, hemangioma of the facial nerve canal should be considered in the presence of facial paresis in pediatric patients. Symptoms usually appear when the tumor is small but as in our patient, accompanying sensorineural hearing loss may delay the diagnosis. Vascular imaging and preoperative embolization should be considered to reduce intraoperative bleeding.

Keywords: Facial nerve canal, Hemangioma, CT, MRI, Angiography, Embolisation

EP-0193 [Pediatric Neurosurgery » Vascular Disorders]

Management of Elevated Intracranial Pressure (ICP) with Pentobarbital-Induced Coma in Patients with Acute Intracerebral Hematoma (ICH) due to Ruptured Arteriovenous Malformations (AVM)

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Background: Pediatric ICHs caused by AVMs are often acute, life threatening events requiring prompt attention. Surgical evacuation in the acute period may be life-saving but may cause further damage the edematous brain or incite bleeding from a poorly defined AVM. Pentobarbital induced coma is a well-known and effective way of treating elevated ICP in patients with head trauma, however it has not been described in pediatric AVM patients presenting with acute ICH. We report a series of pediatric patients with ruptured AVMs in whom pentobarbital coma was used to control refractory intracranial hypertension with minimal neurological sequel. We reviewed 116 pediatric patients with ruptured AVM in our registry. Pentobarbital was utilized in 24 patients for control of ICP refractory to medical management.

Method: In 20 patients (13M,7F; mean ages 11.4y) pentobarbital infusion succeeded in controlling ICP, and in 4 patients, pentobarbital treatment was unsuccessful (2 died, 2 needed surgical decompression). Mean hematoma volume was 30.3 ml. Mean pentobarbital infusion time, ICU duration, and hospital stay was 7, 22.3, and 29.1 days, respectively. Complications observed during their ICU stay included were pneumonia, sepsis, urinary tract infections, pancreatitis. These patients will be compared to patients who underwent hematoma evacuation and patients medically managed without pentobarbital infusion.

Results: All patients subsequently underwent definitive treatment (surgery, radiosurgery, endovascular or combined).

Conclusion: Pentobarbital induced coma is an effective and safe method for controlling the pertinacious elevated ICPs in pediatric patients presented with ICH due to ruptured AVMs.

Keywords: Pediatric intracerebral hematoma, Arteriovenous malformation, Elevated intracranial pressure, Pentobarbital induced coma

EP-0194 [Pediatric Neurosurgery » Pediatric Oncology]**Pediatric Rhabdoid Meningioma: Clinical and Therapeutic Features Findings in 3 Patients**

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Pediatric Rhabdoid Meningioma (RM) are the rarest, but most aggressive subtype of meningioma, with indeterminate but severe prognosis. They account for 1-3% of all intracranial meningioma. We discuss the clinical, histological and therapeutic features of this rare tumour. Three children were managed and treated for a RM in two neurosurgical in Tunis. Clinical and therapeutic data were studied retrospectively. There were 2 females (3 years old and 1 year and 6 months old) and one male (16 years old). The revealing symptoms in patients (first and the third cases) were the signs of intracranial hypertension. In the second case the signs were a progressive development over 2 months of a left occipital tumefaction with no neurological signs. Cranial MRI showed an extra-axial tumor of the right Ponto-cerebellar angle (first case), a left occipital tumor with attachment to the temporal bone and extracranial extension (second case), and a left extra-axial parietal tumor for the third case. All patient underwent a surgical intervention with a gross total resection. Histological evaluation supported by immunohistochemistry confirmed the diagnosis of RM. Tumor recurrence was observed at 45 days in the first case with a fatal outcome. Both second and third cases underwent an adjuvant radiotherapy. Local recurrence was also diagnosed in the 2 other patients with a second surgery needed, 1 month after radiotherapy. RM are very aggressive tumours. A clear guide line is still a debate and most study shows that surgical treatment is insufficient.

Keywords: Rhabdoid meningioma, Pediatric, Surgery

EP-0195 [Pediatric Neurosurgery » Pediatric Oncology]**Age-Related Outcomes of Treatment of Medulloblastoma in Children**

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Background: Medulloblastoma is the common malignant tumor of childhood with a tendency to metastasize via CSF pathway.

Method: In current study the analysis of treatment of 297 children with medulloblastoma in 1991-2014 years was performed. Males/females – 2:1. The median age was 7.6±2.1. The 11,1% patients were of 0-3 years of old, 32.6%–3-7, 38.4%–7-11; 11,1% – 12-18. The stage of T1M0-T2M0 was in 28,8% children, T3aM0-T3bM0 in 68% children, T4M0 in 7% children. M1-M3 stage was in 17,4%. M4 was not identify. Localization of tumor in 247 (83,1%) children was vermis of cerebellum/IV ventricle, vermis/hemisphere of

cerebellum in 34(11.4%), hemisphere at 16(5.4%). The involving of brainstem was in 77(25,9%), pontocerebellar angle in 4(1.3%). A complete resection was in 113(40.6%), subtotal in 149(53,6%), partial in 16(5.8%), shunt operation in 71(25,5%). Postoperative mortality was 10,4%. Complete adjuvant treatment passed 65% children, partly – 31%, 4% did not get. The median follow-up was 27±3,1 months.

Results: In 42.4% children < 3 year was classic medulloblastoma and anaplastic type in 27.3%, in older children classic type was in 63-85%. Median of progression-free survival in children < 3 year with M0 was 18 months, with M1-M2 - 12 months, in older children -24 months. The 5 year overall survival in children < 3 years was 37.8%, in older children of high-risk group 58%.

Conclusion: The involving of brainstem and pontocerebellar angle is rare in children < 3 years with medulloblastoma. The subtotal resection in young children connected with the better quality of life.

Keywords: Medulloblastoma, Children, Surgical treatment, Survival, Age-related outcomes

EP-0196 [Pediatric Neurosurgery » Pediatric Oncology]**Mature Teratoma of Petrous Temporal Bone in an Infant: A Rare Clinical Entity**

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Mature teratoma is a benign germ cell tumour comprised of cells of all three germ layers. It usually arises in the midline and may involve lateral structures rarely. We report a rare case of mature teratoma of left petrous temporal bone in a 11 month old female child presenting with retroauricular swelling. Patient was operated upon and diagnosis was confirmed after histopathology.

Keywords: Mature teratoma, Germ cell tumor, Intracranial

EP-0197 [Pediatric Neurosurgery » Pediatric Oncology]**The Case of Successful Surgical Treatment of a Giant Cerebral Teratoma: A Literature Review and an Observation from the Medical Practice**

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Teratoma is a congenital tumor that can be a tissue or even an organ, which is atypical for the tumor localization. These tumors require a particular kind of clinical treatment. Surgery is the 'golden' standard in the treatment of this type of tumor. This article demonstrates the technical possibility of total removal of the giant teratoma from the brain of the 25-days-old baby. According to the clinical, neurological and instrumental investigations, the positive dynamics was observed during the postoperative period.

Keywords: Teratoma, Congenital brain tumors, Surgery

EP-0198 [Pediatric Neurosurgery » Pediatric Oncology] Posterior Fossa Syndrome: Can We Identify Risk Factors?

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Background: Posterior fossa syndrome (PFS) is a severe postoperative complication affecting children operated for posterior fossa tumors. It includes different symptoms: mutism or speech disturbances, decreased motor movements, dysphagia, cranial nerve palsies and emotional lability.

Method: We report a retrospective study of 24 children operated for posterior fossa tumor. Preoperative and postoperative psychological and language examinations were compared. Delay between occurrence and disappearance of the PFS was calculated. Finally potential risk factors such: age, location and size of the tumor, hydrocephalus, operative approach, extension of resection, histology and postoperative infection were studied.

Results: PFS occurred in 4 patients always in the early postoperative period (48 hours). Speech disturbances were present in all patients while emotional lability was observed in 2 cases. Age ranged from 20 months to 14 years. All tumors were large. Vermeectomy was done in 3 patients while one patient was approached by transcerebellar route. Histology revealed 2 medulloblastomas, 1 pilocytic astrocytoma and 1 ganglioglioma. Mutism was transient in all patients while emotional lability resolved in one patient. Analyse of potential risk factors failed to identify a significant factor of occurrence.

Conclusion: Pathogenesis of PFS remains unclear but is probably multifactorial; mechanical and thermal injuries seem to be major factors. The identification of risk factors could lead to changes in technology and surgical treatment strategies to prevent or reduce the incidence of PFS which can be a cause of permanent disability. Early recognition of PFS and then adequate management can improve outcome.

Keywords: Posterior fossa syndrome, Mutism, Risk factors

EP-0199 [Pediatric Neurosurgery » Pediatric Oncology] Cerebral Tumors in Children: About 160 Cases in E.H.S Ali Ait Idir

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The cerebral tumors in children represents 15 to 20% that occur before the age of 15 years. it represent the 2nd affection after the hematological pathology. The clinic is based on the age and location. We collected between January 2014 and June 2016 160 cases of cerebral tumors at the E.H.S Ali Ait Idir. Symptoms vary depending on size and location of tumor and the age of the patient. Prognosis is based upon many factors including the type of tumor, its location and grade, the length of time your child has exhibited symptoms, the speed of growth, and treatment options. Adjuvant therapy is a determining factor in the treatment of malignant tumors. The cerebral tumors in children is characterized by variable clinical histology. These are neurosurgical emergency requiring a multidisciplinary approach.

Keywords: Cerebral tumor, Multidisciplinary approach, Histology

EP-0200 [Pediatric Neurosurgery » Pediatric Oncology] Pediatric High Grade Gliomas

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Background: Pediatric high grade gliomas are rare with a uniformly pejorative prognosis and no codified management guidelines.

Method: Six patients treated at the neurosurgery department of Fattouma Bourguiba University Hospital within the last three years were included in the study. The histological subgroups were compared.

Results: Three males and three females, aged between 5 and 17 years with a mean age at presentation of 11 years were included. Signs of increased intracranial pressure were present in 50% of cases, a motor deficit in 33.33% of cases and a decreased visual acuity in 20% of cases. The tumor located within the parietal lobe in three cases, the frontal lobe in one case, the brainstem in one case and was confined to the third ventricle in another case. Complete surgical resection was achieved in 50% of cases. Pathological study of the surgical specimens found five cases of Glioblastoma and one case of anaplastic astrocytoma. Adjuvant chemo- radiation therapy was used with all cases. Total survival ranged from 8 to 17 months for Glioblastomas (average of 11 months) and was of three years for the anaplastic astrocytoma.

Conclusion: High grade gliomas are rare in the pediatric population. Whenever feasible, multimodal treatment including surgery plus chemo- radiation therapy is the treatment of choice. Anaplastic astrocytoma carry a better prognosis than Glioblastomas.

Keywords: Pediatric, High grade glioma, Surgery, Prognosis

EP-0201 [Pediatric Neurosurgery » Pediatric Oncology] Treatment of Central Nervous System Tumors in Children Under 3 Years of Age and Its Results

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Background: The treatment of children under 3 years of age is the difficult problem for neurosurgeons. Brain tumors in these children differ in pathological behavior from those in older patients.

Method: We reviewed data from 147 children (85 male and 62 female) under 3 years of age, who were treated for central nervous system tumors at the Institute of Neurosurgery in the period from 2010 to 2017. Localization: supratentorial tumors –66cases(45%), subtentorial tumors –73 cases (50%), extra-intracranial tumors –4 cases (2.5%), intra-extravertebral tumors –4 cases (2.5%). Histological diagnosis: astrocytomas –43 cases (29%), medulloblastomas –24cases (16%), embryonal tumors –24 cases (16%), mesenchymal tumors –3 cases (≈1.6%), choroid plexus tumors –19 cases (12.9%), ependymomas – 15cases (10.9%), pineoblastomas –4 cases (2.7%), others –15 cases (10.9%). Surgery: total removal –26 patients (17.6%), gross total removal –86 patients

(58.7%), partial removal –24 cases (16%), biopsy –7 cases (4.7%), shunting operation –4 cases (3%). 19 shunting operations were done in patients with tumor resection.

Results: As a study of 147 children under 3 years of age showed the mortality rate during hospitalization was 15.6% (23 patients). The analysis revealed following associations: supratentorial localization is predominated in the first year of age. Astrocytomas, medulloblastomas and embryonal tumors are most frequent neoplasms in children under 3 years of age (61%). Malignant tumors presented the worst outcome. Surgical removal did not correlate with histology or its location.

Conclusion: Survival has improved in a short-term perspective. Surgical radicality and qualitative adjuvant treatments are provided with long-term survival.

Keywords: Children, Tumor, Histology, Surgery

EP-0202 [Pediatric Neurosurgery » Pediatric Oncology]

Posterior Fossa Tumours in Children at Parirenyatwa Hospital, Zimbabwe

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Background: It is important to know the epidemiology of posterior fossa tumors in children. Groups at risk can then be identified and followed up with the aim of reducing late presentation and improving outcome. However larger, long term studies are needed to accurately achieve this. The aim is to describe the effect of demographics, social background and HIV on the occurrence of posterior fossa tumors.

Method: Prospective Cross sectional study of children treated for posterior fossa tumors at the Neurosurgical unit of Parirenyatwa referral hospital. The setting is Neurosurgery unit, Parirenyatwa teaching and referral hospital, Zimbabwe. A total of 32 children admitted with imaging demonstrating a posterior fossa tumor were included after the parents gave consent for their children to participate in the study. No patients were excluded from the study. All patients were tested for HIV using the antibody test. Data was collected by administering a questionnaire.

Results: Most cases came from the Eastern Manicaland province with mean age of the patients being 6.7(SD) years and age ranging from 2–12 years. Median time to presentation from symptom onset was 3.5[2 - 6] months. Most patients were of poor socio economic status. A total of 7(21.7%) were HIV positive.

Conclusion: Posterior fossa tumors at Parirenyatwa hospital occur more commonly in low income families from Manicaland. There was a higher HIV rate in the study patients compared to the national paediatric population. The sample size was however too small to demonstrate a statistically significant correlation between HIV and posterior fossae tumor occurrence.

Keywords: Posterior fossa tumour, Epidemiology, Socio-demographics, Paediatric brain tumours, HIV

EP-0203 [Pediatric Neurosurgery » Pediatric Oncology]

Primary Tumors of the Medullary Cords in Childhood: An Epidemiological Study in a Reference Neurosurgery Hospital

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Background: Primary Central Nervous System tumors are the second leading cause of childhood cancer death and occur with severe pain and potential irreversible neurological damage. Medullary tumors of childhood correspond of 1 to 3% of malignant tumors in pediatrics. Magnetic Resonance Imaging (MRI) is the gold standard examination for diagnosis. AIMS: Describe the epidemiological profile of spinal tumors in children.

Method: A retrospective cross-sectional study was accomplished with medical records of 16 patients. The sample was defined with patients below 18 years old with such tumors found by MRI and post-surgical pathology report between January 2010 and March 2016.

Results: Major prevalence in the male gender, 68.75% (11). The mean age was 9.6 years. The most affected sites were thoracic and cervical spine, both with 31.2% (5), followed by cervicothoracic junction, 18.75% (3), equine tail, 12.5% (2) and skull and cervical spine, 6.25% (1). Low-grade astrocytoma was the most frequent pathology, with 50% of cases (8), with a genres ratio of 1.7: 1 and reaching patients between 8 and 15 years. The most frequent symptom was paresis with 62.5% of cases (10) followed by pain in 50% of patients (10) and location associated with the level of spinal cord injury. Other symptoms were plegia: 18.75% (3), gait claudication; 18.75% (3), torticollis; 12.5% (2) and loss of sensitivity and respiratory failure 6.25% (1).

Conclusion: The knowledge about these is essential due to the important differential diagnosis of the children's syndromes with neurological deficits and their important morbidity.

Keywords: Primary tumors, Medullary tumors, Childhood, Epidemiology

EP-0204 [Pediatric Neurosurgery » Pediatric Oncology]

Glioblastoma Multiform in Children - Series of Cases

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Background: The incidence of primary glioblastoma multiform (GBM) in the pediatric age group is rare (0.8 per 100,000 children) and its genesis differs from the classic presentations of GBM in

adults. Our aim is to show a series of 8 cases involving children with GBM from 2010 to 2017 in a neurosurgery hospital center.

Method: Field data collection associated with literary review. They were part of the patient's analysis in the age group of 7 to 12-years-old.

Results: There was 3 male (37.5%) and 5 female (62.5%); were found 7 supratentorial lesions (87.5%), and 1 spinal cord injury. Of the supratentorial lesions, 57% were localized in a thalamus or capsular nucleus region. The spinal cord lesion was localized at cervical and the neurological exam revealed motor deficit and tetraparesis. The majority of the patients entered in the service presenting convulsion and headache (85.7%), while motor deficit and hemiparesis were found in only one patient with cortical involvement. All the patients were submitted to neurosurgical treatment to resection of the lesions. The longest time after a neurosurgical broach was 6 months, with a 4-month survival in 37.5% of the cases, 3 months in 25% and in the patient with spinal cord involvement, the postoperative survival was only 2 months.

Conclusion: The addition of adjuvant therapy with chemotherapy and, in particular, radiotherapy, is essential in survival prolonging of these patients, although the most significant studies show maximum rates around 11-15 months. We emphasize the need for multicenter studies to better understand about this disease.

Keywords: Glioblastoma multiform, Pediatric population, Neurosurgery

EP-0205 [Pediatric Neurosurgery » Pediatric Oncology]

Primary Extraosseous Ewing Sarcoma of the Thoracic Spinal Region Presenting with Acute Paraplegia in Children

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Metastases to the vertebrae are quite common, and are encountered in 70% of cancer patients. While it is possible for every region of the spinal vertebrae to be exposed to metastasis, spreading occurs most frequently in the lumbar, thoracic, and cervical regions. Ewing sarcoma is most often seen between the ages of 5 and 25. The first symptom at time of diagnosis is localized pain, and two-thirds of cases present with neurological deficit. Our case involved a 15-year-old male adolescent, who for three days had experienced rapidly advancing loss of sensation and motor strength below the T8 level. The patient had received a prediagnosis of transverse myelitis by pediatric neurologists. When a mass exerting a high degree of pressure on the spinal cord in the epidural region was observed during examination, the patient was referred to our clinic. The patient underwent emergency hemilaminotomy between T6-T9, and the soft, viscous mass, which was pressing on the epidural region of the spinal cord, was completely removed. In the early period following surgery the patient became hypesthetic in the dermatomes below T7. In the lower extremities, motor strength was reduced to 3/5 levels. The patient, who had started physical therapy in the early period, then underwent a round of pediatric oncology. Because Ewing sarcoma is quite sensitive to radiotherapy and

chemotherapy, the tumor should be completely removed as soon as possible and oncological treatment should commence. With the current multidisciplinary approach, long-term survival has gone from 5-20% to 50-80%.

Keywords: Ewing sarcoma, Extraosseöz, Paraplegia, Surgery

EP-0206 [Pediatric Neurosurgery » Pediatric Oncology]

High-Definition Fiber Tractography in Evaluation and Surgical Planning of Thalamopeduncular Pilocytic Astrocytomas in Pediatric Population: Case Series and Review of Literature

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Background: Thalamopeduncular tumors (TPTs) of the childhood present a challenge for neurosurgeons due to their eloquent location. Preoperative fiber tracking provides total or near-total resection, without additional neurological deficit. High-definition fiber tractography (HDFT) is an advanced white matter imaging technique derived from magnetic resonance imaging diffusion data, shown to overcome limitations of diffusion tensor imaging. We aimed to investigate alterations of corticospinal tract (CST) and medial lemniscus (ML) caused by TPTs and to demonstrate the application of HDFT in preoperative planning.

Method: Three pediatric patients with TPTs were enrolled. CSTs and MLs were evaluated for displacement, infiltration, disruption. Relationship of these tracts to tumors were identified and guided surgical planning. Literature was reviewed for publications on pediatric thalamic and TPTs, that utilized diffusion imaging.

Results: Two patients had histological diagnosis of pilocytic astrocytoma. One patient was managed conservatively, whose imaging suggested a low-grade glioma. All tracts were displaced (one CST anteriorly, two CST and one ML anteromedially, one ML medially, one ML posteromedially). Literature review revealed two publications with 15 pilocytic astrocytoma cases, which investigated CST only. Condition of sensory pathway or anteromedial displacement of the CST in these tumors was not reported previously.

Conclusion: Displacement patterns of the perilesional fiber bundles by TPTs are not predictable. Fiber tracking, preferably HDFT, should be a part of the preoperative planning in order to achieve maximal extent of resection for longer survival rates in this young group of patients, while preserving white matter tracts, thus, quality of life.

Keywords: Diffusion tensor imaging, High-definition fiber tractography, Pediatric, Pilocytic astrocytoma, Thalamopeduncular

EP-0207 [Pediatric Neurosurgery » Pediatric Oncology] Extracranial Metastasis of an Anaplastic Ependymoma: A Rare Occurrence

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Primary intracranial ependymomas originate from ependymal cells. They may migrate mainly in the spinal cord but rarely metastasize outside the central nervous system. We report the case of a 16-year-old female, who underwent in 2012 complete surgical removal of a left occipital 2007 WHO grade II ependymoma. In 2016 the patient presented multiple cervical and occipital indurated masses. MRI showed a left hemispheric meningeal infiltration, with a multiple nodules located on the neck, occiput and mastoid. Histopathological study of a left temporal surgical biopsy and resection of an occipital subcutaneous nodule turned to be metastases of an anaplastic ependymoma. Metastases outside the central nervous system are rare. Metastatic diffusion from the central nervous system is low due to the unique interaction of the brain and the tumor with the blood-brain barrier. Nevertheless, three main hypotheses have been mentioned in the literature, the tumor growth, the surgical manipulation (which may be considered to be the case in our patient), and the aggressiveness of the tumor according to the Ki67 index. The ependymoma considered as a benign tumor could very quickly turn into malignancy by its metastatic potential. Early diagnosis and longer follow-up of patients would be recommended for a rapid management.

Keywords: Anaplastic ependymoma, Extracranial, Metastasis, Extraneural

EP-0208 [Pediatric Neurosurgery » Pediatric Oncology] Determination of the Central Nervous System Tumors' Profiles in Pediatric Population

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Background: Tumors of the CNS are the leading cause of cancer deaths in children and are the second most prevalent tumors in this age group, comprising more than 20% of all tumors. Our aim is to characterize the profile of tumors of the CNS according to their location, first lesions and histological type in the pediatric population attended at a referral hospital.

Method: It is a retrospective and descriptive study to survey all new cases of brain tumors in children with a mean age of 9 years, admitted to a referral hospital. It was conducted from January 2010 to December 2015. Data were collected from the medical records and analyzed through Microsoft Excel 2007.

Results: The most prevalent tumor was pilocytic astrocytoma, followed by medulloblastoma. Most prevalent location, including primary brain tumors, CNS tumors and metastases was supratentorial with 32 cases, then the infratentorial with 20 and finally with spinal cord with 12 cases. Metastatic tumors reached 6.3% (n = 4) and the primary sites corresponded to kidney, osteosarcoma, melanoma and leukemia. Primary tumors accounted for 93.7% of cases (n = 60), and were confirmed by 16 different histological types by anatomopathology. Of these, there was a predominance of pilocytic astrocytoma, medulloblastomas, Ependymomas, Glioblastoma, among others.

Conclusion: Data analysis allowed the identification of a significant incidence of supratentorial tumors, although the literature points to posterior fossa tumors as more prevalent. The study of CNS neoplasms in children have great importance and its early diagnosis is necessary to reduce morbidity and mortality.

Keywords: Central nervous system's tumors, Pediatric population, Pilocytic astrocytoma, Medulloblastoma

EP-0209 [Pediatric Neurosurgery » Pediatric Oncology] Extracranial Dissemination of Glioblastoma Multiforme in a Peruvian Child. Case Report

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Glioblastoma is the most common and aggressive malignant brain tumor in adults, accounting 60-70% of gliomas. The incidence of Glioblastoma Multiforme in pediatric population is lower than adults and the prognosis is poor despite of current standard therapy. A 10 year-old boy was admitted to the emergency room from the National Institute for Children-San Borja (Lima-Peru) with headache, vomiting and pupil dilatation. Head MRI showed an intraventricular tumor with associated hydrocephalus. Glioblastoma Multiforme was diagnosed after radical surgical resection. One month later, patient developed ascites and pleural effusion. CT scan revealed peritoneal implants and a pulmonary nodule. It is the first report of extracranial dissemination of Glioblastoma Multiforme in a peruvian child.

Keywords: Glioblastoma multiforme, Extracranial dissemination, Children

EP-0210 [Pediatric Neurosurgery » Pediatric Oncology] Cerebellum Pilomyxoid Astrocytoma: A Study of 4 Cases

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Background: Pilomyxoid astrocytoma (PMA) is a recently recognised World Health Organization (WHO) Grade II tumor distinct from pilocytic astrocytomas (PA). They may be more aggressive with a different clinical course compared to PA due

to its greater propensity for local recurrence and cerebrospinal dissemination. Most cases arise from the hypothalamic/chiasmatic region. Few studies reported cerebellum localization of the lesion. The authors present 4 cases of pediatric cerebellum PMA and discuss the clinical, radiological features and postoperative course of this tumor.

Method: This is a retrospective study including 4 children (2 males and 2 females) with cerebellar PMA treated between January 2006 to November 2016 at National Institute Mongi Ben Hmida of Neurology and Burns and Trauma Center neurosurgical departments. Clinical, radiological, and prognostic features were reviewed. The follow-up was 1 to 5 years.

Results: Patient's age was between 1 and 11 years old. Signs of intracranial hypertension were found in all patients. One of them presented an increased head circumference and the 3 others had a cerebellar syndrome. Brain CT-scan and MRI displayed a large well-circumscribed intra-axial solid and cystic posterior fossa tumor. Total surgical resection was performed for all tumors. At one year of follow-up, a local recurrence was diagnosed in one of the children requiring adjuvant treatment.

Conclusion: PMA of the cerebellum are rare. Clinical and radiological follow up are mandatory do to different natural history and higher rates of local recurrence of this tumor compared to PA.

Keywords: Pilomyxoid astrocytoma, Cerebellum, Surgery, Child

EP-0211 [Pediatric Neurosurgery » CSF Disorders]

Microscopic Removal of Deep Seated Retained Ventricular Catheter in a Child with Recurrent VP Shunt Infection

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We present a case of one year-old child who had VP shunt inserted soon after birth for congenital hydrocephalus. The child had several shunt revision (3 in total) for obstructions and infections performed in another hospital. All infections were caused by one bacterium (Staph. Epidermis). She was admitted to our hospital with fever, vomiting, and drowsiness. CT head showed multi-loculated hydrocephalus. 2 ventricular catheters were found on belong to her right frontal VP shunt and one isolated and located deep in the brain parenchyma between the right sylvian fissure and the right thalamus. The reservoir was tap and showed CSF infection with the same bacteria. She had first an emergency surgery for removal of her shunt and insertion of EVD, then we decided to remove her deep seated ventricular catheter to prevent further recurrence of her infection. The second surgery was performed microscopically with navigation (Stealth) one week after her first one. After the clearance of her CSF infection a new right frontal VP shunt was inserted. During her 18 months follow up she had no more shunt infection or obstruction. This case emphasizes the need for removal of all retained shunt catheters to prevent recurrent shunt infections. In cases where catheters are outside the ventricles or endoscopy is not feasible; microscopical removal with navigation should be attempted for deep seated tubes.

Keywords: VP shunt infection, Retained ventricular catheters, Staph epidermis

EP-0212 [Pediatric Neurosurgery » CSF Disorders]

Factors Predicting Outcomes After Surgery in Post-Meningitic Hydrocephalus

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Post meningitic hydrocephalus is a common and perplexing disease of the developing world. It is almost always seen in patients with meningitis for 4 weeks. Meningitis maybe pyogenic, tubercular (which is very common), viral and rarely fungal or parasitic. The most definitive treatment for hydrocephalus, is surgical however active or severe the meningitic process maybe. Surgical options are various forms of shunting into the myriad body cavities, of which ventriculo peritoneal shunt is the most common, feasible and proven surgery. The high incidence of post meningitic hydrocephalus, their varied presentations, the different specialities handling these cases before referral, and its sequelae necessitates a study on prognostication which will help in triage, prompt management and referral and the counselling of the relatives, hence the need of this study which is an attempt to analyze the factors predicting outcome after surgery.

Keywords: Postmeningitic, Hydrocephalus, Prognostication

EP-0213 [Pediatric Neurosurgery » CSF Disorders]

Shunt Tube Calcification as a Late Complication of Ventriculoperitoneal Shunting

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Shunt calcification is a rare complication of ventriculoperitoneal shunting that occurs years later after the initial operation this condition is rarely reported in literature. Two patients with shunt calcifications were described. The first patient was 17yearold lady who had congenital hydrocephalus and shunted in the early infancy, she was presented recently complaining of itching of the skin along the shunt track and limitation of neck movement. The patient was then operated with removal of the old peritoneal catheter and replacing it with a new one. The second patient was 17yearold boy originally was a case of posterior fossa pilocytic astrocytoma associated with obstructive hydrocephalus, he was operated with both shunting for the hydrocephalus and tumor removal, 6 years later he presented with shunt exposure. Calcification of the shunt tube was discovered intraoperatively upon shunt removal. Shunt calcification has been observed mainly in bariumimpregnated catheters. Introducing plain siliconcoated shunt tubing may reduce the rate of this condition. The usual complaints of the patients suffering from this condition are pain in the neck and chest wall along the shunt pathway and limitation of the neck movement due to shunt tube tethering, but features of shunt dysfunction and skin irritation above the shunt may be present. In this review, plain Xray and operative findings showed that the most extensive calcification is present in the neck, where the catheters were subject to heavy mechanical stress. Disturbed calcium and phosphate metabolisms may be involved in this condition.

Keywords: Bariumimpregnated catheters, Calcification, Shunt complications

EP-0214 [Pediatric Neurosurgery » CSF Disorders]**Bilateral Higroma After Early Ventricle Peritoneal Shunt Placed in Children with Previous Third Ventriculostomy Hemorrhage Procedure**

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We report a case of five year old female children with history of recurrent seizures and psicomotor deficiency due triventricular hydrocephalus in relation with acueductal stenosis. It was performed pre mamillary traditional endoscopic fenestration occurring nearly the place an acute intraventricular hemorrhage cause choroidal plexus mechanical injury during the finishing procedure. Several endoscopic fisiological solution irrigation was performed to get hemostasis of the complication. Control CT Scan showed local righth monro and third ventricle recess organized haematoma obstruction, with patient presenting immediately hours after surgery sugesting signs of intracranial hypertension like vomiting, headache, weekness and blood hypertension. And early occipital medium pressure Ventricle peritoneal shunt after the surgery solved the clinical intercurrence. Many days CT scan image control shows no haematoma and development of bilateral higromas secondary the ventricle peritoneal procedure due overdrainage and sugesting function of the previous Ventriculostomy. Patient become to present ataxia and seizures, reason to we decide ligate the shunt distal cateter and see the clinical evolución who was successfully at the present time.

Keywords: Third ventriculostomy, Hemorrhage, Ventricle peritoneal shunt, Bilateral higroma

EP-0215 [Pediatric Neurosurgery » CSF Disorders]**Hydrocephalus in Sudan; Types, Management and Outcome**

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Background: The incidence of congenital hydrocephalus is still very high in Sudan. Most of the patients present late with large head and malnutrition which make the management very difficult.

Method: This study is a retrospective review joining all children younger than 15 years of age who have been operated at the National Center for Neurological Sciences during the period from Aug 2011 to December 2013. The data obtained from a computerized data record system in the center and the patients were clinically assessed by the author when during follow up in the refer clinic.

Results: Most patients lie in the age group (birth – 3 months) 40.5%. The majority of the cases presented with large head 71.8%. Hydrocephalus secondary to Chiari II malformation represented the commonest etiology of congenital hydrocephalus (42.7%) while postmeningitic hydrocephalus was the commonest etiology of secondary hydrocephalus (82.1%). Folic acid and supplements were defective in 72.5% of the pregnant ladies.

Conclusion: Early detection and management of hydrocephalus

should be considered by increasing the awareness of the medical professionals and the general populations. The use of strict meticulous aseptic technique during the operative procedure is crucial in preventing shunt infection and most other serious complications. The ventriculoperitoneal shunt procedure is not an easy one and should be performed by the most experienced neurosurgeon.

Keywords: Congenital hydrocephalus, Large head, Folic acid deficiency

EP-0216 [Pediatric Neurosurgery » CSF Disorders]**Initial Experience with Silver-Implanted Polyurethane Ventricular Catheter for Shunting of Cerebrospinal Fluid in Patients with Infected Hydrocephalus**

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Background: Infection is a major complication and risk factor of cerebrospinal fluid (CSF) shunting procedures. Recently antibiotic-impregnated shunt systems have been developed in an attempt to prevent or reduce the CSF infection. The aim of this presentation is to determine the efficacy of silver-impregnated polyurethane ventricular catheter for shunting of CSF in patients with infected hydrocephalus.

Method: Seven patients who had hydrocephalus with high protein level and positive CSF culture underwent implantation of ventriculoperitoneal shunt with silver-impregnated polyurethane ventricular catheter. Five of them experienced shunt failure previously. The Silverline ventricular catheter attached to the Miethke gav valve system and peritoneal catheter was used in all patients. The mean follow-up period after operation was four months. CSF samples from the reservoir of the shunts were obtained at the end of third month after operation in all patients.

Results: The protein levels of the patients were reduced significantly and the CSF culture became negative after shunt placement with silver-impregnated polyurethane ventricular catheters. No shunt obstruction nor infection was observed in the follow-up period.

Conclusion: Silver-impregnated polyurethane ventricular catheters appear to be safe and well tolerated in patients who had high protein level and positive CSF culture. Preliminary results suggest a complete improvement of infection. Longer follow-up and large number of patients are needed to more accurately assess the efficacy of these catheters.

Keywords: Hydrocephalus, Silver, Catheter

EP-0217 [Pediatric Neurosurgery » CSF Disorders]**Misdiagnosis of a Case with Overshunting Associated Cervical Myelopathy**

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We report an unusual case of engorged epidural veins causing progressive cervical myelopathy after longterm cerebrospinal fluid

(CSF) shunt therapy and intracranial hypotension. An 12-year-old boy, who had previously undergone 2 shunts placement (lateral ventricle and 4th ventricle) for a post-infection hydrocephalus during his infancy, presented with progressive slit-ventricle syndrome. Spastic quadripareisis, numbness, and gait difficulty happened at 10 y/o. Neuroimaging disclosed markedly engorged anterior epidural veins causing compression of the cervical spinal cord. Posterior decompression surgery from C0-C5 was performed and his symptoms resolved. He demonstrated lower limbs weakness and right arm weakness 2 years later. Image showed cervical kyphosis with compressive myelopathy. Posterior decompression with internal fixation was done, but his condition deteriorated post-operatively. The slit-valve shunt system was surgically removed and an external drain was placed. The patient's CSF pressure was lower than 0 initially and gradually raised to clinically tolerable levels. Once the optimal pressure was identified, a programmable shunt was placed with the valve set at the same level (19cmH₂O). The patient's neurological status improved, and the epidural veins had returned to their normal size on follow-up imaging. The authors describe this rare complication with the unique treatment strategy and review the literature on epidural venous engorgement as it relates to intracranial hypotension due to over-shunting.

Keywords: Intracranial hypotension, Cervical myelopathy, Epidural venous engorgement, Shunt, Pediatric neurosurgery

EP-0218 [Pediatric Neurosurgery » CSF Disorders]

Endoscopic Third Ventriculostomy in Secondary Hydrocephalus

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Background: Since the introduction of neuro endoscope in the last century, it was the mainstay treatment of hydrocephalus secondary to third ventricular cysts and tumors, craniopharyngiomas, pineal body tumors, posterior fossa tumors. Preoperative MRI & MRA brain is mandatory to know the course of the posterior communicating arteries and to know the presence or absence of Lilliequist membrane. Our aim of the study is to report our experience in the cases with secondary hydrocephalus that are treated by ETV (endoscopic third ventriculostomy).

Method: A prospective randomized study was conducted to thirty-two patients who have secondary hydrocephalus. They were collected from January 2011 to December 2013. Patients were classified into two main groups according to the age at time of presentation. Group A: childhood group from age 5 to age 18, Group B: Adult group (above 18 years). They are followed up for one year after the procedure.

Results: Twenty-four patients (75%) improve significantly postoperatively. Five patients (16%) require second revision of the ETV, Two of them (6.4%) show the failure of ETV due to the closure of the subarachnoid space and v-p shunt was applied. One case shows memory disorders and another case show postoperative CSF leak. Another case (3.2%) died 5 days after the operation due to intraventricular hemorrhage.

Conclusion: The results were better in pediatric patients in comparison to the adult group. Early diagnosis, good selection of the candidate patient's and surgeons experience play a fundamental role in the prognosis of those patients.

Keywords: Secondary hydrocephalus IVH (intraventricular hemorrhage) CSF (Cerebrospinal fluid), ETV (Endoscopic third ventriculostomy), VP shunt, (Ventriculoperitoneal shunt).

EP-0219 [Pediatric Neurosurgery » CSF Disorders]

Special Features of Diagnostic and Operative Tactic for Severe Brain Herniation with Hydrocephalus in Different Age Groups

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Background: The anatomic and physiological features of the brain and somatic background of patients with brain hernia at different ages significantly affects ways of diagnosis, treatment and prognosis of brain herniations.

Method: We examined 20 patients with severe cases of brain herniation, treated at the RSCN from 2011 to 2015. The first group included 10 patients aged 1 to 3 years with brain herniation and hydrocephalus, second group consist of 10 patients 1-6 month old. All patients underwent neurological and instrumental survey methods.

Results: All patients were operated. With relatively same neurological status, mechanism of hernia, hernia sac volume, clinical and neurological state in postoperative period was different in both age groups. So 5 patients without hydrocephalus were observed violation of hemodynamic changes and respiratory activity. Only 5 patients, along with hydrocephalus hernia defied medical correction. Abnormalities in a more severe form were detected in patients in group I, despite the fact that gross neurological disorders observed equally often in both age groups. This is primarily due to the clinical course of severe brain herniation in patients newborn and childhood. They have a marked decrease in the functional state of the physiological systems of their reactivity.

Conclusion: Thus, early diagnosis can improve outcomes, reduce the degree of disability of children with cranial hernia.

Keywords: Brain herniation, Hydrocephalus, Hernia sac

EP-0220 [Pediatric Neurosurgery » CSF Disorders]

Total Resection of Ventriculo-peritoneal Shunt Depended Giant Abdominal Pseudocyst

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Ventriculo-peritoneal shunt complications are reported to occur at a rate of approximately 26%. Abdominal complications include peritonitis, ascites, bowel and abdominal wall perforation and inguinal hernias. An uncommon but recognized complication is an abdominal pseudocyst, with cerebrospinal fluid collecting and being poorly or not absorbed across the serosa. This results in an increased pressure within the cyst, reducing forward pressure gradient and optimal shunt function. In our case we present a four year old boy who diagnosed ventriculoperitoneal shunt

depended giant abdominal pseudocyst. Open abdominal surgery performed. Cyst removed completely in one piece and shunt catheter repositioned. The cerebrospinal fluid was clear, colorless, acellular and sterile. The reported incidence of an abdominal pseudocyst formation ranges from 0.33% to 68%. In most cases, the etiology is not identified. Abdominal pseudocyst presents variable symptoms and asymptomatic and it should be always remembered following examinations of the patients.

Keywords: Giant abdominal pseudocyst, Ventriculoperitoneal shunt complication

EP-0221 [Pediatric Neurosurgery » CSF Disorders]

Management of Ventriculo-Peritoneal Shunt Calcification

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Shunt calcification is a rare complication of ventriculoperitoneal shunting which occurs years later after the initial operation. Shunt calcification has been observed mainly in barium-impregnated catheters. The usual complaints of the patients suffering from this condition are pain in the neck and chest wall along the shunt pathway and limitation of the neck movement due to shunt tube tethering, but features of shunt dysfunction and skin irritation above the shunt may be present. It is shown pre operative skin irritations on neck and abdomen by photographs, plain X-rays and operative findings that the most extensive calcification is present in the neck, where the catheters were subject to heavy mechanical stress. Disturbed calcium and phosphate metabolisms may be involved in this condition. Shunt calcification is a rare condition that occurs due to material aging presenting with features of shunt tethering, dysfunction or overlying skin irritation. Physical examination, plain X-ray is needed to detect calcification while shunt removal with or without replacement.

Keywords: Calcification, Shunt complication, Shunt dysfunction

EP-0222 [Pediatric Neurosurgery » CSF Disorders]

Repeat Endoscopic Third Ventriculostomy

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Endoscopic third ventriculostomy (ETV), even though success rates varying up to 90%, fails within the first year, in about 20% of the patients. If the primary ventriculostomy fails, general opinion is to insert a ventriculoperitoneal shunt (VP), rather than to attempt a repeat ETV. We present in this paper, a patient who underwent ETV when she was 4 months old. After one month, it seems that there is no any improvement about her hydrocephalus, so she underwent VP shunt surgery. 3 months later after second operation, shunt dysfunction was observed with high infection parameters. Shunt was removed and ETV was applied as third operation when she was 8 months old. During repeat ETV surgery, Scar tissue was observed both premamillary membrane and entry point of aqueduct of Sylvius. These membranes were cauterized again around the scar tissue. There were no complication during repeat ETV. It is safe and applicable. Further, the success rate of repeat ETV was 83% in literature. As a conclusion, repeat ETV has a low complication and

high success rate and in selected patients it may provide a chance for shunt free survival.

Keywords: ETV, Repeat ETV, Hydrocephalus

EP-0223 [Pediatric Neurosurgery » CSF Disorders]

Intraventricular Migration of Total Shunt System- Experience of Two Consecutive Cases

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Complications of Ventriculoperitoneal shunt is very common. These include infection, blockage at the proximal or distal end, shunt tube fracture, extrusion of the peritoneal end through the abdominal port site, urethra, anus and elsewhere. Migration of the total shunt system into the ventricle is a very rare complication and only a few cases were reported worldwide in our Neurosurgical arena. In our center, we found 2 such cases. The first patient was of 9 month age and revision was done on 15th February 2012. The second baby was of 5 month age and revision was done on 19th November 2013. Peri-operative sequences were observed very carefully and a probable mechanism of migration has been postulated (Pascal's law of force hypothesized here). In both the cases, previous shunt systems were re-positioned. The patients were doing well till the last follow-up.

Keywords: V-P shunt, Intraventricular, Migration, Pascal's law

EP-0224 [Pediatric Neurosurgery » Others]

Bobble Head Doll Syndrome in the Suprasellar Arachnoid Cysts and Literature Review

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Background: The arachnoid cysts represent 1% of all intra cerebral lesions. 9% of them are supra sellar. Their pathophysiological basis are still undetermined. The bobble head doll movement is a rare clinical manifestation of this syndrome.

Method: Our series concerns 5 patients treated by endoscopic approach 03 patients presented with headache due to intracranial hypertension with abnormal movements (Bobble head doll syndrome). All our patients were explored by CT scans and MRI.

Results: The 5 patients were treated by endoscopic methods: a fenestration with marsupialization with good outcomes post operatively. Supra sellar arachnoid cysts are frequent amongst children under 5 years especially in male population. Bobble head doll syndrome are very rare clinical presentations only cases were described worldwide in various pathologies (craniopharyngiomas, colloid cysts of the third ventricle, supra sellar arachnoid cyst.....) but they are frequently associated with the third ventricle tumors and supra sellar arachnoid cysts.

Conclusion: The rarity of BHDS can render diagnosis of a supra sellar arachnoid cyst very difficult. When diagnosis and treatment are made late, the neurological dysfunction can become permanent. The endoscopic tool has facilitated a minimally invasive approach in this case.

Keywords: Bobble head doll movement, Arachnoid cysts, Suprasellar, Endoscopic methods

EP-0225 [Pediatric Neurosurgery » Others]

Surgical Outcomes of Intradural Spinal Abscesses: A Serie of Three Patients

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Despite the improvement of technologies in medical treatment, the prognosis for intradural spinal abscesses (ISAs) has remained serious entity largely unaffected especially when they had been late diagnosed. Spinal abscesses (SAs) generally occur in extradurally, whereas they rarely occur in intradural region. In this study, the surgical outcomes of 3 consecutive patients with intradural spinal abscess have been evaluated. Medical records of 20 patients with spinal abscess which underwent surgery at Bezmialem Vakif University and Bakırköy Ruh ve Sinir Hastalıkları Hastanesi between 2012 and 2016 were retrospectively reviewed. All ISA cases were selected as the core sample used for this study. The patients' gender, age, complaints, prodrome, location, causative pathogen, surgical outcomes, and complications had been investigated. Three cases of IDAs were surgically treated. Two patients were female and one was male. The mean age was 19.4 ± 18.2 (3-39) years. The most common complaints were gait disturbance and weakness of lower extremities (100%). The mean prodrome was 5.8 ± 2.9 (4-10) weeks. The causative pathogens were MRSA and Tbc. The pathogen of one child was non-tuberculosis microbacterium in extramedullary abscess. On the postop 44th month, the patient presented with the same symptoms. The child was underwent surgery for intramedullary abscess. The causative pathogen was E.coli. The improvement was seen only in the child who reoperated for intramedullary abscess. Two patients had poor clinical outcomes (unchanged) at their last follow-up after 24.3 ± 25.8 (7-54) months of average. IDAs as same as all abscess have to undergo surgical drainage of abscess and antibiotic usage. Early diagnosis and urgent surgical treatment are important for good prognosis.

Keywords: Spinal intradural abscess, Intradural-extramedullary, Intradural-intramedullary, Abscess drainage, Antibiotic use

EP-0226 [Pediatric Neurosurgery » Others]

The Particularities of Brain Trauma in Child of the Breast Age

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Background: Craniocerebral injuries are the most wide-spread type of the injuries, consists 36-40% of all injuries. In children of the breast age the main reason of the brain injuries are home factors: fall from different heights incidentally due to less attention of parents. The purpose of the study is to study clinic features of craniocerebral injuries in children of the breast age.

Method: During 2012-2016 were admitted 110 children of the

breast age with craniocerebral injuries: 78 with mild, 25 with moderate, 7 with severe craniocerebral injuries. Although severe craniocerebral injuries have different clinical features, characteristic for early age, basically accompanied with heavy conditions, with similar pathophysiological and clinical manifestations in children of the senior age.

Results: Mild and moderate head injuries of breast age children often course without clinical manifestations, both common cerebral and local. The reason for referring to hospital is a casual finding by parents the edema in head and capricious of children. Meantime, in the absence of clinical symptoms in breast age children, on X-ray examination revealed fractures of the skull. On CT revealed zone of lowered density close on tomodensimetric factor to edema of the cerebrum. In some cases existent somatic signs such as increased body temperature, anxiety, dyspepsia cause to admit children to non specialized branches.

Conclusion: Craniocerebral injuries in children of the breast age has characteristic features and does not pass without leaving a trace. Amounts of consequences of craniocerebral injuries in children of the early age make stationary examination amenable.

Keywords: Craniocerebral injuries in children, Breast age, Different clinical features

EP-0227 [Pediatric Neurosurgery » Others]

Hydatid Cyst of Orbit: A Case Report

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Orbital hydatidosis is uncommon, accounting for 1 to 2% of all localizations. It is caused by Echinococcus granulosus, a dog parasite tapeworm. We report an intra-orbital hydatid cyst observed in a five-year-old girl, presenting the main features of this unusual localization. Hydatid cyst should be evoked in case of tumorous exophthalmos in young patients, especially in children having lived in endemic zones. The preoperative diagnosis is based on clinical findings and ultrasonographic, computed tomographic and MRI findings. The fronto-orbital approach is most commonly used for treatment. Infectious and functional prognosis depends on early surgery.

Keywords: Hydatid cyst, Orbit, Echinococcus granulosus, Exophthalmia, Surgery

EP-0228 [Pediatric Neurosurgery » Others]

Management Strategy in Pediatric Colloid Cysts

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Background: Colloid cysts are uncommon lesions in pediatric age group, which most commonly occur in the fourth through fifth decade. We report the largest series of colloid cysts in the pediatric age group.

Method: A retrospective study was conducted on all patients of colloid cyst that underwent surgery at our institute over a period of January 2002 to August 2016 (15 years). Patients 18 years or less are included in the study. They were analysed on Clinical presentation, radiological findings, surgical approaches and outcome.

Results: Age ranged from 8 to 18 years. The male-to-female ratio was 3.5:1. Headache and vomiting were the most common symptoms. Papilloedema was the most common clinical sign. Pre-operative CT showed a hyperdense non-enhancing lesion in the majority. Of these 36 patients endoscopic removal was attempted in 14, in one of these colloid cysts could not be removed endoscopically and converted into transcortical transventricular excision. In 5 patients underwent transcortical transventricular excision, while transcallosal approach was performed in 17 patients. Post-operatively 5 patients had CSF leak from wound site, all were managed conservatively. One patient had operative site extra dural hematoma underwent re-exploration surgery. A mean follow-up of 11.6 months was available in 26 patients; the majority were asymptomatic during follow up.

Conclusion: Colloid cysts in the young are thought to be more aggressive clinically and radiologically and therefore, early surgical intervention is indicated. Endoscopic or microscopic surgery is surgeons preference.

Keywords: Colloid cyst, Paediatric, Endoscopy

EP-0229 [Pediatric Neurosurgery » Others]

Giant Cerebral Hydatid Cyst in a Peruvian Child. Case Report

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Hydatid disease is a parasitic infection caused by *Echinococcus*. Commonly, it affects liver and lung; involvement of brain accounts from 2% to 8%. A 13-year-old girl was admitted in the National Institute for Children-San Borja, presenting disorientation and macrocephaly. Head CT scan showed giant single cystic lesion that occupied both frontal lobes. Patient underwent surgical resection, and a hydatid cyst was diagnosed in the operating room. Peru has endemic areas of hydatid disease. It is the first report of a giant cerebral hydatid cyst in a Peruvian child.

Keywords: Hydatid cyst, Brain, Children

EP-0230 [Pediatric Neurosurgery » Others]

Decompressive Craniectomy for Infants: A Case Series of Five Patients

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Background: Management of cerebral edema in infants is challenging. Decompressive craniectomy in young age has shown favorable outcomes for management of intracranial hypertension, but current literature is scarce and consists of only case reports or small series. The purpose of the current study is to report the challenges faced with this procedure and its complications in this peculiar age group.

Method: This is a retrospective chart review of infants (less than

1 year of age) undergoing unilateral or bilateral decompressive craniotomy at a tertiary care hospital in Pakistan. Kochi score was used to score outcomes of five infants who underwent the procedure.

Results: Five infants were included in this series. Operative time for decompressive craniectomy (DC) ranged from 1 h and 40 min to 4 h. Three infants survived to undergo cranioplasty. Two infants recovered with good Kochi scores of 5a and one infant developed hemiparesis (Kochi score 3b).

Conclusion: Decompressive craniectomy carries good outcomes in selected patients. Risk of bleeding and hemodynamic instability makes this procedure challenging. We found coagulopathy in four of the five patients which poses another challenge to the surgical management of these patients and has not been stressed enough in the previous literature.

Keywords: Decompressive craniectomy, Cranioplasty, Coagulopathy, Infants, Hydrocephalus

EP-0231 [Pediatric Neurosurgery » Others]

Syndrome of Sturge-Weber-Krabbe

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This syndrome is a rare phacomatose with vascular malformatif substratum. It is responsible for neuro-ophthalmologic and cutaneous demonstrations sometimes handicapping. With an aim of analyzing the clinical signs, the radiological and therapeutic means, we present two observations of two reached of this syndrome. It's about a 19-year-old teenager who presents since childhood an epilepsy with a left hemiparesis and a right facial angioma. The other is a six-year-old who has isolated epilepsy. The cerebral CT scan had objectified especially occipital calcifications. The cerebral angiography was normal as well as angiography MRI in the child. The antiepileptic treatment could stop seizures. The cerebral CT scan especially the MRI are the exams of choice. The angiography has little interest because often normal. The treatment is primarily medical. The surgery is seldom indicated especially in the cases resistant to the medical treatment or in the event of cerebral atrophy. The evolution depends on the stage of the diagnosis and the gravity of the lesions.

Keywords: Sturge-Weber-Krabbe, Angiomatose encéphalo trigéménée

EP-0232 [Pediatric Neurosurgery » Others]

Multiple Cranial Nerve Palsies in Patient with Decompensated Hydrocephalus

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The most common cranial nerve palsy reported in patients with elevated intracranial pressure is abducens nerve palsy elucidated as a consequence of its longest intracranial course of all the cranial nerves. We report a case of acute multiple cranial nerve palsy in a boy with shunt malfunction. At the age of 6 months ventriculoperitoneal shunt was implanted due to a hydrocephalus. At the age of 9, boy presented with headache and vomiting several

days before hospitalization. Night before admission to our ward cranial nerve palsies suddenly occurred, as well as drowsiness. Neuro-ophthalmological exam revealed left hypertropia with lateral gaze palsy on the left side and papilloedema. Neurological examination revealed also a left peripheral facial nerve palsy. CT scan showed asymmetric dilatation of left ventricle, hydrocephalus and malposition of cranial catheter. No bone or brain anomalies were visualized. Emergency shunt revision was done immediately after admission – reposition of the ventricular catheter, and reconnection with the rest of the implanted system. The resolution of symptoms of intracranial hypertension was apparent after surgery. Graduated recovery of the abducens and trochlear nerve palsy have occurred in next three weeks, and facial nerve palsy 13 months after surgery. To the best of our knowledge, this is the first reported case of a patient with combined abducens, trochlear and peripheral facial nerve palsy resulting from malfunctioning ventriculoperitoneal shunt. Possible pathophysiological explanation could be a terminal neural decompensation as a consequence of progressive intracranial hypertension in patient with asymmetric high-pressure hydrocephalus.

Keywords: Abducens nerve palsy, Facial nerve palsy, Trochlear nerve palsy, Ventriculoperitoneal shunt

EP-0233 [Pediatric Neurosurgery » Others]

Anterior Temporal Lobectomy with Selective Amygdalohippocampectomy in Patient with Temporal Lobe Epilepsy Due to Focal Cortical Dysplasia: A Case Report

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Focal Cortical Dysplasia (FCD) is a neurodevelopment disorder which usually associates with intractable Temporal Lobe Epilepsy (TLE) in children. This kind of epilepsy is a difficult challenge for the treating pediatric neurologist. We reported a case of 4-year-old right handed male patient who was referred to emergency department in our hospital with decrease of consciousness after seizure. The patients had history of refractory epilepsy since 3 years before. His brain MRI suggested an FCD. We then did Anterior Temporal Lobectomy (ATL) with selective amygdalohippocampectomy to the patient. There were no seizure and no complication after surgery (Engel classification scale Class I). We find that ATL with selective amygdalohippocampectomy is an effective and safe surgical option for pediatric patients with TLE due to FCD.

Keywords: Focal cortical dysplasia, Epilepsy, Anterior temporal lobectomy, Amygdalohippocampectomy, Pediatric neurosurgery

EP-0234 [Pediatric Neurosurgery » Others]

Recovered Landau-Kleffner Syndrome After Multiple Subpial Transection: Case Report

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Landau-Kleffner syndrome (LKS) is a childhood disorder characterized by acquired aphasia, epileptiform electroencephalographic (EEG) abnormalities, cognitive impairment and global behavioral regression. Multiple subpial transection (MST) is an alternative to drug-resistant LKS, but the evidence is controversial as to the benefit on clinical outcome. In this study, we report the case of 4 years old patient with LKS submitted to MST in our service. The girl was born normal and reached all the milestones of development, including expressive language. The first symptoms manifested at 3 years, with focal seizures on the right cheek. Evolved with regression of language for aphasia of expression and behavioral change, characterized by irritability and agitation. EEG obtained in wakefulness before surgery presented a slow basal tracing to the left, spikes associated with slow waves in the left centrotemporal region that radiated to the contralateral homologous region and/or generalized accompanied by body movements and fixed stare. The seizures were controlled with drug therapy, but aphasia remained refractory to this treatment. Multiple subpial transection was performed in the left frontoparietal region guided by transoperative electrocorticography. Before surgery, transoperative electrocorticography showed almost continuous discharges in Broca's region, with extension, in smaller intensity, to Wernicke's region. After the MST there was a significant reduction of discharges in these regions. On the first postoperative day, there was a slight improvement in language, which evolved to complete sentences in two weeks.

Keywords: Landau-Kleffner syndrome, Multiple subpial transection, Neurosurgery

EP-0236 [Pediatric Neurosurgery » Others]

A Case of Intracranial Suppuration with Epidural, Subdural and Parafalcine Collections

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Despite the advances in modern neuroimaging techniques, neurosurgical techniques and newer generation antimicrobial agents, intracranial suppuration, (i.e. subdural empyemas and epidural abscesses), still remains a potentially fatal CNS infection to date. These pus collections still remain a formidable diagnostic and management challenge, often resulting in significant morbidity and mortality. In this case report, a description is made, of a case of a 10

year old female patient who presented with both subdural empyema and epidural abscess and was managed successfully by emergency surgical evacuation of pus and high dosage intravenous antibiotics with good outcome.

Keywords: Intracranial suppuration, Subdural empyema, Epidural abscess

EP-0237 [Pediatric Neurosurgery » Others]

Intramedullary Abscess of the Spinal Cord without Any Predisposing Factor: A Case Report and Review of the Literature

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Intramedullary spinal cord abscess (ISCA) in children without meningitis is an extremely rare condition of the central nervous system, it is probably a devastating neurological condition and it is difficult to diagnose immediately, as this condition is one of the treatable conditions of paraparesis. We concluded that early diagnosis and treatment is crucial; before a dangerous vascular insult of the spinal cord is established from rapid formation of the abscess and an expansion of the spinal cord within the limited intraspinal space. In this communication, We report a case in child treated successfully with surgical resection, intravenous antibiotics and neuro rehabilitation between 2016 and 2017 and discuss the result.

Keywords: Intramedullary spinal cord abscess, Dermal sinus, Myelotomy

EP-0238 [Pediatric Neurosurgery » Others]

Percutan Multiple Brain Abscess Drainage in Pediatric Patients

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Brain abscess are uncommon, intraparenchymal infection that commences as a localized area of cerebritis evolving into a collection of encapsulated purulent material after many stages. In the pediatric population they are mostly seen in children between 4 and 7 years of age. The infection is a cause of hematogenous spread from remote sources, direct invasion, foreign material introduced through a penetrating traumatic injury. Once formed, a brain abscess can result in permanent neurological disability by compression, infarction or destruction, cause severe morbidity and mortality in significant rates. In our case 4 year old female child presented with lethargy and poor feeding for 3 months. The MRI of the patient revealed multiple contrast enhancing well circumscribed mass lesions with brain edema and 7mm midline shift. After the radiological evaluation, the urgent percutan drainage of the abscess was made considering the clinic progress of the patient. The largest lesions which located right frontal lobe and right temporomesencephalic area were evacuated with two different burr holes are used for each abscess. After the surgery, initial antimicrobial therapy was administered and the patient had a full recovery with 1 month medical treatment. Brain abscess are rare and fatal particularly in children but early diagnosis

and treatment reduces morbidity and mortality. Considering the clinic signs of patient, evacuation of the abscess urgently provides sampling the purulent material in cyst and removing mass effects of abscess. Percutaneous drainage can be considered to use draining abscess by entering through the cyst easily and evacuating cyst material.

Keywords: Brain abscess, Percutaneous drainage, Emergency

EP-0239 [Pediatric Neurosurgery » Others]

Acute Brain Edema in Child Anaphylaxis by Ant Bites

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The ant stings can cause serious allergic reactions in sensitive individuals, often resulting in severe anaphylaxis. Neurotoxic reactions rarely occur, which include focal or generalized seizures, blurred vision, fainting, loss of consciousness, confusion, and peripheral neuropathy. 3 years-old male patient presented lowering of level of consciousness, glasgow 10 with signs of edema and periorbital skin, insect bites on face and mmii.Com history of atopy. Subfebrile without focal signs. Fundoscopy showed papilledema. CT of the brain showing intense cerebral edema and severe cranial hypertension. By introducing steroids, antihistamine and mannitol in pediatric maximum doses, with reversal of the clinical and CT.He was discharged from the pediatric ICU and hospital discharge in 48 hours in seven days, cured. The ants commonly found in Brazil belong to the species *Sonelopsis invicta*. Are very common in southeastern and southern Brazil. People bitten by ants may develop delayed hypersensitivity-type reactions, and eventually present severe allergic reactions to their bites. The neurological injuries, such as occurred in our patient, are rare. The mechanism of brain injury is probably due to neurotoxic venom induced by hypoxia or hypotension. The ant stings can trigger allergic reactions in some people important, life-threatening, especially if we consider that these insects have adapted to living inside houses. So all professionals working in emergency services, should pay attention to the possibility of ant bites and look for characteristic lesions in the extremities, especially the legs

Keywords: Acute brain edema, Child, Anaphylaxis, Ant bite

EP-0240 [Pediatric Neurosurgery » Others]

Guillain-Barré Syndrome Following Pilocytic Astrocytoma: Case Report

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Pilocytic astrocytomas are the most common tumor of cerebellum under 20 years of age. Guillain-Barré Syndrome (GBS) is an inflammatory disorder of the peripheral nervous system which is usually presented with symmetrical and manifests itself with muscle weakness arising from the feet to upward. We present

a case operated for pilocytic astrocytoma which was diagnosed as GBS two years after operation. A five-year-old male patient referred to neurosurgery outpatient clinic for vomiting, headache and impaired balance. On cranial magnetic resonance imaging (MRI), a mass with posterior fossa localization was detected and removed totally by microneurosurgical method. Pathology was pilocytic astrocytoma. Neurological examination was usual in the postoperative period. Two years after the surgery, the patient was admitted to the emergency service due to walking difficulty for 5 days. Bilateral lower extremity muscle strength was 3/5. In cranial and whole spinal MRI, there was no recurrence, but S3 level contrast enhancement was observed. The electromyogram of the patient referred to the pediatric service revealed sensory motor, axonal and demyelinating polyneuropathy. An albuminocytoc dissociation was observed in the lumbar puncture cerebrospinal liquid tests. The patient was treated with GBS diagnosis and discharged on foot for physical therapy. The patient was followed up without any problems. After 2 years, muscle strength loss and sacral involvement images in MRI required further investigation. Sacral involvement can also be seen in the literature in cases of GBS. Spinal seeding metastases are very rare in pilocytic astrocytomas. GBS and seeding metastasis should be kept in mind in a patient with a progressive neurological deficit who have pilocytic astrocytoma previously.

Keywords: Guillain-Barré syndrome, Pilocytic astrocytoma, Sacral involvement

EP-0241 [Pediatric Neurosurgery » Others]

Dominant Hemisphere and Upper Cervical Cord Tumefactive Multiple Sclerosis in a Nigerian Teenager Initially Misdiagnosed and Managed as Glioma

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Multiple Sclerosis has ethnic and geographical prevalence differences and Tumefactive Multiple Sclerosis (TMS) is rare. We report the first case of TMS in a Nigerian, initially misdiagnosed as a glioma of left hemisphere and the cervical cord. A 12 year-old girl presented with 11 weeks history of progressive visual loss, followed by right hemi-body weakness which progressed to quadriplegia, dysphasia, severe headache, tonic-clonic seizures, neck pain, vomiting and fever. She has had previous hospitalisations without firm diagnosis at other hospitals. Findings were GCS (E4M6V2), right handed, dysphasia, depression, VA of CF bilaterally and supple neck. She had global hypotonia and hyper-reflexia with +ve Babinski. Right hemiplegia (0/5) but left hemiparesis 4/5(UE), 2/5(LE). MRI revealed three cystic open ring enhancing masses in the left fronto-parieto-occipital region measuring (45x52x54mm), (34x43x58mm), (54x43x42mm) with associated edema and midline shift. Cervical spine MRI revealed C2-C4 intramedullary mass with cord edema. Following diagnosis of cystic brain tumour with spinal cord metastasis, then biopsy but histology revealed inflammatory lesion. A second aspiration / biopsy did not confirm abscess. Final diagnosis was TMS, she responded to Methylprednisolone and was discharged home. Follow-up clinical condition and MRI have

been satisfactory. This rare disease can easily be misdiagnosed when index of suspicion is low. In resource poor areas, pattern of MRI open ring enhancement is a reliable diagnostic guide and may prevent unnecessary extensive neurosurgical intervention.

Keywords: Tumefactive multiple sclerosis, Management challenges, Nigeria

EP-0242 [Pediatric Neurosurgery » Others]

Focal Cortical Dysplasia: Diagnosis and Treatment (Case Report)

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Focal cortical dysplasia was first described by Taylor et al in 1971. Since it has been shown that it can have a wide variety of histological types. But these forms of dysplasia can't be differentiated imaging. In most cases we don't find etiological factor, but the possibility of a prenatal ischemic pain has been suggested by some authors. Total excision allows to have good outcome as described in our case. Indeed, we report the clinical case of a little girl followed since age 09 month which has since 09 month a refractory epileptic seizure under triple antiepileptic therapy with a normal neurological examination. Brain MRI with diffusion sequences showed right frontal focal cortical dysplasia. The child was operated using neuronavigation, with good outcomes and a disappearance of seizure. In total, focal cortical dysplasia is a common cause of refractory epilepsy especially in children and whose total surgical excision allows good postoperative results. Early diagnosis is essential to avoid serious sequelae of epilepsy and improves the quality of life of the child.

Keywords: Focal cortical dysplasia, Refractory epilepsy, Diffusion MRI

EP-0243 [Pediatric Neurosurgery » Others]

CNS Dermoid: A Report of 2 Cases with Review of Literature

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Dermoids are slow growing lesions of CNS and accounts for approximately 0.3% or less of all primary intracranial tumor. A little more incidence in female than male. Typically it presents in the first three decades of life. We managed two patients with CNS dermoids. Our 1st patient a 12 yrs old girl was presented with occipital headache for 6 months, but on neurological examination reveals no deficit. On MR imaging it shows a posterior fossa midline hypointense lesion in T2W and mixed intensity on T1W images. Per-operative finding was very interesting is that it looks like grease and sticky on gully pot. Skin appendages were also found with this lesion. Another patient, a 11 yrs old girl was presented with severe weakness in both lower limb. On examination she reveals grade 2 paraparesis and a dermal sinus over skin of the back at D10 level. On MR imaging an extra dural hypo intense on T1W and Hyperintense on T2W lesion was evident. Complete excision was done both extra and intramedullary part of tumor. Hair was implanted within the cord. Histological diagnosis waere dermoid

tumor. Both the cases were successfully operated. Post operative outcome was good and symptoms were relieved. Paraplegia of the 2nd case was improving. Dermoids are benign tumor and CNS dermoids are rare lesion. Surgery is the only effective treatment to this lesion, and total removal is the surgical goal, but subtotal excision also is a wise choice when total removal is very difficult.

Keywords: Headache, Dermoid tumor, MRI, Posterior fossa, Paraplegia, Hypointense, Hyperintense

EP-0244 [Pediatric Neurosurgery » Others]

Early Diagnosis and Treatment of Non-Traumatic Intracranial Hemorrhage in Infants

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Background: The basis of the presentation of the material included the analysis of medical records of children with convulsive state passed through the emergency department of anaesthesiology and intensive care FFNTSEMP over the past 3 years, from 2014 – 2016.

Method: With seizures has been treatment 85 patients (100%) with perinatal pathology in history with convulsive disorders - 29 patients (34%) between the ages of 1 month to 1 year. The study group included only children with seizures in the background neurotoxicosis somatic pathology.

Results: Analysis of the clinical examination, observation and analysis of medical records passed through OARIT showed that in 29 patients during seizures. It was sharp and non-traumatic intracranial hemorrhage events. Among children with neurotoxicosis clonic-tonic convulsions pervasive noted in 17 patients (58.6%), unilateral convulsions in patients (41.3%). It should be emphasized that in this group of patients with pathology of prenatal and early postnatal nature of the period in history was revealed in 60% of cases. Almost all patients with symptoms of neurotoxicity children combined convulsive syndrome and spontaneous bleeding events observed morning sickness during the second half of pregnancy, TORCH infection or a negative obstetric history mothers.

Conclusion: In children with complicated obstetric history and after the TORCH infections, myocardial pathological process has a significant negative effect on the physiological state of the vascular wall of the blood-brain barrier. Which may be complicated by spontaneous hemorrhage with hypertension syndrome, ie. perinatal lesions of the nervous system at the height of seizures

Keywords: Nontraumatic, Children, Neurotoxicosis somatic pathology

EP-0245 [Pediatric Neurosurgery » Others]

Giant Cerebellar Tuberculoma Mimicking a Malignant Tumor

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Isolated central nervous system (CNS) tuberculoma is rare. Central nervous system tuberculosis (TB) is associated with high morbidity and mortality despite modern methods of detection and treatment. The authors report a case of a giant cerebellar tuberculoma mimicking a malignant tumor and review the literature. A six-year-old girl, with no past medical history, vaccinated for her age, presented with a three-month history of occipitocervical cephalalgia, complicated by gait disturbances. The MRI showed a left cerebellar tumor suggestive of a medulloblastoma. At surgery, a nodular, avascular lesion was found and pathological examination confirmed tuberculoma. Intracranial tuberculoma is an uncommon variety of central nervous system tuberculosis. The prognosis is related to the rapidity of diagnosis, surgical resection and the complementary antituberculosis treatment. Intracranial tuberculoma is an uncommon variety of central nervous system infection. Prognosis is improved by a quick diagnosis, surgical removal, and associated antituberculosis therapy.

Keywords: Tuberculoma, Central nervous system, Surgery

EP-0246 [Pediatric Neurosurgery » Others]

Differentiated Treatment of Patients with Spastic Form of Cerebral Palsy

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A clinical study of 30 patients with spastic infantile cerebral palsy (ICP). All patients underwent complex clinical, neuroimagine and neurophysiologic studies, including the spasticity assessment by Ashworth Scale, electroneuromyography and others. According to conducted treatment patients was divided into 3 groups. First group (15 patients) were conducted endolumbal insufflation, in the second group - 8 patients applied botulinum-toxin type A injection (Neuronox). In third group 7 patients was conducted destructive neurosurgical operation – Selective dorsal rhizotomy (SDR). Endolumbal insufflation was successful in patients with severe mental or convulsive disorders. Spasticity reduced to 1 point by the Ashworth scale at 6 of 15 patients. In patient with prevalence of spasticity and locomotor dysfunctions, along with relative preservation of mental abilities were used treatment with botulinum-toxin and SDR. In all 8 patients was observed improvement of the limbs state, with positive effect up to 3 points on the Ashworth. Conducting intensive rehabilitation therapy for a botulinum-toxin activity period, improved a locomotor function and prevented a full return of spasticity. Third group patients performed destruction of sensitive roots of the spinal cord involved in spasticity reflex. Indications for this operation was the presence of the expressed spastic syndrome in both lower limbs without isolated muscles group restrictions. The result of treatment options held in our clinic for patients with ICP depended on the ongoing further rehabilitation. Reducing the muscle tone did not improve patients' quality of life by itself, without an additional therapeutic exercise, massage and physical therapy.

Keywords: Cerebral palsy, Selective dorsal rhizotomy, Botulinum-toxin type A injection

EP-0247 [Spine and Peripheral Nerve » Basic Science]**Quantification of Spinal Cord Pulsation Using Intra-Operative Ultrasound and Its Correlation to Cardiovascular Parameters**

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Background: Spinal cord pulsation (SCP) results from transmitted arterial pulsation within the nervous system. While many reports recognized increased SCP as sign of adequate decompression, little is known about the correlation between SCP and cardiovascular parameters. The assessment of this correlation is the aim of the current study, to provide more insight on interpreting SCP.

Method: All consecutive patients who had cervical spine surgery from 2012-2015 with intraoperative ultrasound (IOUS) were included. SCP was identified by analyzing spinal cord wall movement (SCWM) using an image processing software (Fiji). Spinal cord decompression status was classified into 3 types based on SC contact with anterior structures of the cervical spine (Type 1: not touching, Type 2: when intermittently touching, and Type 3 when continuously touching).

Results: Twenty-two patients were included (16 males and 6 females, mean age 52 years). Pathologies included 14 patients with degenerative spine disease, 3 with type-1 Chiari malformation, and 5 others (infection, trauma, abscess). SCWM ranged from 0.07-1.76 mm (mean 0.44 mm). SCP ranged from 18-87 beats per minute (bts/min); mean 59 bts/min. Although not statically significant, patients with completely decompressed SC (type 1) showed the highest pulsation rate (mean 64 bts/min) and the largest SCWM amplitude (0.54 mm). Both SCP and SCWM were not significantly associated with patients' age, sex, blood pressure, heart rate, respiratory rate, or hypertension diagnosis.

Conclusion: SCWM and SCP tend to increase with spinal cord that is not touching surrounding structures and are not correlated with stable levels of cardiovascular parameters. However, the response of SCP to variability in cardiovascular parameters needs to be assessed.

Keywords: Cervical spine, Spinal cord pulsation, Intra-operative ultrasound

EP-0248 [Spine and Peripheral Nerve » Basic Science]**Association of Inflammatory and Degenerative Biochemical Factors with Prolapsed Intervertebral Disc**

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Background: Chronic inflammation is associated with intervertebral disc (IVD) disorders, and expressed by cytokines cascade, initiated by proinflammatory interleukin-1 β and tumor necrosis factor- α (TNF- α). Matrix metalloproteinases (MMPs) and their inhibitors

(TIMPs) are specific enzymes activated during IVD degeneration. The potential resistance of IVD to compression depends on its concentration in proteoglycans (PGs). The purpose of this study was to explore the relation of inflammatory and degenerative factors with the age and in-hospital stay of patients with surgically-treated IVD prolapse.

Method: Sixty patients, 17-60 years old, who underwent discectomy for symptomatic IVD prolapse, were studied and divided into two a) age groups, A (≤ 40 years) and B (> 40 years), and b) postoperative hospitalization groups, I (≤ 5 days) and II (> 5 days). Blood samples were preoperatively obtained from each subject. Serum levels of TIMP-1, TNF- α , MMP-9 and PGs were measured with Enzyme Linked Immunosorbent Assay (ELISA).

Results: Group A had shorter in-hospital stay ($p < 0.001$), lower TNF- α ($p < 0.01$) and higher TIMP-1 levels ($P = 0.05$) compared to group B. In group B, TNF- α was positively correlated with MMP-9 ($p < 0.01$) and age ($P < 0.05$), and negatively with PGs ($p = 0.05$). Group I had higher TIMP-1 levels ($P < 0.05$) and lower TNF- α levels ($p < 0.01$) against group II. In common patients of the groups B and II, TNF- α levels were negatively correlated with TIMP-1 ($p < 0.01$) and PGs levels ($p < 0.001$), and positively with age ($p < 0.05$).

Conclusion: In young people with IVD disorders, chronic inflammation and disc degeneration do not seem to be significant for the clinical expression of IVD prolapse.

Keywords: Chronic inflammation, Degeneration, Intervertebral disc prolapse, Matrix metalloproteinases, Proteoglycans, Tumor necrosis factor- α

EP-0249 [Spine and Peripheral Nerve » Basic Science]**Use of Fat Grafts for Prevention Cerebrospinal Fluid (CSF) Leaks Following Lumbar Spinal Surgery**

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Background: Unintended durotomy is one of the most common complications in spine surgery far-lateral dural tears are problematic. Fat is an ideal sealant because it is impermeable to water. The aim of these study to give best management of Unintended durotomy to prevent CSF leaks.

Method: We prospectively evaluated 523 patients who underwent lumbar spine surgery from 2013 to 2016 in faculty of medicine cairo University. In this study we report the experience with using fat grafts for the prevention or repair of CSF leaks and proposes a technique in which a large sheet of fat, is used to cover not only the dural tear(s) but all of the exposed dura and is tucked into the lateral recess. Fibrin glue is spread on the surface of the fat and is further covered with Surgicel or Gelfoam.

Results: Unintended durotomy occur 26 patient. The hospital length of stay was 3 days in the decompression group and 5 days in the fusion group. The mean follow-up was 3 months, and there were 2 cases of cutaneous CSF fistula, and no cases of pseudomeningocele, or other complications, the two cases show postoperative CSF leakage and controlled by applying additional skin sutures.

Conclusion: The use of a fat graft results in excellent clinical outcomes with low incidence of postoperative cutaneous CSF fistula or other complications.

Keywords: Unintended durotomy, Spine, Surgery

EP-0250 [Spine and Peripheral Nerve » Basic Science]**The Effects of Smoking in the Perinatal Period and During Lactation on the Intervertebral Discs of Newborns**

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Aim: To evaluate histopathological effects of smoking before, during and after pregnancy on the intervertebral disc structure of the newborns in an experimental rat model.

Method: Seven adult female Wistar Albino rats were randomly allocated into 7 groups. Nicotine was intraperitoneally introduced to these rats in 6 groups before, during and after pregnancy, while rat in the control group received isotonic saline intraperitoneally. Fourteen newborns delivered by each rat were sacrificed at the end of 9 weeks after being breastfed for 3 weeks after birth. The vertebral columns of the sacrificed rats were removed en bloc and histopathological evaluation was performed on the intervertebral disc specimens. Histopathological alterations were noted and compared between groups.

Results: Ratio of proteoglycan amount exhibited significant difference between groups. Subjects in control group had predominantly mild amount of proteoglycans, while smoking before and during pregnancy as well as smoking before/during pregnancy and lactation resulted in deposition of severe amount of proteoglycans in IVD tissue. There was a statistically significant difference between groups with respect to the amount of fibrosis. In the control group, fibrosis was absent in the majority (78.6%) of subjects. Moderate degree of fibrosis was detected in groups with smoking during pregnancy, before and during pregnancy, during pregnancy and lactation as well as smoking before/during pregnancy and lactation.

Conclusion: Results of the current study imply that maternal smoking before and during pregnancy and in the lactation period may have deleterious effects on the intervertebral disc of the newborn. The duration of smoking and fertility period can influence the type and severity of these effects.

Keywords: Intervertebral disc, Degeneration, Nicotine, Smoking, Histopathology

EP-0251 [Spine and Peripheral Nerve » Basic Science]**Neuroprotective Effects of Epidural Electrical Stimulation in Spinal Cord Injury Model: Preliminary Results**

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Aim: To investigate neuroprotective effects of epidural electrical stimulation in rat spinal cord injury model.

Method: Thirty Wistar albino rats were divided randomly into three equal groups: Group 1: control-sham, Group 2: trauma, Group 3: trauma+treatment groups. In all groups, total T10-L2 laminectomy was performed. The spinal cord trauma was made by in Group 2 and group 3. The pulsed current electrical stimulation was given to group 3. Anode and cathode electrode with diameter of 2-3 mm was

implanted in the epidural space over the dorsal column at level T10 and L2. The connection side of the electrode were placed outside of the body through the cutaneous. The pulsed current electrical stimulation (5mV, pulse duration 0,1 msec, Frekans 40 Hz, 1-2 mA) was given to spinal cord daily for 15 days by Functional Electrical Stimulation device. Functional recovery of the hind limbs was assessed by the Basso, Beattie, and Bresnahan (BBB) locomotor scale. All animals were sacrificed and sent histology laboratory at 15th day.

Results: Electrical stimulation treated group (group 3) show increased functional recovery and clinical outcome when compared group 2.

Conclusion: Electrical stimulation provided that resulting in increased muscle force due to better muscle reinnervation. This study demonstrated that electrical stimulation increased clinical outcome in spinal cord injury when it was started early phase of injury. This results are preliminary results of study.

Keywords: Spinal cord, Injury, Electrical stimulation

EP-0252 [Spine and Peripheral Nerve » Basic Science]**Demineralized Bone Matrix (DBM) as a Bone Void Filler in Lumbar Interbody Fusion: A Prospective Pilot Study of Simultaneous DBM and Autologous Bone Grafts**

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Background: Solid bone fusion is an essential process in spinal stabilization surgery. Recently, as minimally invasive spinal surgeries have developed, a need of artificial bone substitutes such as demineralized bone matrix (DBM), has arisen. We investigated in vivo bone growth rate of DBM as a bone void filler compared to autologous bone grafts.

Method: From 2014 to 2015, 20 patients with spinal stenosis were included. A posterior lumbar interbody fusion using two cages and pedicle screw fixation was performed, and each cage was packed with autologous local bone or DBM. Clinical outcomes were assessed using the NRS and the Oswestry Disability Index (ODI), preoperatively and postoperatively. CT was performed 1 year after surgery and bone growth of each cage were analyzed by ImageJ software.

Results: Eighteen patients completed 1 year of follow-up, and the mean age was 56.4. Eleven patients had single level and 7 had two-level surgery. The mean back pain and leg pain NRS improved significantly. The mean ODI score also improved. Every cage packed with local autologous bone graft or DBM showed bone bridge formation. On the quantitative analysis of bone growth, autologous bone grafts showed significantly higher bone growth compared to DBM on both coronal and sagittal images ($p < 0.05$). Osteoporotic patients showed less bone growth on sagittal images.

Conclusion: Though DBM alone can induce favorable bone bridging in lumbar interbody fusion, it is still inferior to autologous bone grafts. Therefore, DBM is recommended as a bone graft extender rather than bone void filler, particularly in patients with osteoporosis.

Keywords: Lumbar interbody fusion, Demineralized bone matrix (DBM), Local autologous bone grafts, Bone void filler, Graft extender, Bone bridge

EP-0253 [Spine and Peripheral Nerve » Basic Science]

What is the Effect of Reinsertion of the Pedicle Screw Through the Same Trajectory on Pullout Strength?

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Aim: To investigate the pullout strength of the reinserted pedicle screw through the same trajectory.

Method: Fifty freshly frozen lamb L5 vertebrae were divided into the following 5 groups: group 1, insertion of a 5-mm pedicle screw; group 2, insertion of a 5-mm pedicle screw followed by the removal and reinsertion of the same screw after control; group 3, insertion of a 5-mm pedicle screw followed by the removal and reinsertion of a 5.5-mm screw after control; group 4, insertion of a 5.5-mm pedicle screw; and group 5, insertion of a 5.5-mm pedicle screw followed by the removal and reinsertion of the same screw after control. Pedicle screws were inserted into the right pedicles, and axial pullout testing was performed at a rate of 5 mm/min. All data were recorded.

Results: A load-displacement curve was used to obtain the peak value of the pullout strength for all specimens. The mean pullout strengths of the groups were 1086.22 N for group 1, 1043.32 N for group 2, 1039.18 N for group 3, 1199.10 N for group 4, and 1131.68 N for group 5. There was no significant difference between all groups ($p > 0.05$).

Conclusion: Perioperative reinsertion of the same screw or of the a pedicle screw that is 0.5 larger in diameter through the same trajectory after the control of the screw trajectory did not affect the pullout strength of the screw

Keywords: Freehand technique, Pedicle screw, Pullout, Reinsertion, Same trajectory

EP-0254 [Spine and Peripheral Nerve » Basic Science]

In Vitro Effect of Iodixanol on Human Intervertebral Disc Cells

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The diagnostics of discogenic low back pain may employ also radioopaque contrast agents, such as iodixanol, which may cause cytotoxicity to intervertebral disc cells after intradiscal injections. The result is initiation or acceleration of the degeneration process. The study aim was to evaluate the effect of iodixanol on human intervertebral disc cells in vitro. From human lumbar intervertebral disc fragments, annulus fibrosus and nucleus pulposus cells were isolated, cultured on the microtitre plates and exposed to various concentrations of iodixanol. Saline was used as a control. Three

different dilutions (undiluted, 1:2 and 1:4) of iodixanol were tested. After 6, 24 and 48 hours, viability was determined. A time and dose depended response to iodixanol exposure was observed. The nucleus pulposus cells were more susceptible than annulus fibrosus cells to its toxic effects. Iodixanol was cytotoxic in all three tested concentrations with the cell survival of 0%, 8% and 14%, respectively. Necrosis, rather than apoptosis, was the main reason for such devastating effects. The cytotoxic effects were observed in a dose- and time-dependent manner. According to our study, concentrated iodixanol should be avoided due to its high toxicity to the intervertebral disc cells. The 1:4 dilution was least toxic and may be thus recommended for the intradiscal diagnostics. However, high dilutions are questionable due to loss of resolution yield. It is assumed that the genesis of disc degeneration might be contributed also by the toxic effects of the contrast agents used, culminating to progressive tissue damage after the diagnostic measures.

Keywords: Intervertebral disc, Iodixanol, Human, Intervertebral disc cells, Toxicology

EP-0255 [Spine and Peripheral Nerve » Basic Science]

Biomechanical Changes After Cervical Spinal Arthroplasty in Perspectives of Range of Motion, Disc Pressure, and Facet Strain

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Anterior cervical discectomy and fusion (ACDF) has been a widely accepted procedure for treatment of cervical disc diseases. However, several reports about post-fusion exacerbation of adjacent segments gave rise to development of motion preserving prosthesis. There has been a recent vogue for the use of artificial disc prostheses to decrease the risk of accelerated degenerative disease at adjacent levels. The short-term results of artificial disc replacements (ADRs) have been encouraging, but the long-term justification for using this new technology hinges on whether the incidence of adjacent segment disease decreases. It will also be necessary to demonstrate that movement at the operated levels is maintained and the incidence of device failure is low. The author present the retrospective analysis comparing cervical ADR with ACDF using stand-alone cage. The segmental range of motion of operated level, rostral adjacent level, and caudal adjacent level were measured from plain dynamic radiographs using Cobb angle. We found that cervical arthroplasty showed favorable motion preservation at the operated level. Radiologically, the ACDF group showed more increase of adjacent segment motion 1 year after surgery, which implies that cervical arthroplasty may have advantages in preventing adjacent segmental diseases compared with ACDF. The radiological, biomechanical and clinical evidence for adjacent segment disease, and the rationale for using cervical ADR will be reviewed, along with the author's clinical experiences.

Keywords: Artificial disc replacement (ADR), Cervical arthroplasty, Biomechanical changes, Range of motion, Disc pressure, Facet strain

EP-0256 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Dynamic Lumbar Stabilization Versus Minimally Invasive Lumbar Arthrodesis: Experience of the Military Area Hospital of São Paulo - HMASP**

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Military population are under high biomechanical demand and need to be promptly ready to service as soon as possible. Minimally invasive spine surgery (MISS) has been used increasingly due to its lower aggression to tissues and faster patient recovery. Dynamic arthrodesis is an important spine surgery technique for young patients. There are, however, scarce literature reports about the performance of patients undergoing this type of surgery. The goal of this study is describe clinical and epidemiological aspects, compare functional and quality of life outcomes of patients submitted to two different surgical approaches of the lumbar spine. This is a descriptive, retrospective and comparative study with medical records of patients submitted to spinal surgery at HMASP from January 2014 to March 2016. Patients submitted to MISS and lumbar dynamic stabilization were compared. Clinical improvement (VAS) and improvement in the quality of life (SF-36) were described and compared with the treatments proposed. The sample of patients submitted to MISS had 29 patients, 12 males and 17 females; With ages varying from 19 to 76 years. These were compared to a group undergoing dynamic stabilization of the lumbar spine which had 31 patients, 25 males and 6 females. The age of these patients ranged from 19 to 56 years and mean of 38.8 years. Among these patients, the most common diagnosis was lombociatalgia. In this comparative study, we did not observe a statistically significant difference in relation to the quality of life and pain improvement of the patients submitted to both surgical interventions.

Keywords: Lumbar minimally invasive spine surgery, Brazilian army, Lumbar spine, Military, Dynamic lumbar stabilization

EP-0257 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Anterior Cervical Approach in Degenerative, Traumatic, Tumoral and Infection Disease**

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We present a series of 126 patients that required cervical spine surgery in which an anterior cervical approach (ACA) was chosen. Our intention is to show actual applications of ACA for different pathologies of cervical spine. We present the results (most of them good to excellent) as well as the most common complications in our practice. Patients undergoing ACA in a 20-year period (1996-2017) were included in this paper. Etiologies included: 89 patients with degenerative, 31 traumatic, 5 tumoral and 1 with infection disease - 58 women and 68 men. The average age was 55.6 years. All the

patients had cervical pain, nerve root pain in a dermatome pattern and most had loss of strength in upper extremities. Patients were evaluated with MRI and CT. They were treated with anterior cervical approach on the right side. Most common areas of surgery were C4-C5, C5-C6. The outcome results were collected at a range from 2 months to 20 years. Over 70 patients have an over 10-year follow up. Average hospitalization ranged from 24 to 48 hours. The results were defined according to Odom's scale for degenerative disease as Excellent 89%, Good 7%, Regular 3% and Poor 1% and ASIA scale for traumatic. Adverse events were: Dysphagia 20%, dysphonia 4%, wound infection 2.4%, esophageal injury 1.6%, spinal cord injury 1.6% and bone graft extrusion 0.8%. Most of the adverse events were transitory with eventual full recovery. There were two fatalities due to complications including esophageal perforation and post surgical wound infection.

Keywords: Spine, Anterior cervical approach, Degenerative, Traumatic, Tumoral, Infection

EP-0258 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**360° Stabilization in Cervical Spine**

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Aim: To estimate the efficacy of surgical treatment of patients with cervical spine traumatic injury.

Method: We operated 66 patients with traumatic injury of cervical spine, 13 patients underwent 180° stabilization, 53 patients underwent 360° stabilization. Surgical indications were: instability of three vertebral columns, spinal canal deformity and neurological deficit. During the surgery for optimal therapeutic effect (neural structures decompression and spinal fusion) we changed patients position twice in 360° in general. Firstly, in patient's abdominal position we made posterior decompression by laminectomy (or hemilaminectomy). After that, we change patient's position intraoperatively on his spine, and secondly we made a corporectomy with interbody Mesh stabilization (in case of vertebral body smash) and anterior stabilization by Medtronic Atlantis plate.

Results: During the operation, all patients had achieved fusion, in the postoperative period patients were activated the next day after surgery (except for patients with severe comorbidities and neurological deficit), completely regressed pain and gradually restored rotational motion of the cervical spine from 180° to 120°. Postoperatively in 6 months, all patients underwent spiral CT and confirmed fracture healing and the complete stability of the damaged segment.

Conclusion: Thus, we believe that in case of difficult cervical spine injuries the approach must be safe for fracture healing of injured segment. 360° stabilization has such possibilities and helps us to achieve optimal therapeutic effect and allows quickly adept patients to their usual social life.

Keywords: Cervical spina trauma, 360 degrees stabilisation, Fusion

EP-0259 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Microscopic Unilateral Approach for Bilateral Decompression of Lumbar Spinal Stenosis**

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Background: This study a consecutive series of patients who had spinal stenosis surgery was performed by a single surgeon who used a microscopic approach with taylor retractors, brain spatula; The objective was to assess the efficiency of unilateral-approach bilateral decompression and utilization of these tools in this surgery.

Method: Thirty three patients with spinal stenosis underwent bilateral decompression; surgery was performed via a Microscopic Unilateral Approach for Bilateral Decompression (MUAfBD). Preoperative and postoperative MR imaging was also performed.

Results: One levels were surgically decompressed. Average age was 61.25 (52-82); 75,7% (25) were women, and 24,2% (8) were men. The most frequent symptoms were pain (93,9%) and neurological claudication (90,9%). In all patients the anteroposterior diameter of the spinal canal was less than 10.5 mm. Patients had decreased quality of life, which is a principal reason for surgery. In our study, short-term complete recovery of symptoms was observed in all of the cases. Surgery is directed at nerve root decompression and partial resection of facet complete removal of ligamentum flavum. This microsurgical approach preserves the spinous processes, the interspinous ligaments and the integrity of the physiological muscular attachment of the opposite side.

Conclusion: This technique is an effective method for spinal stenosis. Taylor retractors and brain spatula can be called with a simple instrument that surgery can be performed. The overall idea of this approach was to reduce the surgical trauma and to avoid surgically induced instability as much as possible.

Keywords: Microscopic, Unilateral approach, Lumbar spinal stenosis

EP-0260 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Minimal Invasive Surgery in Lumbar Canal Stenosis**

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Minimal invasive surgery in lumbar canal stenosis including lumbar interbody fusion (TLIF and OLIF) is now being used in our institute prince Hamza hospital/neurosurgery department. With this technique we achieved all the advantages of minimal invasive surgery including avoidance of unnecessary muscle dissection and tissue destruction and it gave the patient early ambulation, short hospitalization, early return back to work and less use of antibiotics and pain killers comparing with open technique and as a result the cost of the treatment was reduced.

Keywords: Minimal invasive, Tlif, Olif, Lumbar canal stenosis

EP-0261 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Superiority of Partial Selective Neuroectomy to Microvascular Decompression in Trigeminal Neuralgia**

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Background: Trigeminal Neuralgia (TN) is one-sided, usually momentary sharp and paroxysmal pain in the distribution area of one or more branches of the trigeminal nerve. While it's more common in women, neurological examination is usually normal.

Method: 33 patients operated in our clinic between January 2013-January 2017 with TN diagnosis were included in this study. All patients received medical and certain local surgery treatments. Microvascular decompression (MVD), teflon (GROUP 1) was applied to 17 patients and microvascular decompression to trigeminal nerve, teflon application and partial selective neuroectomy (GROUP 2) was applied to 16 patients.

Results: 15 out of 33 patients were male, 18 were female between the ages 32 and 76, with an average of 51,2. Vascular pressure to trigeminal nerve was determined in 29 of these patients. 75,9% (22 patients) of the pressuring structures were SSA, 10,3% (3 patients) were AICA, 13,8% (4 patients) were superior petrosal vein. MVD had been applied to two patients at external clinics yet, they applied to us as their complaints weren't cured. It was determined that during surgery adequate microvascular decompression was performed and teflon was in place. However, since 2 of these patients' complaints continued, partial selective neuroectomy was performed in addition to the surgical procedure. The medical treatments of post-operation patients were completed approximately within 1 month. In approximately 2-year post-operation follow ups, it was determined that patients were leading a pain-free life.

Conclusion: It was determined by the long-term follow of group 2 patients had a better quality of life than group 1 patients. Procedure applied in our clinic is microvascular decompression, teflon, partial selective neuroectomy.

Keywords: Trigeminal neuralgia, Microvascular decompression, Partial selective neuroectomy, Teflon

EP-0262 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Microendoscopic Anterior Cervical Foraminotomy: A Preliminary Series of 76 Cases**

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Background: The microendoscopic anterior cervical foraminotomy technique can potentially preserve the functional cervical motion segment. This study aims to evaluate the clinical outcome of the technique in patients with unilateral cervical radiculopathy.

Method: In the period between August 2009 and March 2015, 76 consecutive patients were included in this study. Cervical magnetic resonance imaging (MRI), computed tomography (CT) scan and

plain X-rays were performed for all patients and then repeated postoperatively. Clinical and functional outcomes were assessed using Visual Analogue Scale (VAS) and Odom's criteria.

Results: According to VAS score, there was an improvement in neck pain from 6.4 (range: 5-10) to 1.5 (1-5) and in arm pain from 7.2 (range: 6-10) to 1.2 (0-4) at final follow-up ($P < 0.05$). Functional outcomes according to Odom's criteria were excellent in 59 (78%) cases, good in 10 (13%), fair in 6 (8%), and poor in 1 (1%) case. Success of surgery was considered to be achieved in 91% (excellent+good) of cases. Mean operating time was 81 minutes, and mean intraoperative blood loss was 21 ml. Most significant complications included a dural tear in 1 case, transient postoperative dysesthesia in 6 cases, excess bony work resulting in unintended uncinectomy in 3 cases and fracture of transverse process in 1 case, unintended near total discectomy in 2 cases, infective discitis in 1 case, and persistent radicular pain due to incomplete osteophyte removal in one case.

Conclusion: The reported technique yields excellent results in selected cases, patients typically experience immediate postoperative neck mobility.

Keywords: Endoscopic, Minimally invasive, Anterior cervical, Foraminotomy

EP-0263 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Anterior Screw Plate Fixation for Odontoid Fractures: A New Technique

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Certain unstable odontoid fractures (anterior oblique fracture, displaced distal fragment, disrupted alar ligament) are usually offered posterior C1-C2 fixation by Goel-Harms technique. Injury to the vertebral artery, venous plexus and the C2 root ganglion remain the possible complications of posterior atlantoaxial fixation. Prone positioning for posterior surgery in an unstable odontoid fracture is an additional risk factor. Fracture manipulation, reduction and repositioning is feasible along with fixation in compression mode with a VSP plate and screws. Additional instability of the atlantoaxial joints, if present, can be treated simultaneously with anterior transarticular screws. Anterior trans articular screws are biomechanically equal to posterior transarticular screws in terms of rigidity and fusion rates and avoids the vertebral artery altogether. As all fixation is under vision and X-ray control, expensive navigation becomes redundant. The vertebral artery is not at risk and neither the paravertebral venous plexus or C2 root at any risk of injury. Since February 2011 - January 2017 45 patients with unstable odontoid fractures have been offered this procedure. Five elderly patients (70 yrs and 76 yrs) complained of dysphagia for 2-3 days after surgery, 4 patients (including the ones with dysphagia) had mild hypoglossal weakness which recovered in a week. Neck pain persisted in 9 patients for 4 weeks which responded to analgesics. Long-term follow-up imaging has been at 3 years in 8 patients, without implant failure and 100% bone fusion.

Keywords: Odontoid fracture, Atlantoaxial fusion, Atlantoaxial fixation, Screw fixation of odontoid fracture

EP-0264 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Instrumentation Through Interrupted Trajectory in Complex Cervical Spine Cases

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Background: Surgical challenges in complex spine cases include yet not limited to; limited exposure, decompression near vital or neural structures, decompression at a blind angle, and difficult trajectories for instrumentation. Displaced bone pieces across the desired trajectory is a major challenge when it is the only available trajectory to use. The type and extent of image guided-surgery for spine disorders still lacks evidencebased medicine proof. It is up to the health care providers sound judgement and expertise to do what is needed for the patient. The use of intraoperative CT-quality Oarm, and neuronavigation are still tested as aiding tools in such operative modalities.

Method: We selected 2 cervical spine cases that were operated upon during the years 2009-2016 in our institute by the first author to be included in this study. Both represent complex traumatic spinal fractures. Both of them a major technical challenge in the trajectory jeopardizing the safety of instrumentation. In both cases the Medtronic O-arm and Medtronic StealthStation were used as intraoperative mapping tools.

Results: Intraoperative navigation tools were so useful in securing neural and vascular tissue safety, surpassing the trajectory difficulty, together with tough bony purchases of the hardware from the first and only trial of application when needed. Intraoperative CT taken by the o-arm was a useful confirmatory intraoperative test of proper hardware placement.

Conclusion: The intraoperative use of the O-arm and stealthStation is very useful in this modality of spine surgeries.

Keywords: Complex spine, Navigation, O-arm

EP-0265 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Lumbar Micro-Endoscopic Discectomy: Surgical Technique and Nuances

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Background: Lumbar microendoscopic discectomy (MED) is a minimally invasive transmuscular approach that combines standard lumbar microsurgical techniques with endoscopy. The procedure has many advantages over other minimally invasive lumbar discectomy techniques. Nonetheless, MED is known to have a steep learning curve that limits its utilization. Our aim is to describe the surgical technique of MED and elaborate on nuances that may help avoiding the pitfalls encountered during the learning curve of MED.

Method: Operative charts and videos of patients undergoing MED were retrieved from a database maintained by our group and reviewed so that a description of the surgical technique could be formulated.

Results: The surgical technique and nuances that were acquired during the learning curve of MED are described.

Conclusion: The surgical technique of MED is essentially similar to conventional microdiscectomy. Some modifications are however necessary to overcome the steep learning curve of MED. Should these nuances be performed, the surgical team will be able to circumvent many difficulties encountered during the initial operative experience.

Keywords: Discectomy, Endoscopic, Lumbar, Microendoscopic, Neuroendoscopy, Spine

EP-0266 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Minimally Invasive e-TLIF as a Novel Option to Management of Degenerative Lumbar Spondylolisthesis. A Study with 18 Months of Follow-Up

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Background: TLIF technique showed many advantages to achieve spine realignment, decompression and fusion, however minimally invasive techniques are coming to avoid muscle injury, allowing short hospitalization and quickly return to daily activities. Berbeo et al. introduced The Extreme lateral Transforaminal Interbody Fusion (e-TLIF) which preserving a superior and medial facet, show us an excellent corridor to perform the discectomy and fusion as well as protect a nerve root about injuries while working at disc space.

Method: We present 10 patients (6 man, 4 women), from ages 41-81 y/o, with L4-5 degenerative spondylolisthesis underwent MIS e-TLIF. We analyze the surgical time, blood loss, time to discharge and return to daily activities, as well as we measured a VAS and Oswestry disability index preoperatively, 6 weeks, 3, 6, 12 and 18 months pop. All the patients was supplemented with percutaneous transpedicular screws.

Results: VAS preop was mean 7 and POP 4 and 18 months pop was mean 1. The Oswestry was mean 52 preop and decrease to 11 on 18 months pop. Surgical time was mean 74 min. Blood loss was 36cc mean, time to discharge 23 hours and return to daily activities 12 days. A radiologic solid fusion was seen in 85% of patients.

Conclusion: e-TLIF is an interesting option to treat a degenerative lumbar spondylolisthesis preserving a superior facet, achieving indirect decompression and protecting the nerve root. This procedure allow the patients return quickly to daily activities. How ever we need more experience to make a final conclusions.

Keywords: E-tlif, Lumbar, Disc, Degenerative, Minimally invasive

EP-0267 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Efficiency of Endoscopic Transforaminal Microdiscectomy (ETMDE) in Comparison to Microsurgical Discectomy (MDE) in Lumbar Disc Herniation Treatment

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Aim: To compare efficiency of ETMDE and MDE for the treatment of lumbar disc herniation.

Method: 300 patients with LDG in age from 18 to 74 years old participated in our research. ETMDE was executed in the first group (150 patients), MDE was performed in the second group (150 patients). Both groups were identical in duration of anamnesis, severity of pain syndrome, localization and size of herniation.

Results: Excellent and good results have been achieved in 89% patients of the first group and in 87% patients of the second group. Deterioration of the patient condition has occurred in 5% patients of the first group and in 11% patients of the second group. Reoperation rate was 6% in the first group and 2% in the second group. ETMDE was more effective in the cases of the medial and paramedial herniations without the signs of sequester migration. MDE was more effective in the cases of sequester migration in the caudal or cranial direction more than 1 cm. Average duration of stay in hospital after ETMDE – 20.7±5.3 hour, and after MDE – 4.6±2.5 days. Duration of rehabilitation period after ETMDE – 25.3±7.8 days, and after MDE – 85.5±12.6 days.

Conclusion: ETMDE is the effective minimally invasive method of lumbar disc herniation treatment. Efficiency of ETMDE is not lower than efficiency of MDE. Terms of stay in hospital and rehabilitation period are significantly lower in the group of ETMDE in comparison to the group of MDE.

Keywords: Transforaminal microdiscectomy, Microsurgical discectomy, Lumbar disc herniation

EP-0268 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Atlantoaxial Joint Synovial Cyst: A Case Report

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Synovial cysts (SCs) are well-recognized entities arising at various spinal sites, but those occurring at the C1-C2 level are uncommon. In this report we describe the case of a 53-year-old female patient with an atlanto-axial snovial cyst revealed by slowly progressive cervical cord symptoms. The patient was treated by the posterolateral route with good clinical and radiological outcome. The hisological examination confirmed the diagnosis of synovial cyst. We discuss the therapeutic options for this uncommon cervical entity through a literature review.

Keywords: Synovial cysts, Atlantoaxial joint, Dens, Posterolateral decompression

EP-0269 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Our Policy Regarding the Diagnosis and Management of Complicated Lumbar Disc Hernias (Failed Back Surgery Syndrome)

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Background: Low back pain caused by degenerative disc diseases of the spine is one of the most frequently met reasons for consulting a physician. Given the high variability of symptoms, literature data shows the prevalence of low back pain to be situated somewhere between 12 and 40% in adults.

Method: The purpose of our study is to facilitate a better understanding of how Failed Back Surgery Syndrome (FBSS) appears in patients operated for lumbar disc hernias (LDH) and to improve the results of the surgical management in these patients. We evaluated and compared all the surgical approaches available for LDH (non-endoscopic) in a cohort of 150 patients operated in 4 neurosurgical centers in Romania and followed over a period of 6 years, presenting at the same time complication occurrence rates for each approach and FBSS generating factors, thus attempting to create a standard rationale for the surgical treatment of LDH.

Results: Short term results should improve the quality of life for patients with LDH while long term results should decrease the financial pressure generated by patients with FBSS on the medical system in Romania.

Conclusion: Through its financial and socio-economic components, LDH represent a public health problem in Romania. Both prevention and early diagnosis policies should be installed in order to reduce patient suffering and to decrease the costs of treatment of FBSS. Surgical interventions should be carefully weighed and considered to be only a tailored, last resort gesture for carefully selected patients.

Keywords: Failed back surgery syndrome, Management algorithm, Surgical technique, Complications, Neurosurgery

EP-0270 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Clinical Result of Utilization of Image-Guided and Navigation-Assisted Method for Percutaneous Endoscopic Lumbar Disc Herniation Surgery

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Background: According to researchers, degenerative disc diseases is XXI century pandemic. Lumbosacral disc herniations are found in 61% of patients with spinal degenerative diseases. Image

guidance technology and minimal access technique advancements push the frontiers of minimally invasive spine surgery. While traditional intraoperative imaging remains used, newer platforms, like 3D-fluoroscopy, cone-beam CT, and intraoperative CT/MRI enabled safer, accurate instrumentation placement with less surgeon radiation exposure. This work reviews a private experience of image guided system uses in lumbar spine endoscopic procedure.

Method: Authors used the O-ARM and S7 navigation system for percutaneous endoscopic lumbar disc herniation removal (PELD). This study included 65 patients who underwent transforaminal procedure for migrated disk herniation. Image-guided navigation utilized in 9 cases. Pre- and postoperated examination included visual analogue scale (VAS) Oswestry Disability Index (ODI), radiological workup and operation time.

Results: Postoperative mean ODI decreased from 77,27±7,1% to 16±1,6%. All patient noted improved pain status. Mean VAS score for back pain improved from 9.27±0.27 to 1.87±0,93 and leg pain from 8.0±0.67 до 1.62±0,98. Analysis of radiological work up confirms advantages of navigated PELD versus non navigated. Common radiation dose was 1.5±0.5 mSv for patients who undergone navigated procedure versus 5,3±0.7 mSv in non navigated group. The mean operation time was not deferent in both groups.

Conclusion: Intraoperative cone-beam CT combined with navigation system in PELD decreases common radiation dose versus traditional fluoroscopy. Improvement of visualisation and control of instruments increase quantity "best result" of surgery via improving of quality of nerve structures decompression.

Keywords: Degenerative disc diseases, Image guidance technology, Minimally invasive spine surgery, Percutaneous endoscopic lumbar disc herniation removal (PELD)

EP-0271 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Modified S1 Transpedicular Screw Entry Point in Closed Posterior Superior Iliac Spine

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Background: Posterior spinal fusion at the lumbo-sacral junction remains challenging because this surgery is associated with a high rate of complications, such as pseudarthrosis, instrumentation failure, pull-out, incorrect placement etc. In cases in which there is a closed posterior superior iliac spine (PSIS), placement of pedicle screws into S1 is difficult. In this study, we describe a novel S1 screw entry point and screw direction. With that projection, we can insert safe and strong S1 corpro-pedicular screw in case of closed posterior iliac spine.

Method: In this anatomic study, five formalin fixed cadavers were dissected to describe S1 entry point, twenty adult dry sacra were used to measure S1 pedicle morphology. All sacral parameters were measured bilaterally using calipers accurate to 0.1mm and a goniometer accurate to 1°. The screws were inserted into S1, in formalin fixed cadavers, were shown and confirmed by fluoroscopy.

Spinal computerised tomography images crossing S1 pedicle level were also be analysed and measured by an radiologist.

Results: In this study, we described a new S1 screw direction method. The starting point for transpedicular S1 screw introduction is, in comparison to classical method, more cranial and superiolateral of S1 superior facet, and the direction of screw is more caudal. Therefore, one can insert the S1 screw with the present method regardless of limiting posterior superior iliac spine.

Conclusion: Thus, this new surgical technique may be used successfully and safely in cases of PSIS and revision of S1 screw.

Keywords: Sacrum, screw, Surgical technique, Anatomy, Iliac

EP-0272 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Chiari Malformation I: Is It a Nature's Protective 'Air-Bag'?

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Background: Understanding that atlantoaxial instability is the cause of Chiari malformation, the author treated 120 patients using atlantoaxial stabilization.

Method: Cases of CM treated using atlantoaxial fixation during the period from January 2010 to June 2015 were reviewed and analyzed. Surgery was aimed at segmental arthrodesis.

Results: The author treated 120 patients with CM in the defined study period. Eight patients had been treated earlier using foramen magnum decompression and duroplasty. According to the extent of their functional capabilities, patients were divided into 5 clinical grades. On the basis of the type of facet alignment and atlantoaxial instability, the patients were divided into 3 groups. Type I dislocation was anterior atlantoaxial instability wherein the facet of the atlas was dislocated anterior to the facet of the axis. Type II dislocation was posterior atlantoaxial instability wherein the facet of the atlas was dislocated posterior to the facet of the axis. Type III dislocation was the absence of demonstrable facet malalignment and was labeled as "central" atlantoaxial dislocation. All patients were treated with atlantoaxial plate and screw fixation using techniques described in 1994 and 2004. Foramen magnum decompression or syrinx manipulation was not performed in any patient.

Conclusion: On the basis of outcomes in this study, it appears that the pathogenesis of CM with or without associated basilar invagination and/or syringomyelia is primarily related to atlantoaxial instability. The data suggest that the surgical treatment in these cases should be directed toward atlantoaxial stabilization and segmental arthrodesis. Foramen magnum decompression is not necessary and maybe counter-effective.

Keywords: Chiari malformation, Atlantoaxial instability, Atlantoaxial fixation

EP-0273 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Cervical Microdiscectomy Surgical Technique: Anterior Approach vs Posterior Approach

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Aim: To implementate the interlaminar lateral approach for extraction of herniated discs in the cervical spine.

Method: 2012-2016 were operated 67 patients with cervical herniated discs. The main disease signs were: cervicgia and monoradiculopathy. 51 patients with medial localization of hernia were operated by anterior approach with herniated disc extraction and intervertebral cage implantation (PEEK material). 16 patients had lateral hernia placing. They were operated by posterior interlaminar cervical microdiscectomy. Anterior approach was made by standard method. The way of posterior interlaminar approach was such: paramedian skin incision (3cm), intermuscular approach to the rear side lateral angle bows on the affected side. After that we used highspeed drill for interlaminectomy (1cm), then – hernia extraction from under nerve root.

Results: In all cases we managed to achieve the regress of radicular and cervicgia syndroms. No complications were fixed during performance of both surgical approaches. The average time in the surgery between the two methods didn't differ significantly and lasted about 64±12 minutes. All patients were verticalized and activated in 3-4 hours after surgery inside the clinic.

Conclusion: The posterior interlaminar approach is effective method in case of lateral herniations, especially sequestered herniations. It intends the preservation of own intervertebral disc and reduces the general price of surgery due to no necessity to use the implants-prosthesis of the last one. We suppose that posterior cervical microdiscectomy of lateral, sequestered intervertebral discs herniations in cervical spine must become a standard method of treatment.

Keywords: Intervertebral discs herniation, Cervical microdiscectomy, Surgical treatment

EP-0274 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Posterior Occipital Condyle Screw Trajectories

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Background: Craniocervical instability requiring instrumented fusions may occur in multiple pathologies such as Rheumatoid arthritis, postoperative iatrogenic, trauma, or infection. For patients with prior suboccipital craniectomies, craniocervical fixation is challenging. Anatomical feasibility on condylar screws as a craniocervical fixation point has been previously demonstrated. Direct condylar screws have several biomechanical advantages such as a shorter moment arm and longer screws than midline occipital screws provide. We present a cadaveric anatomical review of several occipital condylar screw techniques including their entry point, trajectory, and proximity to important surround structures.

Method: This was a cadaveric study comparing 3 entry points and trajectories for occipital condyle screw insertion as previously described in the literature. A standard posterior midline approach was performed exposing the craniocervical junction. Entry points for condyle screws were marked on the posterior condylar surface. The proximity of the entry points to the vertebral artery, posterior condylar emissary vein, and sagittal relation to hypoglossal canal were measured.

Results: We intend to show how the various occipital condyle screw techniques compare in their extent of dissection required and proximity of entry points and trajectories to critical structures. Also, in the event of fracture of entry point cortex or other need to reposition the screw, we will identify a safe location for salvage screw placement.

Conclusion: We will show the important craniocervical anatomy and suggest which technique for condyle screw insertion would be appropriate for a trainee to start with. Biomechanical analysis of different screw constructs would be needed to also compare techniques.

Keywords: Occipital condyle, Craniocervical junction, Spine, Craniocervical

EP-0275 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Posterior Cervical Foraminotomy Using Newly Designed Large Bore Endoscope. (8.4 mm of Outer Diameter and 5.7 mm of Working Channel)

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Background: Endoscopic spinal surgeries have been developed and evolved for the past few decades. Endoscopic cervical posterior foraminotomy (ECPF) has been done by experienced surgeons but due to the limitations of the endoscopic instruments themselves, it has not become popular as it is for the lumbar endoscopic surgeries. With the newly designed endoscope (H View stenoscope) having the outer diameter of 8.4mm and inner diameter of 5.7 mm, virtually most instruments that are used for conventional open surgeries could be manufactured and could be accommodated by the large bore endoscope when the shafts are built long enough to pass through the endoscope.

Method: From November 2016 to February 2017, 21 patients underwent ECPF using H View Stenoscope system at Cheonan Woori Hospital. Male to female ratio was 13 to 8. Mean age was 50.5.

Results: All of the patients were relieved of pain immediately after the surgery except for three. Two patients suffered from transient aggravation of pain which fully subsided in one or two days. One patient had epidural hematoma resulting in monoparesis Gr IV. Most patients discharged in one or two days after the surgery. ECPF is a versatile operative technique avoiding large scar and the need for cages or artificial discs.

Conclusion: With the aid of the large bore endoscope, ECPF could be done with more ease and confidence.

Keywords: Stenoscope, PSCD, Cervical foraminotomy, Discectomy

EP-0276 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Clinical Results of Endoscopic Microdiscectomy in Intervertebral Disc Hernias of Lumbar Spine Division

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Aim: To investigate the clinical results of endoscopic micro discectomy (EMD) in the treatment of herniated discs in the lumbar spine division.

Method: EMD was made to 147 patients with herniated lumbar intervertebral discs 98 (66.7%) patients were made EMD by the method of Destandau, and by portal technology EasyGo to 49 patients (33.3%) with the help of endoscopic tools of Karl Storz, Germany. The diagnosis was based on anamnesis, clinical and neurological data, MRI, CT and CT myelography. Pain radicular syndrome was observed in all patients, movement disorders were observed in 39 (26,5%), sensory loss in 82 (55.8 per cent), pelvic disorders in 1 patient. The position of the patient during surgery is "Mekka-position".

Results: The results of treatment are divided into near - up to 3 months and distant - more than 6 months. Analysis of the treatment results were carried by scale MacNab, pain syndrome by visual analogue scale. Analysis of remote results of treatment after 6 months showed excellent results in 105 (71,4%), good in 27 (18,4%), satisfactory in 9 (6,1%), unsatisfactory results in 6 (4.1%) cases, respectively. Unsatisfactory result in the form of recurrent hernias with reoperation was observed in 5(83,3%) patients, spondylodiscitis in the postoperative period occurred in 1 (0,69%) patient.

Conclusion: Analysis of treatment results showed that portal endoscopic methods are modern progressive highly effective and less traumatic methods of surgical treatment of herniated intervertebral discs of the lumbar spine division.

Keywords: Lumbar division, Endoscopic micro discectomy, By the method of Destandau J., and by portal technology EasyGo

EP-0277 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Flexible "Chip-on-the-Tip" Endoscopy for Surgical Treatment of Spinal Arachnoiditis and Arachnoid Cysts

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Background: The newest method of surgery for intrathecal adhesions is thecaloscopy – exploration of spinal subarachnoid space with ultra-thin 2.8-mm flexible "chip-on-the-tip" endoscope and endoscopic fenestration of scars and adhesions. The experience of this method for spinal arachnoiditis and arachnoid cysts in spine surgery is very limited. Goal of our study was to estimate effectiveness and safety of thecaloscopy for surgical treatment of spinal arachnoiditis and arachnoid cysts.

Method: 42 patients were operated using flexible "chip-on-the-tip" endoscope for spinal arachnoiditis and arachnoid cysts. In all patients visualization and endoscopic manipulations on subarachnoid space were successful. After revision of subarachnoid space in cranial and caudal directions CSF passage was estimated. Results of surgical treatment were evaluated with VAS of pain and numbness, Kurtzke scale and EuroQol scale.

Results: Clinical results of thecaloscopic surgeries were as follows: VAS of pain – 3.86 ± 2.75 , 2.5 ± 2.00 and 1.55 ± 1.48 ; VAS of numbness – 4.5 ± 2.51 , 3.81 ± 2.52 and 2.59 ± 2.22 ; Kurtzke scale – 1.38 ± 0.93 , 0.93 ± 0.67 and 0.595 ± 0.63 ; EuroQol scale – 0.513 ± 0.161 , 0.647 ± 0.148 and 0.738 ± 0.147 pre-operatively, 1 month and 12

months postoperatively, respectively ($p < 0.05$). Mean hospital stay was 8.02 days. Complications rate appeared to be 14.2% and included 1 CSF leak and 3 tempo-rary neurological deterioration.

Conclusion: Our study showed short-term and long-term effectiveness and safety of thecaloscopy for surgical treatment of spinal arachnopathies and arachnoid cysts. Flexible endoscopy for expanded arachnoiditis and cysts is less invasive than open surgery.

Keywords: Flexible endoscopy, Spinal arachnoid cyst, Chip on the tip endoscopy

EP-0278 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Epidural Adhesiolysis - A Long Term Review of the Method as a Means to Avoid Surgery

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Background: Both Endoscopic Epidural Adhesiolysis with drugs administration and plain Epidural injections are simple techniques for the treatment of persistent low back pain. With this comparative study we are trying to determine their longevity as a means to avoid surgery for selected patients.

Method: A total of 106 patients were treated with 134 procedures of epiduroscopy and Adhesiolysis, and another 36 patients were treated with 45 plain epidural injections. We have administered the VAS for pain, and the RMDQ for disability before the procedure, as well as 10 days and 6 months afterwards, and we compare the results for the two procedures.

Results: 13/106 patients (12,3%) of Gr. A and 5/36 patients of Gr. B (13,66%) - were operated before the 6 months follow-up. The patients of the subgroup A had a mean improvement on VAS of 3.32 at 10 days and 3,06 at 6 months and a mean improvement on RMDQ of 5.64.12 (10d) and 5.58 (6m), while patients of Subgroup B had a mean VAS improvement of 2.14 (10d) and 1.96 (6m) and 3.82 (10d) and 4.17 (6m) at RMDQ. Both results are statistically significant at 99% confidence level ($p < 0.01$). 5 Years later (35 patients lost to followup - 12 deceased) only a further 13 patients (14%) opted for surgery.

Conclusion: Endoscopic Epidural Adhesiolysis is a significantly more efficacious treatment than "plain" epidural injections. Thus, routine use of epidural adhesiolysis does provide options for delaying pain surgery, many times indefinitely in old and debilitated patients.

Keywords: Epidural, Adhesiolysis, Pain

EP-0279 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Treatment of Patients with Spinal Hydatid Cysts of the Spine

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Aim: To analyze patients with hydatid cysts of the spine in the thoracic and lumbar spine and examine the results of surgical treatment.

Method: The results of research and treatment of 26 patients with spinal hydatid cysts, conducted between 2010 and 2014gg. We studied the intensity of pain (VAS), a neurological condition (scale ASIA), and radiographic parameters characterizing the degree of deformation of the spinal column.

Results: A good result of treatment (group A) was observed in 17 (65.4%) patients. Okay (group B), the result of treatment was observed in 8 (30.8%) patients. In 1 (3.8%) cases received poor treatment outcome (group C). Analysis of neurological disorders in groups A and B on the lower extremities showed improvement (on average) to 1.46 ± 0.77 degree scale ASIA / IMSOP. Regression of neurological disorders occurred in all 25 patients. Marked decrease in pain (on average) to 4.35 ± 1.33 degrees in VAS. In groups A and C decrease in the angle of local kyphosis was (on average) $11.87^\circ \pm 7.12^\circ$. The best results were observed in the control panel ($9.45\% \pm 8.50\%$), than in PKDP ($7.55\% \pm 8.86\%$).

Conclusion: Operation posterolateral approach with removal of hydatid cysts of the spinal canal, resection of the affected vertebral hydatid cysts with robust internal stabilization reduces pain and reduces neurological disorders. In remote control studies have documented good results of treatment in 81.1% of patients with hydatid cysts of the spine.

Keywords: Spine hydatid cysts, Posterolateral approach, Lumbo-thoracic division

EP-0280 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Microsurgical Management of Thoracic Disc Herniations, Neurological and Anatomical Challenging Levels

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Symptomatic thoracic disc herniations (TDHs) are rare and it is usually accompanied by myelopathy and is indicated for surgical treatment. Surgical strategy for TDHs is challenging and it remains controversial. Several surgical approaches have been used to reach these anatomically challenging levels. In this study, we report a series of 32 symptomatic cases of TDH underwent microsurgical posterior transfacet decompression, discectomy and instrumentation. We evaluate and discuss the surgical outcomes of these cases. Outcomes and complications were assessed in this case series. We describe levels and types of herniated discs, pre/post-operative clinical status of patients according to Visual Analogue Scale (VAS), modified Japanese Orthopedic Association (JOA) score for thoracic myeloathy, operation time, intra-operative blood loss, surgical complications and post-operative sagittal alignment of the spine on radiographs of thoracic spine. We followed-up the patients for at least 12 months. All cases experienced symptoms improvement in comparison to their pre-operative status. None of patients required further surgery due to complications. Bony union achieved in all instrumented cases. The results of this study show that microsurgical posterior transfacet approach is a safe, efficient and convenient approach to TDHs in different subtypes without causing serious complications

Keywords: Microsurgical, Thoracic, Disc

EP-0281 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Insights into the Past and Future of Atlantoaxial Stabilization Techniques

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Over the past century atlantoaxial stabilization techniques have improved considerably. To our knowledge there has been a scarcity of articles published that focus specifically on the history of atlantoaxial stabilization. Examining the history of instrumentation allows us evaluate the impact of early influences on current modern stabilization techniques. It also provides inspiration to further develop the techniques and prevents repetition of mistakes. This paper intends to review the evolution of C1/C2 instrumentation techniques over time and provides insights into the future of the practices. We did an extensive literature search using pubmed, embase and google scholar using the following terms: medical history, atlantoaxial, C1/C2, stabilization, instrumentation, fusion, arthrodesis, grafting, neuroimaging, biomechanical testing, anatomical considerations, and future. Many different entry zones have been tested as well as different constructs from the initial attempts with the usage of silk threads to the usage of hooks and rod-wire techniques to the handling of bone grafts, which eventually led to the development of advanced screw-rod constructs that are currently in use. Much of this evolution is attributable to the advancements in neuroimaging, a wide range of new materials available and an improvement in biomechanical understanding in relation to anatomical structures.

Keywords: Atlantoaxial, Stabilization, Fixation, C1/C2, Instrumentation, History of surgery

EP-0282 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Conventional Lumbar Arthrodesis Versus Dynamic Stabilization of the Lumbar Spine: Experience of the Military Hospital of São Paulo Area - HMASP

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The goal is describe clinical-epidemiological aspects and to compare functional and quality of life outcomes of patients submitted to two types of different surgical interventions of the lumbar spine. This is a descriptive, retrospective and comparative study with the medical records of patients submitted to spinal surgery at the Hospital Militar de Área de São Paulo from January 2014 to March 2016. Patients presented to arthrodesis Of the lumbar spine and the dynamic stabilization of the lumbar spine for comparison between the groups. Clinical improvement (interpretation of the Visual Analog Pain Scale - VAS) and improvement in the quality of life (evaluated by the physical component of the SF-36 scale) were described and compared with the treatments Proposed. The sample had 38 patients, 13 males and 25 females and age ranging from 36

to 77 years submitted to conventional lumbar arthrodesis. These were compared to a group undergoing dynamic stabilization of the lumbar spine which had 31 patients, 25 males and 6 females. The age of these patients ranged from 19 to 56 years and mean of 38.8 years. Of these patients, the most common diagnosis was lumbago due to lumbar disc herniation. We observed a significant increase in the quality of life of patients submitted to dynamic stabilization of the lumbar spine.

Keywords: Conventional lumbar arthrodesis, Dynamic stabilization of the lumbar spine, Military

EP-0283 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Distraction and Repositioning of the Atlantoaxial Joints for Atlantoaxial Dislocation and Basilar Invagination from an Anterior Extrapharyngeal Approach: Novel Concept

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Reversal or reduction of cervicomedullary strain due to an invaginated and posteriorly angulated odontoid has become the aim of surgery in basilar invagination with or without associated atlantoaxial dislocation. Distraction of the atlanto-axial joints with cages for treatment of basilar invagination has become an option in recent years. The posterior approach described in literature has a small but definite risk of injury to the vertebral arteries, C2 root ganglion and can be associated with difficult haemorrhage from the suboccipital paravertebral venous plexus. The unilateral anterior retropharyngeal approach offers a safe and simple corridor to expose both the atlanto-axial joints for adequate manipulation to allow repositioning, distraction, bone grafting and fixation. Wedge shaped titanium cages impacted into the atlantoaxial joints effectively reduce the basilar invagination and reposition the atlas thereby correcting the atlantoaxial dislocation. Following reduction and repositioning the C1 lateral mass is fixed to the body of the axis with a screw plate construct. Since January 2014 to January 2017, 125 patients have undergone this procedure, case selection, the technique, and complications are presented.

Keywords: Basilar invagination, Atlantoaxial dislocation, Atlantoaxial fixation, Atlantoaxial distraction

EP-0284 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Lumbar Fusion in Ehlers-Danlos Syndrome: A Case Report and Review of the Literature

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Ehlers-Danlos syndrome (EDS) is a heterogeneous and hereditary collection of connective tissue disorders characterized by a defect in collagen synthesis (type I, III or IV). The patients present with varying degrees of skin hyperextensibility, joint hypermobility, and tissue fragility. Surgical treatment of EDS patients is complicated due to the extreme fragility of their vessels and tissues. The purpose

of this case report is to present the management of a 57-year-old woman with a clinical diagnosis of EDS that presented with degenerative disease at L4-5 and was submitted to lumbar fusion. The patient evolved unfavorably with progressive spinal deformity. The clinical course, decision-making process, and treatment are discussed in this case report.

Keywords: Lumbar fusion, Ehlers-Danlos syndrome, Review of the literature

EP-0285 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Retroperitoneal Extrapleural Approach for Corpectomy of the First Lumbar Vertebra: Technique and Outcome

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Background: The anterior approach to the lumbar spine with corpectomy is a recognized treatment option for unstable burst fractures, vertebral tumors and osteomyelitis. This study was done to evaluate the usefulness of retroperitoneal extrapleural approach through the twelfth rib in performing L1 corpectomy for management of different lumbar pathologies as well as its advantages and potential complications.

Method: This prospective study was carried out on consecutive 30 patients who had been operated for L1 corpectomy using the retroperitoneal extrapleural approach through the twelfth rib for different lumbar pathologies. This study was done in Alexandria Main University hospital over a period of five years starting from May 2009 to May 2014. There were 18 males and 12 females and their ages ranged from 18 to 65 years with mean age of 40.3 years. Radiological outcome was assessed by plain X-ray films and CT scan, and the neurological outcome by ASIA impairment scale. The mean follow-up period was 11.7 months (range, 3–23 months).

Results: There were no operative mortalities or vascular injuries in this series. The mean operation time was 220 min and the mean volume of blood loss was 600 ml. Back pain improved in all patients. During follow-up, no hardware failure or loss of correction was detected. Fusion was achieved in 90% of the cases requiring decompression.

Conclusion: The retroperitoneal extrapleural approach through the twelfth rib is a feasible approach to perform L1 corpectomy with minimal morbidity.

Keywords: Retroperitoneal extrapleural approach, Twelfth rib approach, Anterior approach, Lumbar spine, L1 corpectomy, Anterior instrumentation

EP-0286 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Posterior Fixation for Craniocervical Region Instability Using Screw-Rod Technique

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Surgery of the craniocervical region is one of the common surgeries in neurosurgery. One of the common pathologies encountered in the practice of neurosurgery in relation to craniocervical region is craniocervical instability. Many approaches have been invented to deal with such pathology, such as posterior fixation using screw-rod technique. The aim of this study was to assess the efficacy and safety of the posterior fixation using screw-rod system in patients with craniocervical region instability. 20 cases presented with craniocervical instability of different types and different causes were included in this study, admitted to Alexandria University hospital. All cases underwent a thorough clinical evaluation pre- and post-operatively. For myelopathic cases the mJOA score was used. In this study, 20 patients were operated upon with posterior fixation using screw-rod technique. The details of surgery were reviewed and so are the complications we faced for a period of 16 months. Postoperatively, neck pain had improved in all cases. 2 cases were mJOA grade III (10%), 1 case was mJOA grade II (5%), 11 cases were mJOA grade I (55%), and 6 cases were normal (30%). Solid fusion was achieved in all cases. Mean intraoperative blood loss was 385 ml. (range, 120-750) and mean operative time was 215.7 min. (range, 130-320). Complications include, CSF leak in one case (5%), neurological deficit in two cases (10%), wound infection in three cases (15%), and no postoperative complications in 14 cases (70%).

Keywords: Posterior fixation, Craniocervical region, Instability, Screw-rod technique, mJOA

EP-0287 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Craniocervical Fusion in Occipito-Atlanto-Axial Instability due to Rheumatoid Arthritis: Case Report

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The crano-vertebral junction is the most complex anatomic region of the columna vertebralis. The term crano-vertebral junction refers to the occipital bone, the foreman magnum, the atlas and axis vertebrae. Rheumatoid arthritis is one of the most common deforming diseases. Rheumatoid arthritis is inflammatory, chronic, relapsing arthritis that usually affects multiple joints. We present the case of posterior decompression and occipito-cervical fusion in occipito-atlanto-axial instability due to rheumatoid arthritis. A 60-year-old male patient was admitted to our clinic with severe neck pain, suboccipital pain, progressive weakness and no more ambulatory for 3 months (ranawat grade IIIB). Patient is followed for 15 years with diagnosis of rheumatoid arthritis. On his cranial magnetic resonance imaging (MRI) was detected C1- C2 dislocation, foramen magnum and spinal cord compression, brain stem compression, cervical myelopathy. Computed tomography (CT) scan of the cervical spine revealed the presence atlantoaxial subluxation. The patient underwent posterior decompression and occipitocervical fusion. Occipito cervical fixation is a very effective procedure for the treatment of craniovertebral junction instability. Especially, The currently used implants allow us to achieve high stability in rheumatoid arthritis.

Keywords: Occipitocervical instability, Craniocervical posterior fusion, Rheumatoid arthritis, Surgery

EP-0287 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Craniocervical Fusion in Occipito-Atlanto-Axial Instability due to Rheumatoid Arthritis: Case Report**

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Keywords: Occipitocervical instability, Craniocervical posterior fusion, Rheumatoid arthritis, Surgery

EP-0288 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Minimally Invasive Direct Thoracic Interbody Fusion (MIS-DTIF): Technical Notes of a Single Surgeon Study**

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Background: Minimally invasive direct thoracic interbody fusion (MIS-DTIF) is a new single surgeon procedure for fusion of the thoracic vertebrae below the scapula to the thoracolumbar junction. In this proof of concept study, we describe the surgical technique for MIS-DTIF and report our experience and the perioperative outcomes of the first four patients who underwent this procedure.

Method: In this study, we establish the safety and efficacy of MIS-DTIF performed on six spinal levels in four patients with degenerative disk disease or disk herniation. We recorded surgery time, blood loss, fluoroscopy time, complications, and patient-reported pain. Throughout MIS-DTIF, biplanar fluoroscopic imaging and electrophysiological-monitoring is utilized. The surgeon approaches the spine with a series of tissue dilations and inserts a working tube establishing direct connection from the outside of the skin to the disk space. Through this working tube, the surgeon performs a discectomy and inserts an interbody graft/cage, completed with MI posterior pedicle screw fixation.

Results: For 1/2 level patients average blood loss was 90ml/27mls, surgery time 43/61-minutes, fluoroscopy time 293/321-seconds, and hospital-stay 2/3 days. No clinically significant complications were encountered. Thirty days post-surgery, patients reported a significant reduction of 5.3 points on a 10-point pain scale.

Conclusion: MIS-DTIF with pedicle screw fixation is a safe and clinically effective procedure for fusions of the thoracic spine. The procedure is straightforward and overcomes many of the limitations of the current MI approaches to the thoracic spine. MIS-DTIF has the potential to improve patient outcomes and reduce costs relative to the current standard of care.

Keywords: Minimally invasive spine surgery, Spinal fusion, Spine surgery, Thoracic spine

EP-0289 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]**Assessment and Outcome of VITOM Micro-Discectomy in Lumbar Disc Prolapse**

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Background: Traditionally discectomy was done either by open method or by microscope. The problem with microscope is it is bulky instrument, occupy a large space in theater and costly. With the advent of new technology which lead to development of VITOM (Video Assisted Telescopic microscope). This study was done to evaluate and clinical outcome of discectomy with the help of VITOM exoscope.

Method: We have 30 patients from June 2015 to June 2016. All of either pain in the leg or having subtle neurology. All of these patients under went micro-discectomy with VITOM and tubular retractor. A 2 cm incision given and tubular retractor and discectomy was done. Average duration of surgery was 68 minutes. The blood loss was 120 ml. All Patient was discharge in one to three days. No patient has Dural tear, nerve root damage or recurrence of the disc.

Result: 90% of patients were satisfied with the procedure. The complication was minimal with this procedure. The advantage of this procedure was following, i.e, patient require less analgesia, less post-operative pain, less muscle damage, easy handling of the equipment, good for teaching for the registrar and students. One patient had Dural tear and no other complication was found with this procedure.

Conclusion: VITOM Micro-exoscopic discectomy is good procedure. It is a safe and effective procedure for discectomy. It has great advantage that patients had less pain therefore they require less analgesia and early return to work. There was very little complication with this procedure.

Keywords: VITOM, Micro-discectomy, Lumbar disc herniation

EP-0290 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Cervical Arthroplasty: Military Area Hospital of São Paulo – HMASP Experience

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Military personnel, due to the peculiarities of the profession, are susceptible to precocious cervical spine degeneration. Most of these lesions are refractory to clinical management and need to be surgically treated. In order to preserve mobility and the early return of patients to their activities, cervical arthroplasty is considered an important tool. Here we describe and analyze clinical and epidemiological aspects of patients undergoing cervical arthroplasty. This is a descriptive and retrospective study with a review of the medical records of patients submitted to cervical arthroplasty at the Military Area Hospital of São Paulo – HMASP from January 2014 to March 2016. A total of 22 patients, 12 males and 10 females. The age ranged from 31 to 58 years with a mean of 44.1 years. Of these patients, the most common clinical conditions were radiculopathy and myelopathy due to cervical disc herniation. Regarding the number of levels operated, 10 patients underwent a one level approach, 11 of two levels and 1 did not fulfill indication criteria for cervical arthroplasty (3 levels). Regarding the response to treatment, all parameters evaluated indicated clinical improvement. Cervical arthroplasty is a very promising technique in the treatment of spondylotic affections of the cervical spine, as well as providing functional improvement, preserving the physiological curvature and mobility of the cervical spine. The short hospital stay, the safety of the method and the quick return to activities make it a very favorable method.

Keywords: Cervical arthroplasty, Brazilian army, Cervical spine, Military

EP-0291 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Anterior Approach to the Thoracolumbar Spine: A 15-Year, Single-Center Experience

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Background: The anterior approach to the thoracic, thoracolumbar, and lumbosacral spine is an invaluable tool in the treatment of the adult with spinal pathology. It affords the spine surgeon excellent visualization and access to the anterior thoracic spine, the vertebral bodies, intervertebral disks, spinal canal, and nerve roots.

Method: We retrospectively reviewed the medical records of 22 patients treated by anterior approach during the last 15 years in the department of neurosurgery of Fattouma Bourguiba University Hospital, Monastir, Tunisia.

Results: The indication for surgery was trauma fracture in 14 patients, malignancy in 4, degenerative disease in 2 cases and

correction of scoliosis in 2 cases. Surgical approaches were determined based on the location and length of spinal involvement, including thoracotomy approach (5) thoracolumbar exposure (2) and lumbar exposure (15). Post-operative complications include two cases of pleural effusions, one case of pleurisy, one case of chylothorax and two wound infections. One of our patients died in the immediate post-operative course of hemodynamic failure. Three out of seven paraplegic patients improved substantially and six out of seven patients with kyphosis had complete reduction of their deformity. Neurological decline was observed in only 9% of patients.

Conclusion: The anterior approach to the thoracolumbar spine is a safe and effective technique that should be mastered by spine surgeons. Adequate preoperative evaluation and accurate surgical planning are key to achieve a good surgical outcome while minimizing the risk of complications.

Keywords: Thoracolumbar, Spine, Surgery

EP-0292 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Osteotomic Laminotomy in Spinal Stenosis and Herniated Nucleus Pulposus Patients: Techniques and Early Outcomes

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Background: Endoscopic spinal surgeries have been mostly limited to soft disc herniations. With the development of a newly designed endoscope with the outer diameter of 8.4mm and working channel diameter of 5.7mm with the field of view at 12 degrees (H View Stenoscope), virtually most spinal stenosis and HNP could be surgically treated. Furthermore, with the aid of endoscopic osteotome, time spent for laminotomy markedly decreases. One centimeter skin incision is made a few millimeters from the midline. Endoscope is introduced and after clearance of the muscles, laminotomy and medial facetectomy is performed with either crescentic or straight type osteotome. In this way, the ligamentum flavum could be removed in an en bloc manner. The amount of laminotomy could be adjusted according to characteristics of the target lesion.

Method: From January to March 2017, 12 patients underwent endoscopic osteotomic laminotomy (EOL) at Cheonan Woori Hospital, Cheonan, South Korea.

Results: Male to female ratio was 7 to 5. Mean age was 46.8. The disc levels were 7 at L4-5 and 5 at L5-S1. HNPs were 7 and spinal stenosis were 5. Mean VAS score decreased from 8.4 to 3.2 immediately after the surgery. Overall surgical time markedly decreased as compared with the same procedure done with endoscopic drill. Mean operation time spent for ipsilateral laminotomy, medial facetectomy and flavectomy was 17.6 minutes.

Conclusion: EOL could be the alternative to the classic open surgical laminotomy and the newly rising endoscopic stenosis surgeries where in most cases, endoscopic drill burrs are used

Keywords: Endoscope, Stenosis, Osteotome, Stenoscope, PSLD, Osteotomy

EP-0293 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Alternative Fixation Point in Occipitocervical Stabilization: Occipital Condyle Screw. Review of the Literature

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Background: Occipitocervical fusion (OCF) using screws and rods offers immediate stability and an high fusion rates. However, multiple cranial fixation points are required in order to compensate for the poor bony purchase. The occipital squama pathology or previous posterior fossa decompression may reduce the already limited available space. This issue is addressed by a novel technique of occipital condyle screws, which provides alternative fixation points. The aim of this study was to compare the occipital condyle screw with the standard OCF techniques as well as to compare available techniques of the occipital condyle screw insertion.

Method: A comprehensive “Medline” and “Web of science” database search was performed. Cadaveric, radiographic and case studies were included.

Results: The occipital condyle screw in comparison to the occipital plate enables an increased screw length, greater screw pullout strength, lower profile of the hardware and extended grafting surface. Both constructs have similar biomechanical properties (range of motion restriction, stiffness). Proximity of the vertebral artery and hypoglossal canal presents the greatest technical challenge of occipital condyle screw. Four surgical techniques with different entry points, cranial-caudal and medial angulations were described. None of these techniques is superior to the other.

Conclusion: Occipital condyle screw is a viable alternative to standard OCF techniques. Challenges exist due to the proximity of the vital anatomical structures. Choice between four available techniques depends on unique patient’s anatomy.

Keywords: Occipital, Condyle, Screw, Alternative, Occipitocervical, Fixation

EP-0294 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Patient Tailored Lumbar Spine Surgery

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It’s well known that the lumbar surgical procedures and patients population is diverse which make it necessitate diversity of management. As Confucius said “study the past, if you would divine the future”, every neurosurgeon has to study the history of lumbar disc disease and the evolution in management. He has to look into his own surgeries thoroughly, the choice of patient, clinical presentation, radiology, diagnosis, the procedure, the factors which influenced his decision making and the outcome. In this paper we will try to summarize our experience and how to learn from our past to divine our patient’s future

Keywords: Lumbar surgery, Minimally invasive, Microdiscectomy, Spine surgery

EP-0295 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Minimal Invasive Percutaneous Endoscopic Interlaminar Decompression in Patients with Lumbar Spinal Stenosis: A Retrospective Study

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Background: Conventional decompression for lumbar spinal stenosis has disadvantages like postoperative pain, blood loss, paraspinal muscle atrophy, and late ambulation, which lead surgeons to less invasive techniques. After the introduction of full-endoscopic interlaminar technique by Ruetten, full-endoscopic interlaminar approach, which was originally designed for addressing disc herniations, came into use in spinal canal decompression with further development of the technique. In this study, we have retrospectively evaluated 24 cases of lumbar spinal stenosis after percutaneous interlaminar full-endoscopic spinal decompression.

Method: In this study, bilateral spinal decompression was performed on 24 patients of lumbar spinal stenosis via percutaneous interlaminar full-endoscopic spinal decompression. 18 patients had one level decompression, six patients had multipl level decompression. Available data on 31 levels of decompression were evaluated retrospectively. Symptoms and scores, such as a visual analog scale (VAS), Oswestry Disability Index (ODI) were assessed preoperatively and postoperatively. Patients’ neurological findings and radiological findings were evaluated along with the VAS, ODI scores, operation time and perioperative blood loss.

Results: We have found statistically significant recovery concerning the VAS and ODI scores after the procedure ($p=0,001$; $p=0,002$ respectively). No significant perioperative blood loss was noted and the mean operation time was 62 min. for one level decompression; 96 min. for two-level decompression and 163min. for three-level decompression. No spinal instability was noted after one year follow-up.

Conclusion: Endoscopic spinal canal decompression leads to less tissue trauma and blood loss, lesser epidural scar formation, reduced postoperative pain medication requirement, and reduced loss of labor with a significant decrease in pain and disability.

Keywords: Lumbar stenosis, Endoscopic, Decompression, Interlaminar

EP-0296 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

The Concept of MISS in Lumbar Spine Radiculopathy: 18-Years Experience

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Aim: To evaluate the use of endoscopy as a minimally invasive spine surgery, in patients with lumbar spine radiculopathy.

Method: From 1998 to 2016, two groups of patients underwent spinal endoscopy procedures. Total number 1000 patients with herniated lumbar disc (n=740), lateral recess stenosis (n=50), recurrent disc (n=180), and recurrent lateral recess stenosis (n=20) and spondylolithesis GI (n=10) underwent posterior endoscopic interlaminar lumbar discectomy (PEILD) and/or foraminotomy (PEILF), included 660 males and 340 females with age ranged between 17-74 years. All patients underwent preoperative plain films (A-P, lateral and dynamic views), MRI and CT scan. Postoperative A-P, and lateral dynamic view x-ray films, CT / and or MRI on spine have been carried out for all patients. Follow up period ranged between 1 year – 18 years.

Results: 5 patients (0.5%) showed motor deficit, 800 patients (80%) reported sciatica free, 800 patients (80%) showed excellent outcome. Small dural tears occurred in 50 patients (5%) with no CSF leak. Two patients developed discitis. Two patients recorded superficial wound infection.

Conclusion: Spinal endoscopy is an effective Minimally invasive spine surgery. It could be a good alternative to standard open surgery in lumbar spine radiculopathy. It offers less tissue destruction, less hospital stay, and early return to work. It obviates the need of implants in cases of recurrent discs. Complications are comparable for those occurred in standard surgery.

Keywords: Spine, Endoscopy, Minimal invasive spine surgery

EP-0297 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Treatment of Late Post-Operative Haematoma Following Anterior Lumbar Spinal Surgery

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Background: Late retroperitoneal haematoma following anterior lumbar surgery occurs in patients 7-14 days post operatively, despite a normal day 1 CT scan. Sequelae include abdominal fullness, left anterior thigh and flank pain; anaemia; ureteric obstruction and hydronephrosis; resulting in prolonged hospital stay. A series of patients with delayed retroperitoneal haemorrhage and their possible causes, and a range of strategies to prevent this complication is presented.

Method: The study comprised of 17 patients, who underwent anterior lumbar surgery and developed late retroperitoneal haematoma. We identified factors contributing to development of the haematoma including operative technique (including ligation of abdominal vasculature during approach), post operative opioid use leading to constipation, and prophylactic anticoagulation.

Results: All patients had an abdominal CT scan at day 1, which showed no retroperitoneal haematoma, and proceeded to develop symptoms of left flank and thigh pain, and abdominal fullness about 7 - 10 days after surgery. A follow-up abdominal CT confirmed the presence of retroperitoneal haematoma of considerable size. All but one patients were treated conservatively. One patient had a retroperitoneal drain inserted via interventional radiology and subsequently developed infection. Two patients required ureteric stenting for hydronephrosis. In all patients treated conservatively, abdominal imaging revealed resolution of the haematoma 4-8

weeks later. Ligation of epigastric vessels during surgical approach is a potential means of decreasing the incidence of delayed retroperitoneal haematoma post ALIF.

Conclusion: We recommend conservative management of late retroperitoneal haematomas with regular biochemical and radiological monitoring (via CT and ultrasound), with blood transfusions and/or stenting if necessary.

Keywords: Complication, Anterior lumbar interbody fusion, Haematoma

EP-0298 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Percutaneous Endoscopic Foraminal Decompression for Persistent Radiculopathic Leg Pain for Foraminal Stenosis with Multiple Vertebral Compression Fracture

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Background: Osteoporotic vertebral compression fractures (VCFs) in the elderly patient can cause significant pain and lead to restrict their daily life activities. Augmentation procedures (Vertebroplasty (VP) and kyphoplasty (KP)) have reported as a standard treatment of VCFs in cases of not responding to conservative treatment. However, the remnant radiculopathic leg pain after augmentation procedures remained persistently due to foraminal stenotic change. We have tried to decompress the exiting nerve root by endoscopic foraminoplasty and report our results.

Method: 15 patients with persistent radiating leg pain after augmentation procedures of 56 patients were surveyed. We judged the radiculopathic pain of foraminal stenosis due to compression fracture by MR images and nerve root block. Percutaneous endoscopic foraminal decompression was done after selective exiting nerve root block to confirm exiting nerve radiculopathic pain. All remnant pain patients were evaluated at interval of 1-2 weeks and added injection if they had pain.

Results: Back pain intensity using VAS (visual analog scale) was decreased, from 8.5 before augmentation procedures to 3.2 after augmentation procedures. But radiating pain was not changed significantly (VAS: 7.6). After endoscopic foraminal decompression, VAS decrease from 7.6 to below 2.7. Successful outcome was determined if pain reduction exceeded 50% relief. 13 of the 15 patients (86.7%) showed successful responses.

Conclusion: Endoscopic foraminal decompression is one of the effective methods to decrease the persistent radiculopathic pain after augmentation procedures in the patients with vertebral compression fracture.

Keywords: Percutaneous endoscopic foraminal decompression, Foraminal stenosis, Vertebral compression fracture

EP-0299 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Lumbar Minimally Invasive Spine Surgery - MISS: Military Area Hospital of São Paulo – HMASP Experience

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Minimally invasive spine surgery (MISS) has been used increasingly due to its lower aggression to tissues and faster patient recovery. Efficacy and safety in the military, however, have not been yet reported. We describe the experience of the Military Area Hospital of São Paulo Neurosurgery Department, Brazilian Army. Retrospective data of all patients who underwent Lumbar MISS between 2012 and 2016 at Military Area Hospital of São Paulo were analyzed. Characteristics such as gender, age, clinical presentation, presence or absence of spondylolysis, presence or absence of spondylolisthesis, time to return to military activities, Oswestry Scale score (ODI), need for conversion to open or further surgery requirement were raised. Among 59 patients, 70% were males and 30% females. The age ranged from 19 to 76 years, mean of 53.3 years. The majority had lumbago with sciatica due to lumbar disc herniation and 1 level disease. All patients reported significant clinical improvement of pain and improvement of quality of life after the procedure. There was no need for conversion to open surgery, no need for further surgical intervention, no infection. One patient presented with superficial wound dehiscence. Lumbar MISS is a technique safe to use in military patients, even those with high biomechanic demand activities. Short hospital stay, quick return to activities, fewer surgical trauma, fewer postoperative pain and shorter hospitalization time, make it a very effective option in cases of need for shorter periods of work leave, as in the military population.

Keywords: Lumbar minimally invasive spine surgery, Brazilian army, Lumbar spine, Military

EP-0300 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

The Value of MISS in Double Level Lumbar Spine Radiculopathy

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Aim: To evaluate the use of endoscopy as a minimally invasive spine surgery, in patients with double level lumbar spine radiculopathy.

Method: From 2004 to 2016, out of 1000 of patients with lumbar spine radiculopathy, underwent spinal endoscopy, only 225 patients underwent uniportal spinal endoscopy for double level spine radiculopathy, double level lumbar disc (n=200), double level lateral recess stenosis (n=15), and bilateral double level lumbar lateral recess stenosis (n=10). included 100 males and 125 females with age ranged between 25-55 years. All patients underwent preoperative plain films (A-P, lateral and dynamic views), MRI and/ CT scan. Follow up period ranged between 6 – 144 months.

Results: 200 patients (88,9%) reported sciatica free, 200 patients (88,9%) showed excellent outcome. Small dural tears occurred in 5 patients (2,2%) with no postop CSF leak. Two patients (0,9%) recorded superficial wound infection. Contiguous spine levels were reported in 215 patients (95.6%) and non contiguous spine levels in 10 patients (4.4%). All patients showed post operative intact spine instability.

Conclusion: Spinal endoscopy is an effective Minimally invasive spine surgery. It is a real practice rather than imagination. It could be a good alternative to standard open surgery in double lumbar spine radiculopathy. It offers less tissue destruction, It obviates the need of implants, less hospital stay, and early return to work. Complications are comparable for those occurred in standard surgery.

Keywords: Minimal invasive, Spine, Double level, Endoscopy

EP-0301 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Management of Atlanto-Axial Posterolateral Dislocation Associated with a Type II Displaced Odontoid Fracture

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Atlanto-axial posterolateral dislocations associated with an odontoid fracture are rare traumatic lesions of the upper cervical spine. Their therapeutic management is discussed. We report the second case of the posterolateral atlanto-axial dislocation associated with a fracture of the displaced type II odontoid treated retropharyngeal approach. A 28-year-old man without a specific pathological history admitted to the emergency room in a table of upper cervical spinal trauma following by frontal collision of two vehicles. The lesional balance had found a left brachial monoparesis and a posterolateral atlanto-axial dislocation associated with a fracture of the displaced type II odontoid. The patient was treated retropharyngeal approach anteriorly after reduction by intraoperative traction to the stirrup maintained by a weight of ten kilograms. The evolution was marked by a complete recovery of the left brachial monoparesis at the end of forty-five days guided by physiotherapy.

Keywords: Left brachial monoparesis, Posterolateral atlanto-axial dislocation associated with fracture of the displaced type II odontoid, Per operative traction at the stirrup, Retropharyngeal anterior approach

EP-0302 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Two-Year Results of NUBAC™ Disk Arthroplasty System Implanted for the Treatment of Lumbar Disc Herniation: Baskent Experience

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Aim: To assess the 2 year results of lumbar disc herniation patients treated with NUBAC™ disc arthroplasty system.

Method: 10 patients (<45 years), with large disc herniation, otherwise relatively well preserved disk who presents with

recalcitrant leg pain refractory to conservative treatment were included to the study. NUBAC™ disk arthroplasty was performed via standard posterior approach. Peroperative and 2 year follow-up scores (VAS, ODI) were obtained. Plain X-rays were performed on the postoperative first day and 6, 12 and 24 months after surgery while MRI and dynamic X-Rays were performed on the postoperative 24 months. Furthermore, adjacent disc degeneration were evaluated on the T2-weighted midsagittal MR images according to Pfirrmann classification.

Results: 5 of 10 patients were male. Average patient age at the time of surgery was 32.3. Statistically significant difference was observed in the radicular pain group ($p < 0.05$) while the difference was not significant in terms of low back pain ($p > 0.05$) 2 years after surgery. Lumbar MRI's performed 2 years after surgery did not show any additional degenerative changes on the adjacent disks. Any vascular and/or neurological complication did not occur.

Conclusion: NUBAC™ is a promising device which may help surgeons to reduce pain while restoring motion and protect adjacent disks.

Keywords: Lumbar spine, Pain, Lumbar disk herniation, Arthroplasty, Partial disc replacement, NUBAC

EP-0303 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Basilar Invagination with Atlantoaxial Dislocation in a 5 Year-Old Child: Case Report

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Basilar invagination (BI) is a condition characterized by telescoping of the upper cervical spine (more specifically the odontoid process) into the foramen magnum and it may be associated with a wide spectrum of other anomalies such as atlantoaxial dislocation (AAD), Klippel-Feil syndrome, atlas assimilation or dens malformation. Especially, in the presence of the compression of the spinomedullary junction, it needs surgical treatment. A 5-year old boy was referred to our department with a 1-week history of neck pain and torticollis. These complaints occurred after a minor trauma. His neurological examination revealed a mild paraparesis and upper motor neuron symptoms such as exaggerated deep tendon reflexes. Scan techniques including lateral plain radiograph, cervical spinal computed tomography and cervical spinal magnetic resonance imaging were performed. These scan techniques revealed basilar invagination, atlantoaxial dislocation, atlas occipitalization and fusion of C2-C3 as a result of Klippel-Feil syndrome. Atlantodental interval was measured as 11.1 mm. He underwent a surgical procedure including C1 lateral mass and C2 transpedicular screw implantation. Two spacers were placed in the C1-2 facet joints which were specially designed for this patient. Postoperative course was uneventful and postoperative scan techniques revealed improvements in radiological parameters. Atlantodental interval was measured as 4 mm postoperatively. In this report, we presented a 5-year old child whom was treated successfully with C1-2 stabilization for BI and AAD.

Keywords: Basilar invagination, Atlantoaxial dislocation, Klippel-Feil syndrome

EP-0304 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Economic Performance of Oblique Lateral Lumbar Interbody Fusion (OLLIF) with a Focus on Hospital Throughput Efficiency

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Background: Oblique posterior lateral lumbar fusion (OLLIF) allows for fusion of the lumbar spine through a 10-15 mm incision, with faster surgery times and easier approach than any previous technique. The reduction in the use of these key hospital resources suggests that hospitals that are constrained by OR or hospital bed availability may be able to achieve greater throughput efficiency by increasing the overall percentage of patients receiving the OLLIF surgery.

Method: This was a retrospective case series including 69 OLLIF patients and 55 open TLIF controls. All procedures were completed by the same surgeon. To eliminate selection bias, the TLIF control group was selected from patients who underwent surgery before the surgeon started performing OLLIF. The study size derives from the number of surgeries performed between March 2012 and December 2013. We present 69 OLLIF procedures, vs 55 open-TLIFs on 125-levels, and monetize quantifiable differences in resource utilization.

Results: LOS for OLLIF surgeries was 58.5% of that seen with TLIF surgeries (3.1-vs.-5.3 days). The trend of shorter LOS for OLLIF surgeries remained consistent when surgeries were stratified and matched for the same number of levels involved. When LOS was converted to inpatient operating costs of the hospital, the difference in cost of surgical admission was \$6,701 for OLLIF vs. \$11,583 for TLIF.

Conclusion: The difference in cost of surgery attributable to surgical time was \$6,671 for OLLIF vs. \$16,029 for TLIF. When converted to inpatient operating costs of the hospital for surgical admission: \$6,701 for OLLIF vs. \$11,583 for TLIF.

Keywords: OLLIF, Clinical economics, Minimally invasive fusion, Healthcare cost reduction

EP-0305 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Spinal Cord Herniation: Proposal for a New Surgical Procedure

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The spinal cord herniation is a rare cause of myelopathy. It has been described almost exclusively at the thoracic level. His diagnosis is usually late. We report the case of a 48-year-old woman. The patient presented an intercostal neuralgia at the level of the dermatome of T6, Proprioceptive and thermoalgesic anesthesia below, a paraparesis and sphincter disorders. MRI revealed a spinal cord herniation with a ventral displacement of the thoracic spinal cord at the level of T5. After posterior laminoplasty of the T5, T6 and T7 levels, the dura

mater was opened. The dentate ligaments were sectioned below the hernia at the T6 and T7 levels. The hernia was reduced and the spinal cord reinstated in the intradural space without widening the dural defect. The spinal cord was suspended by non-absorbable wire, passed through the remains of the sectioned dentate ligaments then sutured on the inner side of the dura mater. This procedure was performed on the medullary segment below the hernia in order to reduce the risks of iatrogenic neurological deteriorations secondary to our procedure. It allowed us to maintain the spinal cord in the intradural space. This was confirmed by an MRI made at 48 hours of the surgical procedure and then at 6 months. A patient's neurological improvement was obtained. This procedure, to our knowledge, has not been described in the literature. It could be added to other surgical procedures in the therapeutic arsenal of spinal cord herniation.

Keywords: Spinal cord, Herniation, Dentate ligaments

EP-0306 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Discectomy vs Sequestrectomy: Do We Really Need to Take the Disc Out?

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Background: Discectomy is one of the most common operations for every level of neurosurgeon, from the trainee to the spine surgeon. But, do we need to take (almost) all the disc out? Does it reduce the odds of recurrence? Or is a simple sequestrectomy enough?

Method: We compared our own results in terms of pain improvement (VAS), Functional outcome (ODI) and recurrence rates for 164 patients who have undergone surgery for discectomy (Gr A., Mean age 58,3 yrs), with a second group of 39 patients with similar demographics who only had sequestrectomy (Gr B., Mean age 56,5 yrs).

Results: For Group A mean VAS improvement was 5,27, Mean ODI improvement was 44,32 and recurrence rate was 9,16%. For Group B mean VAS improvement was 4,96($p>0.05$), Mean ODI improvement was 47,54($p>0.05$) and recurrence rate was 7,93%($p>0.05$).

Conclusion: With the rare exception of the intraoperative finding of a very "soft" disc with an obvious tendency to repropulse into the canal sequestrectomy seems to be as much of an option as a classic discectomy (or microdiscectomy). In 5 yrs of followup there were no statistically significant results in terms of ODI, VAS or recurrence rates that would mandate discectomy over sequestrectomy.

Keywords: Discectomy, Sequestrectomy, Recurrence

EP-0307 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Late Results of Surgical Treatment of Peripheral Nerves Gunshot Injuries

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Aim: To analyze late results of surgical treatment of the sequela of peripheral nerve gunshot injuries (PNGI).

Method: The analysis of treatment results of 19 injured persons with PNGI. Injuries were received during a local armed conflict in the east of Ukraine.

Results: 20 surgeries were performed. 8 (42.1%) persons underwent upper extremity nerve surgeries, and 11 (57.9%) persons underwent lower extremity nerve surgeries. 4 persons with ulnar nerve lesions and 3 injured persons with median nerve lesions were operated on. Another injured person had both median nerve and radial nerves lesions. 4 persons with sciatic nerve lesions and 7 injured persons with peroneal nerve lesions underwent surgeries. Shell, that wounded: 5.45 caliber bullet - 6 (31.6%); fragments from the grenade shells explosion (AGS) - 3 (15.8%); fragments of the mines released from a mortar launcher - 10 (52.6%). During surgery, the anatomical nerve rhexis with the end neuromes formation was detected in 10 (52.6%) injured persons, 5 (26.3%) injured persons had inner neuromes. Nerve neurolysis was performed in 3 cases; neurolysis with the installation of a temporary stimulator was performed in 6 cases. Microneuroorrhaphy was performed for 7 persons, and autotransplantation was made for 4 persons. Motor function recovery was evaluated using the scale of R.B. Zachary, W. Holmes (1946) (modified at St. Petersburg Research Institute named after Polenov). 8 (42.1%) injured persons had 0-2 points, 5 (26.3%) injured persons had 3 points, other 5 (26.3%) injured persons had 4 points, 1 injured person (5.3%) had 5 points.

Keywords: Surgical treatment, Peripheral nerves, Gunshot injuries, Late results

EP-0308 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Adjacent Cortico- Cancellous Bone Graft in Anterior Cervical Fusion - A New Technique

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Aim: To assess the efficacy of cancellous and cortical bone grafts harvested from adjacent vertebral bodies in Anterior Cervical Discectomy and Cage Fusion.

Method: After anterior cervical discectomy and inter-body cage placement, anterior wall of adjacent vertebral body is cut at center and using a curette cancellous bones harvested and packed in the cages. Over all fourteen patients underwent this technique. While majority were single level three patients had two level fusion.

Results: We observed that the fusion was good in all patients and the settlement of inter body space was not clinically significant. Vertebral body anterior wall collapse was seen in one patient. Over all we did not observe vast difference in comparison with other inter body cage fusions alone.

Discussion: Cervical vertebral body has abundant cancellous bone which has high osteogenic potential. We emphasize its utility in such cases where in the cages can be packed with rich cancellous bones harvested from adjacent vertebral bodies. In our limited experience we were satisfied with the technique and result. The cancellous bone curettage is avoided close to the disc space since fusion process starts at these ends. Removal of cancellous bone leaves an empty space in the vertebral body. More number of cases and longer duration of follow up is expected in due course.

Keywords: Fusion, Graft, Cervical spine

EP-0309 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Comparisons of Percutaneous Transforaminal Endoscopic Lumbar Discectomy Versus Microendoscopic Discectomy (Destandau's Technique) -For Lumbar Disc Herniation

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Lumbar disc herniation is one of the most common problem for which patient seeks surgical spinal treatment. Now a days spinal surgeons prefer minimally invasive procedure for quicker recovery, less surgical trauma and shorter hospital stay. We operated 110 patients of lumbar disc herniation of different level by Microendoscopic Discectomy and 24 patients by Percutaneous Transforaminal Lumbar Discectomy. Each procedure has some limitations and advantages.

Keywords: Lumbar Disc herniation, Percutaneous transforaminal, Microendoscopic discectomy

EP-0310 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Carpal Tunnel Release

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Aim: To compare results of open and endoscopic decompression of carpal tunnel release.

Method: 104 surgical interventions for carpal tunnel syndrome (CTS). Men 21, women 83. Average was 56 years. Indications for surgery were clinical picture, ENMG data and ultrasound of carpal tunnel. For the self-estimating of patients status was used BCTQ. 49 patients was in open surgical decompression group (group A) and 55 - single-port endoscopic decompression technique by K.Krishnan (group B). The results were evaluated 30 days after the surgery.

Results: In group A, before operation, mean amplitude (ENMG) was 3.24 mV, latency 5.28 ms. Estimation by BCNQ was SSS 2,95 and FSS 2,9. Average area of intracanal part of medial nerve (MN) - 0.1 sq.cm. In group B, before operation estimation by BCNQ was SSS 3, FSS 2,9, mean amplitude (ENMG) was 3,7 mV, latency 5.5 ms. Average area of intracanal part of MN 0.1 sq.cm. 30 days after surgery. In group A, estimation by BCNQ was SSS 1,6 and FSS 1,9. Mean amplitude (ENMG) 3.7 mV, latency 4.2 ms. Average area of intracanal part of MN - 0.11 sq.cm. In group B, estimation by BCNQ was SSS - 1,85, FSS - 2. Mean amplitude (ENMG) was 4.1 mV, latency 4,9 ms. Average area of intracanal part of MN - 0.12 sq.cm.

Conclusion: Endoscopic decompression of MN in patients with CTS has advantages over open technique in a more rapid postop functional recovery by BCTQ only, and has not by ENMG and ultrasound data.

Keywords: Endoscopic decompression, Medial nerve, Carpal tunnel

EP-0311 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Posterior Laminoforaminotomy in the Treatment of Lateral Cervical Herniated Disc and Foraminal Stenosis

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Background: Posterior cervical laminoforaminotomy is an effective surgical treatment in selected cases of cervical radiculopathy caused by posterolateral herniated discs or foraminal stenosis. The aim of the present study was to evaluate the surgical techniques, rates of complications, long-term outcomes, advantages, and disadvantages of keyhole foraminotomy retrospectively.

Method: Keyhole foraminotomy was performed in 83 patients. In 51 patients (61.5%) soft disc herniation was removed, and in 32 of them (38.5%) osteophytes were evident. The clinical data were evaluated according to Odom's criteria, and the mean followup time was 6 months.

Results: Postoperative results were classed as excellent in 66 patients (79.5%), good in 13 patients (15.7%), fair in 3 patients (3.6%), and poor in only 1 patient (1.2%). Radiculopathy symptoms regressed in 79 patients (95%). Among the 83 patients, surgical complications (dural injury and level error) were noted in 2 patients (2.4%).

Conclusion: Posterior laminoforaminotomy is applied to selected patients with a low complication rate. The advantages of this surgery are suitable visualization of the nerve root, preserved motion of the operated segment, avoidance of cervical instability, and a decrease in the length of hospital stay.

Keywords: Cervical herniated disc, Foraminal stenosis, Posterior laminoforaminotomy

EP-0312 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Conventional Lumbar Arthrodesis Versus Minimally Invasive Lumbar Arthrodesis: Experience of the Military Area Hospital of São Paulo - HMASP

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Military population are under high biomechanical demand and need to be promptly ready to service. Minimally invasive spine surgery (MISS) has been used increasingly due to its lower aggression to tissues and faster recovery. Lumbar arthrodesis is a well-known and safe technique for surgical treatment of spinal disorders. The goal of this study is to describe clinical and epidemiological aspects, compare functional and quality of life outcomes of patients submitted to two different surgical approaches of the lumbar spine. This is a descriptive, retrospective and comparative study of the medical records of patients submitted to spinal surgery at the

Military Area Hospital of São Paulo - HMASP from January 2014 to March 2016. Patients submitted to arthrodesis of the lumbar spine and Lumbar MISS were selected for comparison between the groups. Clinical improvement (VAS) and improvement in the quality of life (ODI) were described and compared with the treatments proposed. The sample consisted of 38 patients, 13 males and 25 females, ranging in age from 36 to 77 years submitted to conventional lumbar arthrodesis. These patients were compared to the group submitted to Lumbar MISS, which consisted of 29 patients, 12 males and 17 females, ranging in age from 19 to 76 years. Of these patients, the most common diagnosis was lumbago with sciatica due to lumbar disc herniation. There was a greater reduction of pain and a greater increase in the quality of life of patients submitted to MISS when compared to the group submitted to conventional lumbar arthrodesis.

Keywords: Lumbar minimally invasive spine surgery, Brazilian army, Lumbar spine, Military, Lumbar arthrodesis

EP-0313 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Anterolateral Approach for Unstable Lumbar Burst Fracture with Anterior Compression

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Background: Lumbar burst fractures are common spinal injuries that cause severe instability with kyphotic deformities and neurological complications requiring Surgical decompression and reconstruction with spinal instrumentation for unstable burst fracture, but there is controversy about the optimal surgical approach anterior, posterior or combined approach. The aim is to assess the efficacy & safety of Anterolateral approach in decompression and reconstruction with spinal instrumentation for lumbar burst fractures.

Method: A retrospective study including 16 patients 10 males and 6 females with lumbar burst fractures and anterior compression treated operatively by anterolateral approach for corpectomy and single level fusion by using expandable cage or mesh cage loaded with bone graft and plat with screws. The clinical and radiological follow up after discharge from the hospital ranged from 12 to 24 months.

Results: All patients improved regarding the frankel score more than one grade after surgery, except 2 cases of grade A didn't improve. Mean preoperative visual analogue scale was 7.4 improving to 0.9 postoperatively. The mean Local kyphosis improved from 8.8° before surgery to -1° after surgery.

Conclusion: Anterolateral approach is feasible, effective, and safe approach for unstable lumbar burst fractures. angular deformity is successfully corrected when the anterior approach is used.

Keywords: Lumbar burst fracture, Anterolateral approach, Angular deformity

EP-0314 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Analysis of Clinical Result in Three Different Route of Percutaneous Endoscopic Transforaminal Lumbar Discectomy Approach for Lumbar Herniated Disc

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Background: The percutaneous endoscopic transforaminal lumbar discectomy (PETLD) approach well-known minimally invasive approach for lumbar disc herniated that can reduced recovery periode and pain after surgery. The aim of this study was to assess the feasibility of three percutaneous transforaminal endoscopic discectomy approach to lumbar disc herniated.

Method: The PETLD route was performed for 32 patients exiting type (group A) and the 46 patients intervertebral type (group B) and 30 transversing type (group C). Outcomes scored with visual analogic scale (VAS), and Macnab's criteria.

Results: Group A the mean follow-up period was 6.4 ± 3.7 months. Preop VAS 7.4 ± 0.9 and post op VAS 2.4 ± 1.1 significant differences in VAS (p<0.01). The Mcnabs was excellent in 6 (18.7%), good in 22 (68.7%) and fair in 4 (12.5%). Group B The mean follow-up period was 7.2 ± 3.2 months. Preop VAS 7.08 ± 0.8 and post op VAS 1.6 ± 0.9 significant (p<0.01) The Mcnabs was excellent in 24(52.2%), good in 19 (41.3%) and fair in 3 (6.5%). Group C The mean follow-up period was 6.6 ± 3.4 months. Preop VAS 7.3 ± 0.8 and post op VAS 1.4 ± 0.6 significant (p<0.01). The Mcnabs was excellent in 17 (56.7%), good in 13 (43.3%).

Conclusion: Severe pain existed preoperatively but a good result achieved through a PETLD exiting type approach but handicapped by intermittent remnant pain after surgery, surgeon should be considered and to alleviate this selective transforaminal epidural block could be performed.

Keywords: Lumbar disc herniated, Percutaneous transforaminal endoscopic lumbar discectomy, Selective transforaminal epidural block

EP-0315 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

WITHDRAWN

EP-0316 [Spine and Peripheral Nerve » Surgical Technique (Incl. Neuroendoscopy)]

Accuracy of Percutaneous Pedicle Screw Insertion in Spinal Fixation of Traumatic Thoracic and Lumbar Spine Fractures

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Background: Percutaneous insertion of pedicle screws has been developed as a minimally invasive alternative to the open technique for different spinal procedures. As screw misplacement has a potential effect on neural structures and reduces the stability of the construct; the purpose of our study is to determine the accuracy of the percutaneous pedicle screw insertion.

Method: Sixty consecutive patients with thoracic and lumbar spine fractures were operated using percutaneous pedicle screw fixation. Postoperative CT images were evaluated to assess screw position. A screw was identified as cortical encroachment if the pedicle cortex could not be visualized. Frank penetration was defined when screw trajectory was obviously outside the pedicle boundaries and subdivided according to Wiesner as minor (<3 mm), moderate (3–6 mm) and severe (>6 mm).

Results: In all studied 60 patients; 410 pedicle screws were placed in a percutaneous technique, with 294 screws of them (71.7%) were ideally placed inside the pedicle. In 11 cases there were 66 screws (16%) showed pedicle encroachment. While, in 23 cases there were 60 screws (14.6%) showed pedicle penetration. The screw misplacement was identified in 5.3% of the inserted screws (4.8% and 0.5% in moderate and severe screw penetration respectively). In our percutaneous screw insertion series, the neurological injury incidence was 5% (3 cases).

Conclusion: The percutaneous pedicle screw insertion is safe and reliable technique and found to be more challenging in the thoracic spine. Larger series might be needed in order to establish the average rate of neurological injuries associated with screw misplacement.

Keywords: Percutaneous, Screw, Spine, Fixation, Fractures

EP-0317 [Spine and Peripheral Nerve » Spinal Tumors]

Our Experiences in Radiofrequency Ablation Treatment in Vertebral Metastases

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Background: Radiofrequency ablation (RFA) is a method found for the treatment of liver and kidney metastatic lesions. RFA has begun to be used in the treatment of bone metastases in recent years and its use is increasing. RFA stops the transmission of pain signal with the affect of heat applied to the lesion and delays tumor growth by creating coagulation necrosis.

Method: We examined 16 patients with vertebral metastases who underwent RFA treatment at Pamukkale University Neurosurgery Department between 2014-2016. Our patients are 10 male and 6 female and mean age is 54 (33-82) years. 5 patients were lung cancer (ca), 3 were breast ca, 2 were bladder ca, 2 were bone plasmacytoma and 4 were unknown primary tumors. All of our patients complained of severe pain consistent with the lesion site. 5 patients under general anesthesia and 11 patients under local anesthesia were treated. The procedure was performed away from pedicle and spinal canal by real-time monitoring then the lesions were filled with cement.

Results: 1 patient developed lower limb paresia. All of our patients had decreased pain complaints in their follow-up.

Conclusion: Bone metastases are the most common complications of the malign tumors. Due to highly hematopoietic activity and spinal vascularization, vertebrae are the most common area for the bone metastases. RFA, surgical treatment, radiotherapy and systemic chemotherapy are the options in treatment of bone metastases. RFA is a minimally invasive treatment, has less complications, increases quality of life, and reduces patient hospitalisation. We recommend RFA in appropriate patients within the correct indications.

Keywords: Vertebral metastases, RFA, Minimal invasive

EP-0318 [Spine and Peripheral Nerve » Spinal Tumors]

Conus Medullaris and Cauda Equina Dermoid Cysts Discovered at Surgery (2 Cases)

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Demoid cyst is a rare benign tumor that affects the central nervous system, its spinal location is well recognised. However its rarity makes its diagnosis overlooked. We report of two cases of spinal dermoid cysts that were discovered at surgery. A male patient aged 26 and female patient aged 38 presented resembling three year sciatic pain that worsen by appearance of urinary incontinence in both and erectile dysfunction in the male. Neurological exam revealed motor and sensory deficits. Neuroimaging by CT scan and MRI revealed a conus medullaris mass with extension into the cauda equina. A diagnosis of an epindymoma of the filum terminale was made preoperatively as per imaging characteristics, the chronicity of clinical course and the localisation. Intraoperatively intra-dural extra-medullary dermoid cysts were discovered that were partially resected and confirmed histologically. Both patients improved their neurological deficits with no signs of recurrence at follow up MRI at 1 year. The rarity of demoid cysts in the conus medullaris and cauda equina can lead to its diagnosis being made only at surgery.

Keywords: Dermoid cyst, Neuroimaging, Conus medullaris, Cauda equina

EP-0319 [Spine and Peripheral Nerve » Spinal Tumors] Lumbar Spinal Epidural Angiolipoma Mimicking a Discal Herniation

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Spinal angiolipomas are fairly infrequent benign tumours that are usually located in the epidural space of the thoracic column and represent 0.14% to 1.3% of all spinal tumours. Lumbar angiolipomas are extremely rare, representing only 9.6% of all spinal extradural angiolipomas. The present report describes a rare case of a lumbar epidural angiolipoma, in a 38 year-old woman presenting with a 5 days history of paralytic sciatalgia. The clinical examination, found an obesity, and a neurological deficit of the right leg. Th lumbar CT, showed a typical image of a discal herniation at the L4-L5 level. Per operative, we are astonished not to find a discal herniation, but a fibrous sticky yellowish hypervascular tumor in the anterior epidural space, encompassing the dural sheath, and fusing into the foramina of L5. Histological study revealed the tumor as an angiolipoma. Symptoms were relieved after tumor excision, with immediate recovery of the deficit. After one month, there were no sequelae. Although extremely rare, lumbar epidural angiolipoma should be considered in the differential diagnosis of lumbar spinal epidural lesions. MRI is essential for diagnosis. The prognosis after surgical management of this lesion is favorable.

Keywords: Lumbar angiolipoma, Paralytic sciatalgia, Spine tumor

EP-0320 [Spine and Peripheral Nerve » Spinal Tumors] Giant Thoracic Neurinoma in Arena Watch

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Also called Schwannomas are benign tumors, slow growth, derived from Schwann cells, represent 30% primary spinal neoplasms. 70% intradural, extradural 15% pure, 14% intra and extradural at a time (hourglass), 1% intramedullary pure. Male 57 years old, Edo Mexico, non-chronic degenerative, non-toxicomanias. Refers to start 2 years ago with sensation of (numbness and tingling) in the left costal region. 1 year ½ prior to admission symptoms progress, Flashing. 6 months ago - pain on contact with clothing. 1 month - lower left extremity weakness. EF. Decreased sensitivity in dermatomes T9 T10 left side, Patellar reflexes and Aquileo (+) left. MRI Contrast is observed intra and extradural tumor as well as intra-thoracic left-root dependent T9, which enhances the contrast medium with pedicle and vertebral body erosion of T9 and extension both T8 and T10. Left posterolateral approach, thoracotomy and resection of the tumor in three portions: thoracic, epidural and intradural. Report of pathology reports compact pattern with Antoni type A cells and VEROCA bodies. Giant thoracic Schwannoma. With adequate evolution by external consultation, screening was completed

by genetic test for neurofibromatosis type 2, negative for it. The teaching objectives of this presentation are to inform about the management and treatment of this rare pathology in our population and to determine standards of treatment and follow-up of these patients by means of screening test for neurofibromatosis type 2 and follow-up with magnetic resonance and genetic counseling.

Keywords: Neurinoma, Arena watch, Toluca, Mexico, Giant thoracic

EP-0321 [Spine and Peripheral Nerve » Spinal Tumors] Epidermoid Cyst of Conus Medullaris: Two Cases Report

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Epidermoid cysts are known as embryonic or acquired ectopic aberrations of the ectoderm. Epidermoid cysts account for less than 1% of all intraspinal tumors. Case 1: A 49 year-old woman presented with low back pain and spasm in her upper legs for five months. All systemic and neurological examination findings were normal. Her MRI revealed that a mass lesion in spinal canal at L3-L4 levels. Case 2: 24 year-old woman applied complaint of loss of strength in the legs which has paresthesia and spasticity. In her neurological examination, her right leg was paralysed, her left leg was not paralysed but there were 2/5 loss of strength of muscle of her big toe in plantar end dorsal flexion. Her MRI revealed that a mass lesion in spinal canal at L3-L4 levels. Intramedullary tumor was seen and tumor substance was completely emptied intracapsularly in two cases. But the tumor capsule was left in place because of attached to the spinal cord. There was no neurological complication. And the fourth day after the surgery the patients were discharged without any problem. We report two cases of adult intramedullary epidermoid tumor at the conus medullaris although epidermoid tumors have been seen among young or adolescent patients. There are two different surgical approaches for intramedullary epidermoid cysts. One defends taking out of all cyst wall; the second opinion advises only evacuation of cyst ingredients (contents). We advise that only evacuation of epidermoid cyst content is very much enough.

Keywords: Conus medullaris, Epidermoid cyst, Surgery

EP-0322 [Spine and Peripheral Nerve » Spinal Tumors] Pediatric Extradural Thoracic Schwannoma: A Rare Case Report

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Schwannomas are benign tumors originating from Schwann cells. They are mostly seen in adults between 40 and 60 years and rare in children. Pediatric schwannomas often occur in as a part of neurofibromatosis type-2 (NF-2). Most of spinal schwannomas locates intradural extramedullary and extradural location of spinal schwannomas seems so rare especially in pediatric ages. Ten-year-old male child with mid-back pain and no neurological deficit showed low degree scoliosis. Th3 and Th4 spinal tumor was detected in magnetic resonance imaging. Extradural tumor was total excised

and immunohistochemistry noted Spinal Extradural Schwannoma. Further radiological and genetic investigations showed no evidence of neurofibromatosis. We are presenting this case due to its rarity and we recommend that extradural schwannoma should also be included as a differential diagnosis in pediatric thoracic extradural tumors. Method of surgery must be planned according to patients' age, co-morbid diseases and tumor's nature and location.

Keywords: Extradural schwannoma, Pediatric thoracic schwannoma, Pediatric spinal tumor

EP-0323 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Extradural Angiolipoma Manifested After Normal Vaginal Delivery: A Case Report

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Extradural Spinal angiolipomas are extremely rare benign neoplasms made up of mature lipocytes with abnormal blood vessels. Spinal angiolipomas represent only 0.14–1.2% of all spinal axis tumors. A case of thoracic spinal extradural angiolipoma producing acute spinal cord compression in a 35-year old housewife is presented. Patient presented with sudden onset of lower limbs paralysis and urinary incontinence for 1 month after vaginal delivery. Patient was diagnosed as dorsal spine angiolipoma which was treated surgically with excellent outcome. Spinal angiolipomas are rare tumours but it is mandatory to include it in the differential diagnosis of the spinal extradural space occupying lesions. pregnancy and vaginal delivery may suddenly exacerbate the condition. The best investigation to choose to diagnose these lesions is definitely magnetic resonance imaging of the spine. The aim of treatment of extradural angiolipomas of the Spine is to resect the tumor in toto surgically with no need of adjuvant therapy, surgery alone can lead to excellent outcome.

Keywords: Spinal angiolipoma, Magnetic resonance imaging, Spinal extradural neoplasm, Spinal cord compression, Vaginal delivery

EP-0324 [Spine and Peripheral Nerve » Spinal Tumors]

Aggressive Osteoblastoma of the Cervical Spine: A Case Report

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Osteoblastomas are rare benign, primary bone tumors which frequently arise in the spine. There are different variants of osteoblastomas. The aggressive type causes pronounced bone destruction, soft tissue infiltration and epidural extension. The bone scan is the most sensitive examination to determine criteria of aggressivity. Patients often present with dull back pain sometimes associated with painful scoliosis. Neurological manifestations such as radiculopathy or myelopathy are due to mass effect on nerve roots or the spinal cord. Optimal treatment is complete surgical

resection, preceded by embolisation. Adjuvant radiotherapy is indicated according to quality of resection and criteria of aggressivity. We report a case of a 19 years-old-man, presenting with a history of cervico-brachial neuralgia and weakness of the right upper limb lasting from 18 months. The CT scan and MRI showed a bone tumor of the posterior arch of C5. The patient underwent complete resection of the tumor, but an injury of the vertebral artery occurred. We will point the radiological and histological criteria of aggressivity in osteoblastoma, and discuss the difficulties of the management of this type of lesions.

Keywords: Osteoblastoma, Aggressive, Spine, Primary spine tumor

EP-0325 [Spine and Peripheral Nerve » Spinal Tumors]

Bifocal Spinal Cord Intramedullary Cavernous Malformations: Case Report and Literature Review

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Cavernous malformations or cavernoma are hamartomas-like uncommon vascular malformations of the central nervous system characterized by abnormally dilated blood vessels with a thin endothelium without intervening normal nervous tissue. Spinal cord cavernomas are rare entity but has been reported in literature. Here, we report an extremely rare case of bifocal localization of spinal cord intramedullary cavernous malformations in the cervical and thoracic regions. A 40-year-old Arabic man, who presented with a three month history of acute cervical and thoracic pain with progressive weakness of right lower limb. Neurological examination revealed a spastic monoparesis of his right leg. Spinal cord MRI revealed two cavernous malformations at cervical and thoracic level. The patient underwent a surgical excision of the two lesions and a histopathological examination done by two different pathology laboratories revealed the features of cavernous malformation. Spinal cord intramedullary cavernous malformations although rare have a significant morbidity. It should be diagnosed early on a range of nonspecific clinical and MRI findings and then treated early.

Keywords: Cavernous malformations, Spinal cord, Bifocal localization

EP-0326 [Spine and Peripheral Nerve » Spinal Tumors]**Spinal Epidural Cavernous Hemangioma in a Pregnant Woman (A Case Report)**

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Cavernous hemangiomas are benign vascular malformations that can be located in spinal epidural space. Their management is not codified during pregnancy that constitutes a precipitating factor. A 32-year-old full-term presented a progressive spinal cord compression syndrome during pregnancy. Exploration by the MRI found an epidural vascular dorsal mass. After delivery, the surgical intervention allowed the removal of an epidural mass and histopathological examination confirmed the diagnosis of epidural cavernous hemangioma. The patient recovered well 3 weeks after surgical intervention. The spinal cavernous hemangiomas are rare malformations that can occur or grow rapidly during pregnancy due to the hormonal changes. Their prognosis is good but the timing of the surgical intervention is not codified around the pregnancy and delivery.

Keywords: Epidural mass, Cavernous hemangioma, Pregnancy, Spinal cord compression

EP-0327 [Spine and Peripheral Nerve » Spinal Tumors]**Arachnoiditis After Lumbosacral Mixopapillary Ependymoma Tumor Resection**

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A spinal tumor is a growth that develops within your spinal canal or within the bones of your spine. It may be cancerous or noncancerous. Depending on the location and type of spinal tumor, different signs and symptoms can develop. Case is 33Y/0 woman that had a spontaneous limping and movement delay with no history of trauma, after MRI and CT scan imaging Extramedullary cystic without enhancement, with explicit atrophy of spinal cord (length=75mm width=12mm) in T1 to T8 region detected, also

Lumbosacral tumoral mass lesion extension from L3 to S2 and the posterior part of vertebral bodies has scalloping defects more in L4-L5 detected, Tumor has extension neural exit foramina in L3-L5, in two steps, first surgery done in first of 2014 for the resection of arachnoid cyst and after one month lumbosacral tumor resected. There were no deficits at early post op of the second surgery but About 20 days after this surgery the patient suddenly Lower limb being plegic and urinary incontinence happen. Sensory level was hip at the acute phase. According to imaging and clinical signs the possible diagnosis was "arachnoiditis". She went under posterior ilio-lumbothoracic fixation. Incontinence gradually improved and in follow-up Sensory level gradually went lower to knees. At 2017 visit she has weak sense distal to knees specially in right leg The motor function of lower limbs is restricted to very weak movement of toes of both feet. Hypothesis for arachnoiditis is secretion of the tumor or molecular remnants of it which is poisonous to neural tissue

Keywords: Arachnoiditis, Spine, Tumor, Lumbosacral

EP-0328 [Spine and Peripheral Nerve » Spinal Tumors]**Uncommon Intradural-Extramedullary Lesions Removed by Uniportal Minimally Invasive Technique. Clinical and Radiological Results. An Study with 24 Months of Follow Up**

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Background: Intradural extramedullary cervical lesions usually cause pain or neurological deficit secondary to neural compression. Traditional treatment of these tumors includes standard fashion cut incision, open laminectomy and some cases fusion.

Method: We present four patients (one woman and three men) with symptoms include radicular pain and/or neurological deficit, due to intradural-extramedullary cervical lesion. All the patients underwent total resection with minimally invasive uniportal technique using a tree blade MAXCESS retractor system (Nuvasive, Inc). We measured a VAS, Nurick scales preop and with follow up of 6 weeks, 3, 6, 12 and 24 months postop. Surgical time, blood loss and time to discharge. All the patients were underwent control MRI postoperatively.

Results: Histologically report: One patient neuroenteric cyst, two patients: neurocysticercosis and the last: epidermoid cyst. The VAS and Nurick scales were decreased over the time line. The surgical time was 140 minutes mean, blood loss 30cc mean, All the patients were discharged 47 hours mean and return to daily activities 10 days mean.

Conclusion: Intradural-extramedullary lesions can be safely and effectively treated with minimally invasive techniques. Potential reduction in blood loss, hospitalization, disruption to local tissues and return to daily activities suggest that, this technique may present an alternative to traditional open resection

Keywords: Intradural, Extramedullary, Spinal, Tumor, Minimally invasive

EP-0329 [Spine and Peripheral Nerve » Spinal Tumors] Image-Guided and Navigation-Assisted Surgery for Primary and Metastatic Tumors of the Spine

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Background: Quality of life in patients with primary and metastatic tumors of the spine mainly depends on the surgery quality. The use of intraoperative computed tomography (iCT) and neuronavigation system in the surgical treatment of spinal tumors allows us to identify prevalence of neoplasia directly in the operating room, to oversee the resection zone and to provide spine stabilization under altered anatomy.

Method: 187 patients underwent surgical treatment for primary and metastatic tumors of the spine from January 2002 to January 2016. We used iCT with neuronavigation system since August 2013. During this period, 26 patients underwent transcutaneous biopsy as a diagnostic procedure and 45 patients underwent surgery. The aim of our study was to assess the effectiveness of iCT and navigation system in the diagnosis and surgical treatment of patients with spinal tumors of different origin and prevalence.

Results: The main advantages of iCT and navigation system use have been analyzed in the diagnosis and surgical treatment of primary and metastatic tumors of the spine. There are no any implant-related complications. In all cases extend of decompression was sufficiently. After en-bloc resection of tumor according to the control studies contrast uptake were not observed.

Conclusion: The use of iCT and neuronavigation system in the diagnosis and surgical management of primary and metastatic tumors of the spine improves the efficacy and safety of treatment under altered anatomy and the absence of external reference points and minimizes the radiation exposure.

Keywords: Image-guided surgery, Navigation-assisted surgery, Primary and metastatic tumors of the spine

EP-0330 [Spine and Peripheral Nerve » Spinal Tumors]

A Rare Case of Cervical Epidural Extramedullary Plasmacytoma Presenting with Monoparesis

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Multiple myeloma and other plasma cell disorders are characterized by production of a large number of plasma cells in the bone marrow. On the other hand, plasmacytoma results from proliferation of abnormal plasma cells in the soft tissue or skeletal system. Neurological complications are frequently observed in these diseases. The most commonly known complications among those

complications are spine fractures, spinal cord compressions, and peripheral neuropathies. Although neurological involvements are common in plasmacytomas, extramedullary spinal epidural localizations have been reported very rarely. In this case report, we aimed to present a plasmacytoma case that presented with acute onset of upper extremity monoparesis. A 40-year-old woman was admitted to our clinic with complaints of sudden weakness and numbness in her left arm following neck and left arm pain. Emergency cervical magnetic resonance imaging (MRI) revealed an epidural mass and the patient underwent emergency surgery. The patient showed improvement post-operatively and the pathology was reported as plasmacytoma. Following hematology consultation, systemic chemotherapy was initiated and radiotherapy was planned after wound healing.

Keywords: Cervical epidural, Extramedullary, Plasmacytoma

EP-0331 [Spine and Peripheral Nerve » Spinal Tumors]

Calcified Anterior Spinal Tumour Managed from a Posterior Approach and Use of Ultrasound as a Tool to Assess Surgical Resection

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A 22 year old gentleman presented with 3 weeks history of progressive lower limb weakness, MRI revealed a heavily calcified extradural cervical bony tumour. Patient was operated from a posterior cervical laminectomy approach taking the precaution to prevent acute instability. The completion of resection was well appreciated through the use of intra-operative ultrasound. Histology revealed a cartilaginous tumour of uncertain origin and awaiting further staining and reports.

Keywords: Cervical extradural tumour, Intra-operative ultrasound, Cervical laminectomy

EP-0332 [Spine and Peripheral Nerve » Spinal Tumors]

Primary Epidermoid Cyst of the Cauda Equina a Case Report

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Intraspinal epidermoid cyst is very rare, representing 0.5-1% of all spinal tumours. The cauda equina is an uncommon location. The majority of the existing literature of this condition comprises case reports with a few case series. We report the case of a 44 years old female who has been suffering from chronic lumbar pain which gave in at rest for approximately two years. During the last two months, she also complained of a weakness of both lower limbs with a retention-type sphincter malfunction. Neurological examination showed paraparesis predominantly left with abolished deep tendon reflexes and the retention of urine was objectified. Lumbar spine MRI showed an intradural and extramedullary oval tumoral formation extending from L1 to L5 with a hypointense signal in T1 and hypersignal in T2 situated posteriorly to the spinal cord and exerting scalloping. Surgery was performed and complete removal without tear of the tumor was difficult because the capsule of the tumor was adhered to the cauda equina nerve roots. Histological

examination revealed a benign epidermoid cyst. The patient's recovery was spectacular, and her symptoms disappeared with no postoperative complications. Epidermoid cyst of the cauda equina is a rare finding. Despite its location and surgery difficulties, the postoperative results are promoting.

Keywords: Primary epidermoid cyst, The cauda equina, Surgery

EP-0333 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Extradural Arachnoid Cyst

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Spinal extradural arachnoid cysts are rare lesions which typically involve the thoracic spine and is an asymptomatic condition of unknown origin. They may also produce symptoms by compressing the spinal cord or nerve roots. Surgery is the treatment of choice in such lesions but asymptomatic patients can be managed conservatively. We present a case of symptomatic, probable traumatic origin, spinal arachnoid cyst at our centre in Hospital Kuala Lumpur, Malaysia. MRI spine showed a well define, non enhancing extradural cystic lesion from T5 to T6 vertebrae level compressing spinal cord anteriorly. Patient underwent T5,T6 laminoplasty, T4 partial laminectomy and excision of cyst. Histologically, the cyst wall consist of collagen and meningotheelial cells. This surgical intervention achieved neurological improvement in terms of motor power in our follow-up review of the patient.

Keywords: Extradural arachnoid cyst, Spinal cord lesions, Paraparesis

EP-0334 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Chordoma of the Filum Terminale: Case Report

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Chordomas are rare tumors in the cranio-spinal axis arising from persistent notochordal rests commonly seen in the skull base and sacrococcygeal region. Rare cases of intradural localization are reported. A 44 year-old woman was admitted with the complaints of progressive weakness of lower limbs. Radiological examination showed an intra-dural mass attached to the filum terminale. The mass was totally removed through a L1 laminectomy and duramater opening. Pathologic examination concluded to chordoma. The authors present a case of spinal intradural chordoma and discuss the clinical, radiological features and management of such lesion.

Keywords: Chordoma, Filum terminale, Surgery

EP-0335 [Spine and Peripheral Nerve » Spinal Tumors]

Defining the Nature: How Can a Benign Spinal Schwannoma Transform into a Malignant Deadly Disease?

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Spinal schwannomas are the most common intradural extramedullary spinal tumors and locate electively in the cervical or the lumbar spine. A malignant transformation of a benign spinal schwannoma rarely occurred. We report an exceptional case of malignant transformation of a benign schwannoma arising in the thoracic spine of a 31-year-old man without previous history of Recklinghausen disease. The patient presented to our emergencies with signs of spinal cord compression for the past four months. Physical examination revealed spastic para paresis with T7 sensory level. MRI of the spine revealed a solid well-defined intra-extra foraminal lesion at the D7 level with low T1, high T2 signals, and strong contrast enhancement. A subtotal tumor removal was achieved via a posterolateral approach and the final histological diagnosis was a benign schwannoma. The patient was readmitted 4 months later for secondary aggravation. Imaging investigation showed local recurrence but with massive D7 vertebral body destruction. Surgical biopsy was obtained confirming the malignant transformation and further screening revealed mediastinal and pulmonary metastases. The patient died one month later from cardiac failure. He was undergoing adjunctive radiation therapy. Although the malignant transformation of a benign spinal schwannoma is exceptional, a careful follow-up should be indicated to detect on time such unfortunate events.

Keywords: Spine, Schwannoma, Malignant transformation, Surgery

EP-0336 [Spine and Peripheral Nerve » Spinal Tumors]

Extramedullary Hematopoiesis: An Unusual Cause of Spinal Cord Compression

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Extramedullary hematopoiesis is an offsetting process observed in hemoglobinopathies. It is commonly seen in the spleen and liver. Spinal canal location is extremely rare. We describe three cases of spinal cord compression due to extramedullary hematopoiesis treated in the neurosurgery department of Fattouma Bourguiba Hospital during the last ten years. All patients were males, aged respectively of 19, 21 and 33 years. All of them had history of thalassemia intermedia. On examination, signs of spinal cord compression were present in all cases with dorsal pain, weakness in lower limbs, urinary disturbance, and sensory spinal level (T6, T7 and T8 respectively). Laboratory tests showed hemoglobin counts of 5.4g/l, 6.4g/l and 8.9 g/l. On MRI, the youngest patient had both thoracic and sacral masses lesion while the two others had only thoracic epidural masses. All patients were surgically treated and received several blood transfusions. Full recovery was observed in all cases. Beta-thalassemia is a common Mediterranean hemoglobinopathy. It may be responsible, because of the chronic anemia, of spinal cord compression due to extramedullary hematopoiesis. Surgical decompression is usually associated with remarkable recovery.

Keywords: Spine, Extramedullary hematopoiesis, Spinal cord, Compression, Surgery

EP-0337 [Spine and Peripheral Nerve » Spinal Tumors] Surgical Treatment Outcomes of Cervical Ependymoma: Experience of 12 Cases

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Background: Spinal ependymomas account for about 23% of intradural lesions in adults. Subtotal resection is observed in up to 44% of intramedullary ependymomas despite their usually well-circumscribed growth pattern. In this study long-term surgical treatment outcomes of our 12 cases of cervical ependymoma have been evaluated.

Method: Medical records were retrospectively reviewed in cervical tumors who operated between the years 2004 and 2015, and the cases which confirmed as ependymoma pathologically were obtained in this study.

Results: 12 (9 women and 3 men) patients. The mean age was 34.3±7.9(22-54) years. The mean follow-up period was 87.8±51.7(30-162) months. The most common complaints were radicular pain (upper extremities pain) (75%). All cases were intramedullary, and no one with multifocal presentation. Two cases (16.7%) showed recurrence after 3 months and 3 years. The mean of prodrome was 18.15±23.5 (1-84) months. The mean length of hospital stay was 8.6±10.6 (2-64) days. The complications included 2 epidural hematoma were reoperated; the first patient had lost whereas the second one sent to the physical therapy and rehabilitation, 2 patients were experienced worsen motor deficits and one had surgical site infection. The choice of approach was posterior in all cases. Gross-total resection was achieved in four patients. Histologically, all cases were WHO Grade II.

Conclusion: The cervical cited ependymomas almostly seen in females (3:1). In our series the most difficult surgical intervention was achieved in cervical ependymomas. 23% of our ependymoma cases were cited in cervical Postoperative MRI controls should be done especially of those experience local or radicular pains.

Keywords: Spinal ependymoma, Intradural-intramedullary, Gross-total resection, Laminoplasty, Neurophysiological monitoring

EP-0338 [Spine and Peripheral Nerve » Spinal Tumors] Enhanced Patient Safety in Spinal Surgeries, Understanding the Cutting Edge Neurophysiology Modalities

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Iatrogenic paraplegia from spine surgeries has been a major concern for surgeons around the globe. Preventing such complications is

pivotal and Intra-operative neuro-electrophysiology (IOM) serves to help such patients with successful surgeries and better post-op outcome. Better outcome can be achieved using following IOM modalities.

Somatosensory-Evoked Potentials (SSEPs)/Trans-cranial-Motor-Evoked Potentials (TcMEPs)/ Electromyograms(EMGs)/Triggered-Electromyograms (TEMGs/screw stimulation). In Spinal cord tumors, other extremely important modalities include Direct (D)Waves/Spinal-cord mapping, while nerve roots mapping is recommended in surgeries in the Cauda Equina. Neurosciences community around the globe aren't well trained or experienced enough to perform/interpret neuro-electrophysiology data resulting in lack of or improper use of relevant modalities in a particular surgery. Spinal cord tumor surgeries, especially Intra-medullary tumors must be done with both TcMEPs & D-waves or spinal-cord mapping for maximum and safe resection besides SSEPs.

Spinal instrumentation surgeries similarly must be monitored with both SSEP and TcMEPs. Neuro-electro physiologists must make sure to include important lower limb muscles to be a part of their protocols. Anal Sphincter monitoring must be added in all Conus and sacral surgeries. Electrophysiology data changes caused by anesthetic or systemic changes must be read well and not interpreted as surgical changes to prevent false alarm. In tethered cord surgeries, while identifying Filum, care must be observed to suggest separation of rootlets not infrequently attached to filum and that can be easily identified with vigilant Sphincter EMG monitoring.

Comprehensive multimodality neuro-electrophysiology monitoring is the key to a successful post-operative favorable outcome in all spinal surgeries.

Keywords: Intra-operative neurophysiology, Spinal cord monitoring, Sensory and motor evoked potentials

EP-0339 [Spine and Peripheral Nerve » Spinal Tumors] Multiple Cervical Neurofibromas with Myelopathy in a Patient with Neurofibromatosis Type 1 A Case Study, Technical Note and Review of the Literature

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Neurofibromatosis type 1 (NF1) is a common autosomal dominant disorder in which affected individuals develop multiple tumors. Spinal NF are found in up to 38% of NF1 patients; however, clinical implications are reported in only about 5% of them. Cervical neurofibromas with myelopathy pose challenging management problems, because of neural compression, multiplicity of tumors, involvement of multiple nerves, engulfing adjacent vascular and visceral structures and the need for extensive laminectomy with risk of instability. Available data in literature are scarce. We are presenting a 22-year-old male who was newly diagnosed with NF type 1. He presented with progressive cervical myelopathy over 12 months secondary to multiple cervical neurofibromas. Patient was bed ridden for 6 months prior to surgery. MRI revealed a multiple intradural extramedullary cervical neurofibromas from C2 to C6 causing a compression on the spinal cord, with multiple intraforaminal lesions at thoracic and lumbar spine. The patient

underwent cervical decompression and fusion and debulking of intradural part of multiple neurofibromas with expansile duroplasty. Post operatively there was transient weakness in C5 and C6 muscle groups bilaterally. The patient sustained gradual improvement of weakness and spasticity. At 3 months F/U the patient was mobilizing without assistant, with minimal residual weakness in right biceps. We presented a challenging case of sever progressive myelopathy secondary to multiple bilateral cervical neurofibromas in patient with NF 1, which was treated with laminectomy, fixation, debulking of the tumor, expansile duroplasty with satisfactory outcome. Technical nuances and review of literature are presented.

Keywords: Neurofibromas, Tumor, Spine, Myelopathy, Decompression, Fusion

EP-0340 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Cord Compression in Multiple Myeloma: Seven Case-Reports and Review of Literature

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Background: Multiple myeloma, a malignant plasma cell disorder is the most common primary tumor of the spine. Spinal cord compression in multiple myeloma is a rare condition, which its therapeutic approach and clinical results have been reported to be diverse, without any clear guidelines.

Method: Clinical and neuroradiological findings were retrospectively collected in Neurosurgery department, of CHU Habib Bourguiba, Sfax, Tunisia between 2010 and 2013.

Results: Seven patients were included (6 males, 1 female). Mean age at onset of symptoms was 58 years. We found lambda light chain multiple myeloma in 5 cases (IgG 2 cases, IgA 1 case, IgM 1 case, IgD 1 case) and Kappa light chain multiple myeloma (IgG) in 2 cases. Spinal cord compression was revealed by progressive paraplegia in 5 cases with bladder dysfunction in 3 cases. Sensitif trouble was the prominent feature in the two other cases. Spinal cord compression location was dorsal (4 cases), lumbar (2 cases) and cervical (1 case). All patients underwent chemotherapy associated to laminectomy in 4 cases and radiotherapy in 4 cases. Total improvement was obtained in 5 cases while stabilization was noted in 1 case. One patient was dead because of an infectious complication.

Conclusion: Optimal therapeutic strategy for spinal cord compression as one of devastating complications of multiple myeloma is still under debate. However, diagnosis and treatment must be carried out rapidly in order to avoid a permanent sensitive or motor defect.

Keywords: Multiple myeloma, Spinal cord compression, Chemotherapy, Laminectomy, Radiotherapy

EP-0341 [Spine and Peripheral Nerve » Spinal Tumors]

Relapsed Intramedullary Epidermoid Cyst: Case Report and Literature Review

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Epidermoid cysts are benign slow growing tumor, almost always congenital, resulting from aberrant inclusion of ectodermal elements during neural tube closure, between the 3rd and 5th week of embryonic development. We report a case of an intramedullary epidermoid cyst which relapsed and discuss the etiology, epidemiology, clinical, radiological features and neurosurgical treatment. A 12 years' old patient with a history of 02 interventions for intramedullary epidermoid cyst was admitted for a gradual increase in the deficit of the lower limbs, sensory, with sphincter disorders. The magnetic resonance imaging (MRI) medullary objectified an intramedullary recurrence of from D12 to L4. The patient was operated. The intraoperative appearance showed the presence of hair with keratin, otherwise there was a gang of arachnoiditis sheathing the root of the ponytail making removal very difficult. Histological examination confirmed the diagnosis of epidermoid cyst. The postoperative follow were marked by a clinical stabilization. The patient was referred for rehabilitation after discharge with good long term evolution. The incidence of squamous spinal cysts all ages combined is estimated at 0.9% of all tumors intra spine; the seat intramedullary is rarer Although these tumors are generally good prognosis recurrence poses a challenge to the surgeon. Epidermoid cysts are rare benign tumors exceptionally intramedullary. The diagnostic approach is established by magnetic resonance imaging and neurosurgical treatment. The prognosis is generally good.

Keywords: Relapsed, Epidermoid cyst, Arachnoiditis, Intramedullary

EP-0342 [Spine and Peripheral Nerve » Spinal Tumors]

Epidural Lumbar Hematoma Revealing a Primary Spinal Burkitt's Lymphoma

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Burkitt's Lymphoma (BL) is a small non-cleaved B-cell lymphoma, which is characterized by rapid progression and is endemic in tropical regions. Spinal BL without evidence of other system involvement is extremely rare. We present a case of spinal cord compression by Burkitt's lymphoma and discuss ethiopathogeny and treatment modalities. A ten-years-old child with a history of mild lumbar trauma two weeks before admission, presented to the emergencies with a cauda equina syndrome and severe lower back pain. On examination, flaccid paraplegia (at 1/5) with urinary retention and a kyphotic attitude of the lumbar spine were noticed. MRI discovered a spinal cord compression from L1 to L4 from an epidural hemorrhagic process without abdominal or thoracic organ involvement. Spinal decompression with complete tumor removal was performed, completed with chemotherapy after histologic diagnosis of BL along with physiotherapy. Outcome after one year is good with almost complete recovery. BL usually localized in abdominal region; spinal involvement with cord compression occurs in late stage of the disease. Primary spinal compression without other organ involvement is very rare and its physiopathology is unclear with four different theories. On MRI it appears like a dumbbell-

shaped lesion. Bleeding is quite unusual and worsens the clinical presentation. Urgent spinal cord decompression with chemotherapy warrants a relatively good outcome. Acute Spinal cord compression from a BL is a rare mode of presentation. Adequate treatment teaming up surgery, physiotherapy and chemotherapy gives best chances of recovery.

Keywords: Burkitt's lymphoma, Spinal cord compression, Epidural, Epidural hematoma

EP-0343 [Spine and Peripheral Nerve » Spinal Tumors] Idiopathic Epidural Lipomatosis: A Rare Cause of Cauda Equina Syndrome

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Spinal epidural lipomatosis (SEL) is a rare condition in which there is an abnormal accumulation of fat in the epidural space. It is often described in patients suffering from endocrinopathies or receiving chronic steroid therapy. Cauda equina syndrome is an uncommon complication of this pathology. Authors reviewed radiological characteristics and discuss therapeutic modalities of SEL. A non-obese 36 year-old male without medical history and no concept of taking steroids, presented with sudden development of motor weakness in his lower extremities. For one year, he had experienced lower back pain associated to bilateral lumbo sciatica. Spinal magnetic resonance image (MRI) showed lumbar epidural fat compressing. The patient was operated. Urgent laminectomy and decompression with removal of epidural fat showed improvement of clinical signs.

Keywords: Cauda equina syndrome, Epidural lipomatosis, MRI

EP-0344 [Spine and Peripheral Nerve » Spinal Tumors] Isolated Intramedullary Spinal Rosai-Dorfman Disease: A Case Report and Literature Review

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Rosai-Dorfman disease (RDD) is a rare histioproliferative disorder that only occasionally involves the central nervous system (CNS). We presented the diagnosis and treatment of an exceedingly rare case of isolated intramedullary spinal RDD which was only reported for 3 times. The patient was treated by total surgical resection and experienced no recurrence during the 12-months follow-up. Histopathological examination showed a characteristic emperipolesis, the lymphocytes were engulfed in the S-100-protein-positive histiocytes with negative expression of CD1a. Preoperative diagnosis of spinal RDD is still challenging because the lesion is usually a dura-based lesion that mimics a meningioma. Surgical resection is an effective treatment and radiotherapy, steroid and chemotherapy has not demonstrated reliable therapeutic efficiency.

Keywords: Rosai-Dorfman disease, Diagnosis, Treatment

EP-0345 [Spine and Peripheral Nerve » Spinal Tumors] Neuromonitoring During Spine Surgery, Almaty (Kazakhstan) Experience

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Background: The use of intraoperative neuromonitoring (IOM) helps surgeon to detect and to prevent the damage of the nervous structures. The purpose of the study is to show our experience of using IOM during the spine operations.

Method: In this research analyzed clinical cases (2015-2016 yy) of spinal pathology at the Department of Spine Neurosurgery in the City Clinical Hospital №7 of Almaty. IOM conducted during operations: microsurgical removal of spinal cord tumors, transpedicular fusion. The following type of IOM has been used: transcranial motor evoked potentials (stimulation with 300-350 mA), somatosensory evoked potentials (with 10-12 mA). Spinal cord monitoring controlled the proximity of the nerve root, the conduction of spinal cord and during the fusion - accurate placement of pedicle screws.

Results: A total of 35 patients were operated: twenty-five spinal cord tumor resection, ten transpedicular fixation. Age of patients was 29-73 years old. According to nosology all patients were distributed in the following way: degenerative diseases of the spine-8, vertebral fractures-2, extramedullary tumors-21 (meningiomas-12, neuromas-9), intramedullary tumors-4. Damage of the nerve structures was observed at the levels: cervical-14,2% (5 patients), lumbar-37,1% (13), thoracic-48,6% (17). In the early postoperative period there was no worsening of neurological deficits. Pain stopped in 85% cases, improvement of motor function-in 47 to 91%, depression of neurological dysfunction of pelvic organ in 80%, regression of myelopathy syndrome-77%. Saving neurological deficit on pre-operational level was in 2 patients (5,7%).

Conclusion: Application of IOM improves clinical outcomes of operations, through the timely prevention of neurological deficits.

Keywords: Spine surgery, Spinal meningioma, Spine intradural neuroma, Spinal cord neuromonitoring, Somatosensory evoked potentials, Motor evoked potentials

EP-0346 [Spine and Peripheral Nerve » Spinal Tumors] Sensitivity and Specificity of "Mini Brain" Image Pattern to Diagnose Multiple Myeloma and Plasmocytoma

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Background: Multiple myeloma and plasmocytoma are frequent causes for spinal lesions. Although there are typical clinical findings, image pattern may be similar to other causes. It has been proposed that the "mini brain" aspect in MR is highly suggestive of multiple myeloma or plasmocytoma. Our objective was to determine sensitivity and specificity of such finding in a cohort of patients and perform review of literature.

Method: We reviewed our medical files of patients with multiple

myeloma. The study sample consisted of patients consecutively diagnosed with vertebral involvement of MM/plasmocytoma evaluated in the Neurosurgery service of Hospital do Servidor Público Estadual de São Paulo (HSPE) from January 2014 to January 2016.

Results: After literature review and patient evaluation, we found a sensitivity of 80%, however other diagnosis should be eliminated, such as discitis and fracture.

Conclusion: Mini brain is suggestive of multiple myeloma.

Keywords: Multiple myeloma, Spine, Tumors

EP-0347 [Spine and Peripheral Nerve » Spinal Tumors] Vertebroplasty in Metastatic Thoracolumbar Spine Disease Regarding Pain Relief

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Background: Percutaneous vertebroplasty is a minimally invasive technique used for treatment. The aim of this study is to discuss the rule of vertebroplasty in treatment spinal metastasis of thoracolumbar region regarding pain relief.

Method: This is a retrospective study of 14 cases of metastatic spinal disease of thoracolumbar region operated between February 2012 to mai 2015, all cases subjected to percutaneous vertebroplasty, follow up period ranged from 2 to 6 months, pain intensity was scored on visual analogue scale (VAS).

Results: 12 patients (85.7%) of our study showed significant pain improvement within 48 hours of the procedure, at 6 months follow up of 10 patients (71.4%) had persistent pain relief.

Conclusion: Vertebroplasty is an effective and less invasive procedure in reducing pain in patients with metastatic spinal disease of thoracolumbar spine.

Keywords: Vertebroplasty, Spinal metastasis, Thoracolumbar

EP-0348 [Spine and Peripheral Nerve » Spinal Tumors] Prognostic Factors Affecting Surgical Outcomes of Cervical Spinal Cord Ependymomas

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Background: Spinal cord tumors represent 10% to 15% of central nervous system (CNS) neoplasms. In adults, two thirds of these tumors are extramedullary and the remaining third are intramedullary. We aimed to outline the prognostic factors that affect the surgical outcomes of cervical cord ependymomas.

Method: Twenty one patients with cervical spinal cord ependymoma underwent surgery between 2009 and 2014. The neurological status before surgery, 1 month after and at the last follow up were assessed with McCormick scales.

Results: Surgical resection was total in 12 patients, subtotal in 6 patients and partial in 3 patients. Preoperative neurological deficits improved in nine patients, did not change in five patients, and deteriorated in six patients. One patient died due to pulmonary embolism after 1 week. Eight patients had complications (38.1%). We found a significant correlation between the pre-operative state and the final functional outcome (P=0.043). There was statistically

relevant correlation between the recurrence rate and the degree of resection (P=0.012).

Conclusion: Cervical spinal cord ependymomas can be treated safely and effectively by surgery with an acceptable morbidity and mortality. Total resection must be the essential aim. Preoperative neurological state, and degree of resection are the most important factors that affect the final functional outcome.

Keywords: Outcome, Spinal cord ependymoma, Intramedullary tumor

EP-0349 [Spine and Peripheral Nerve » Spinal Tumors] Epidemiological Characterization of Vertebral Metastasis in a Reference Hospital in Neurosurgery

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Background: The spine is the most common site of bone metastasis (70% in the thoracic spine) and 2.5% probability of an oncologic patient developing at least one episode of medullary and / or equine compression in the 5 years preceding his death. Background: To determine the epidemiological profile of patients with vertebral metastasis in a tertiary hospital.

Method: Retrospective and descriptive study with a quantitative approach of data from 24 medical records of hospitalized patients with vertebral metastasis, from January 2013 to March 2016. Data were collected from a standard form and organized in Microsoft Excel 2007 worksheet.

Results: Higher prevalence in women above 60 years old, 58.33% of the cases (n = 14). The topography: 70.83% (n = 17) in the thoracic portion, 19.04% (n = 4) lumbosacral, 16.67% (n = 4) cervical and 9.52% (n= 2) multiple metastasis. The primary sites were lung (4 cases), prostate, breast, multiple myeloma and indefinite site (3 cases each), vesicle and intestine (2 cases each) and renal and pancreas cells (1 case each). According to the modified Frankel scale, 38.10% entered classified as A, with pain as the main symptom. Surgical treatment was instituted in 22 cases. Complications were: urinary tract infection (42.86%), deep vein thrombosis (29.17%), pneumonia (25%) and sepsis (33.33%).

Conclusion: The histological type of cancer is a predictive factor regarding the possibility of spinal metastasis and spinal cord compression. Diagnosis and early intervention prevents sequel and improves quality of life for cancer patients.

Keywords: Vertebral metastasis, Epidemiology, Spine

EP-0350 [Spine and Peripheral Nerve » Spinal Tumors] Solitary Plexiform Neurofibroma of the Lumbar Spine: A Case Report

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Neurofibromas (NF) are benign tumors of neural origin. They are classified into cutaneous, subcutaneous, and plexiform subtypes. Plexiform neurofibromas are the least common variant and usually are pathognomonic for NF 1 (von Recklinghausen disease). Only a few cases are described on literature for solitary spinal neurofibroma. Here we present a case of solitary PN of the lumbar spine, which was not associated with NF 1. A 45-year-old female, from 2 months with back and bilateral leg pain. From 3 weeks with progressive paresthesia. The patient underwent 2 different surgery. First surgery with posterior approach, a total L3 laminectomy and bilateral pediclectomy with excision of the posterior part of the tumor and posterior L1-L2-L4-L5 arthrodesis was performed. After 1 month the second surgery with anterior trans-abdominal approach, total L3 corpectomy with total tumor excision and anterior L2-L4 fixation was performed. Histological examination demonstrated characteristic histological findings of hypocellular myocoid tissue without atipic cells. Immunohistochemical analysis showed that the tumor cells were positive for S-100 protein (+++) Vimentin (+) CKMNF (+), but negative for CD45, CD68, KI-67, CK7, CK20, Desmin and actin. Based on histological and Immunohistochemical findings, the case was confirmed as PN.

Keywords: Plexiform neurofibroma, Lumbar, Surgery

EP-0351 [Spine and Peripheral Nerve » Spinal Tumors]

Late Posterior Stabilization of a Patient with Ewing Sarcoma of First Thoracic Vertebra

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Primary Ewing sarcoma of the spinal column is rare. We would like to present a patient that underwent multilevel laminectomy and was left unfixed for seven months. A seven-year-old boy was admitted to our hospital with the diagnosis of Ewing sarcoma of the thoracic first vertebra. He previously had undergone cervical 6 and 7 laminectomy and thoracic 1 and 2 laminectomy. From his history, we learned that he was advised to stay immobilized in bed for seven months and no further surgical intervention was planned for the patient. Following his chemotherapy and radiotherapy, patient was evaluated for the control of the tumor and his progressive kyphosis at his back. The afflicted vertebra seemed to have recovered on MR images, but there were the signs of instability and his posture was impaired. He had dorsalgia. Surgical stabilization was considered for him. We performed posterior stabilization involving the cervical 5 and 6, and thoracic 2 and 3 vertebrae. Child's pain relieved gradually, and he was totally mobile thereafter. At his second year follow up screening, spinal column was tumor-free, but tumor infiltration in his sacroiliac bone was discovered. He was referred to the pediatric oncology department. Although Ewing sarcoma is radiosensitive and may respond to chemotherapy, in order to prevent progressive kyphosis deformity in a growing child, stabilization of the spine should be considered if you plan to just perform total multilevel laminectomies.

Keywords: Ewing sarcoma, Spinal tumor, Posterior stabilization, Pediatric tumor, Spinal deformity

EP-0352 [Spine and Peripheral Nerve » Spinal Tumors]

Surgical Treatment of Spinal Cord Intramedullary Tumors in Adult

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Background: Incidence of intramedullary tumors is much lower compared to brain intraparenchymal tumors. Surgery of spinal intramedullary tumors has own tricks during approach and removing process. Burdenko Neurosurgical Institute has a well-established practice of intramedullary tumors surgical treatment.

Method: Burdenko Neurosurgical Institute has treatment experience for more than 1000 patients with spinal intramedullary tumors of all ages. This research reports results of spinal department for treatment of 385 adult patients with spinal intramedullary tumors between 2000-2016 year. We identified following histological types: ependymomas, astrocytomas, hemangioblastomas and other types. All patients underwent microsurgical tumor resection with ultrasound suction device and electrophysiological monitoring application. In some cases, we used metabolic navigation from 5-aminolevulinic acid to precisely identify the borders of astrocytomas (Grade II, III, IV). This allowed resecting tumors more radically with minimal postoperative deficits. Novalis and Cyber Knife were used as a treatment options for some patient. McCormick scale was used for evaluation neurological status.

Results: Histological distribution: 57% – ependymomas, 18% – astrocytomas, 35 10% – hemangioblastomas, and 15% had other histological type of tumors (cavernous malformation, glioblastomas, cancer metastasis and other). Follow-up was one year, and the post-surgery recovery period took 3 to 6 months. Among 320 patients under analysis, 33% showed some neurological improvement, 51% had no change, and 16% showed neurological deficiency.

Conclusion: Using technology of metabolic navigation and electrophysiological monitoring simultaneously allows for more radical resection of spinal intramedullary tumors with less complications. Radiosurgical treatment of intramedullary tumors allows preventing recurrence.

Keywords: Surgery, Intramedullary tumor, Adult, Metabolic navigation, Electrophysiological monitoring

EP-0353 [Spine and Peripheral Nerve » Spinal Tumors]

Schwannomatosis of Lumbar Spine

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Though multiple schwannomas occurs usually with Neurofibromatosis 2 cases, a different syndrome of schwannomatosis defined in the last years. This case report aim to present a rare case of spinal schwannomatosis. A 35 year old man presented with

low back pain and left leg pain for 2 months. The patient had no sign or symptoms of Neurofibromatosis and family history. The neurological examination revealed sensory deficit over the L3 and L5 dermatome with no motor deficits. General examination did not reveal any skin lesions. MRI showed 3 distinct intradural masses at the L3, L5, S1 levels; hypointense at T1 and hyperintense at T2. The patients underwent surgery with L3 and L5 total laminectomy and S1 hemilaminectomy. The lesions totally removed. The patient discharged without deficit. The pathology diagnosed the lesions as schwannoma. The patient genetic test consulted different laboratory. Multiple spinal schwannomas may occur as a part of Neurofibromatosis 2 or schwannomatosis, each having different clinical, radiological and genetic features.

Keywords: Lumbar, Neurofibromatosis 2, Schwannomatosis, Spine

EP-0354 [Spine and Peripheral Nerve » Spinal Tumors]

First Report of Intradural Extramedullary Capillary Hemangioma in the Upper Cervical Spine

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The occurrence of intradural extramedullary capillary hemangiomas is exceedingly rare. To date, only 39 cases of intradural extramedullary capillary hemangiomas have been reported in the English literature, and all of these cases have been described at the lumbar and thoracic spinal levels. To our knowledge, this report is the first case of capillary hemangiomas of the cervical spine in the literature. In general, this entity is misdiagnosed preoperatively as a neoplasm. A 29-year-old man presented with neck pain and progressive gait disturbance, and was diagnosed with an intradural extramedullary capillary hemangioma in the cervical region. Although rare, our case demonstrates that capillary hemangioma should be considered in the differential diagnosis of intradural extramedullary tumor of the cervical spine.

Keywords: Capillary hemangioma, Cervical spine, Extramedullary, Intradural

EP-0355 [Spine and Peripheral Nerve » Spinal Tumors]

Giant Intra-Thoracic Schwannoma: About 2 Cases

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The Giant intra thoracic schwannoma is a rare pathology and has a polymorphous semiology. Its diagnosis is made with the spinal MRI which remains the gold standard neuroradiological. The best treatment remains surgery, but has limitations in case of schwannoma infiltrating neighboring structures. We report two cases revealed by a chronic basi-thoracic pain syndrome with none associated respiratory signs. The symptom was insidious in all cases with a clinical mutilated classic and extreme discretion of the symptoms despite the very large volume of the tumor. It dominated

by spinal syndrome and deficit spastic pyramidal syndrome. We performed an anterolateral approach. The surgical excision was conducted in block. The evolution was favorable in all cases marked by a total recovery of the neurological deficit after an average of three months for the first patient and 02 weeks for the second.

Keywords: Spinal syndrome, Spastic pyramid syndrome, Giant intra-thoracic schwannoma, Anterolateral approach, Total recovery of neurological deficit

EP-0356 [Spine and Peripheral Nerve » Spinal Tumors]

Our Experience Use of Percutaneous Puncture Vertebroplasty for Multiple Vertebral Body Damages

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Aim: To analyze the results of percutaneous treatment with the method of vertebroplasty of patients with multiple vertebrae body damages.

Method: There were examined and operated by the method of vertebroplasty 85 patients. All the patients were made comprehensive pediatric, clinical, biochemical, x-ray, CT, MDCT, MRIs. Tumors of the vertebra in 45 cases, osteoporotic fractures in 20, traumatic fractures in 10, posttraumatic osteonecroses vertebra in 10. Under C-arm control under the needle of bone cement produced all percutaneous puncture vertebroplasties.

Results: Hemangioma of two levels in 22 cases, of three in 6, of four and more in 2; myeloma of two levels in 4, of three or more in 4; metastatic damage vertebra of two levels in 5, three or more in 2; osteoporotic fractures of two levels in 5, of three in 6, of four and more in 9; traumatic compression fractures of two levels in 7, of three or more in 3; post-traumatic body osteonecroses of two levels in 6, of three in 4. The analysis of the results of vertebroplasty is made by clinical pain scale of Gaughen. Before the surgery the unbearable pain was in 10 patients, preoperative intensity of pain syndrome in 8.4 ± 1.5 , postoperative in 2.1 ± 6.6 ; bed-days in 1.7 ± 0.2 .

Conclusion: Percutaneous vertebroplasty on the testimonies in diseases of the spine is a minimally invasive method that reduces the severity of pain on 75.2 per cent, reduces the number of bed-days on 1.7.

Keywords: Vertebral fracture, Percutaneous treatment, Vertebroplasty

EP-0357 [Spine and Peripheral Nerve » Spinal Tumors]

Unilateral Approaches for the Removal of Spinal Intradural Tumors: Review and Proposed Classification

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Aim: To compare effectiveness of different unilateral approaches (UA) in protection of spinal stability postoperatively, the borders of bone removal should be defined accurately. However, such terms as "UA" or "minimally invasive" lack precise description of the borders of bone removal.

Method: We reviewed the available literature focused on the borders of bone removal in UAs for the removal of intradural spinal tumors and proposed classification of UAs.

Results: Anatomical margins of bone removal were described insufficiently in the most of the published articles. Use of the following classification of UAs can be beneficial. Type 1: Unilateral partial hemilaminectomy (UPH) without drilling of the medial facet or the spinal process including its base (quadrantectomy). Type 2: UPH with drilling of the base of spinal process, no drilling of the medial facet Type 3: UPH with drilling of the unilateral facet joint, no drilling of the spinous process Type 4: Unilateral hemilaminectomy with drilling of the unilateral facet joint and substantial part of spinous process Type 5: Unilateral hemilaminectomy with drilling of the unilateral facet joint and the entire spinous process Type 6: Drilling of the entire spinous process and the contralateral hemilamina with or without drilling of the facet joints (similar to traditional total laminectomy). Type 7: Other non-classified rare techniques, such as so called bridging hemilaminectomies, hemilaminotomy with reinsertion of the bone etc.

Conclusion: Use of a classification for UAs can be beneficial in comparison of the effectiveness of specific UAs in postoperative protection of spinal stability.

Keywords: Classification, Unilateral approach, Spinal intradural tumor, Spine anatomy

EP-0358 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Tumors: Surgical Particularities

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Osteoblastomas are rare benign primary bone tumors. They account approximately 3% of benign and 1% of primary bone tumors. Pathology of the young subject (adolescent or child). Clinical signs are dominated by pain that disrupts at this age the patient's daily life and Schooling. We report two cases of lumbar osteoblastomas in young patients with a low back pain as a common presentation. The diagnosis by using the Technetium bone scan allow a precise localisation of the tumor. The surgery involve total resection guided peroperatively by nuclear probe detection. Modern imaging and collaboration with nuclear physicians allow clear investigations. In the two cases surgical planning with per operative control of the tumor-site guided a complete removal. The mean follow up is 5 years. Advantages are the interest of the two cases is the support of the radiodetection preoperatively to confirm the total removal of the tumor. The result is to confirm during the intervention that there is no residual tumor that can be a source of recurrence. Disadvantages are the need to perform bone scintigraphy the day before surgery and to operate the patient with a short delay for better intraoperative detection. We believe that there is no significant risk of irradiation.

Keywords: Bone tumors, Technetium, Osteoblastoma

EP-0359 [Spine and Peripheral Nerve » Spinal Tumors]

A Case of Sacral Myxopapillary Ependymoma, Which was Initially Diagnosed as a Chordoma

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Primary malign sacral tumors such as chordomas, sarcomas, and lymphomas are rare. The presented case emphasizes that histopathological diagnosis of the tumor might lead to a more conservative resection of the tumor. Myxopapillary ependymoma is usually located in the caudal end of the spinal cord at the terminal filum and cauda equina. But it may rarely emerge as the primary sacral tumor outside the thecal sac among other primary malign tumors of the sacral region. Here we present a case of a 32-year-old woman who had sacral myxopapillary ependymoma that was pre-diagnosed as sacral chordoma. Therefore, extent of surgical resection was established on an invasive malign primary tumor of the spinal column. She presented with intractable pain in her groins. She underwent en bloc resection to provide better survival to the patient by totally resecting the chroma. Thecal sac was traversed below the S2 root section. Thus she became clean intermittent catheterization (CIC) dependent. Histopathology revealed myxopapillary ependymoma as the final diagnosis of the patient. However, resection involved total sacrectomy and scarification of the thecal sac below S2 roots. A preoperative diagnosis of ependymoma with a needle biopsy could probably save the bladder functions of the young patient. Nevertheless, intraoperative frozen-section histological assessment should be performed to guide the extent of surgical resection.

Keywords: Sacral tumor, Myxopapillary ependymoma, Sacral chordoma, Needle biopsy

EP-0360 [Spine and Peripheral Nerve » Spinal Tumors]

Intra-Extradural and Intra-Extramedullary Lumbar Ependymoma Case

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Background: Intramedullary tumors constitute 5% of spinal tumors. Ependymomas constitute 30% of intramedullary tumors. About 27% of spinal ependymomas are myxopapillary ependymomas. They are most commonly found distal to the spinal cord, conus medullaris and filum terminale. About 50% is seen at the filum level. It is a papillary and contains microcytic vacuoles, mucoid and connective tissue. We would like to present the intra and extramedullary course of intramedullary myxopapillary ependymoma.

Case Report: Lumbar pain was the main complaint of a 21-year-old male patient who presented with both leg pain complaints, and he was operated on because of a lumbar mass 5 years ago and his pathology was reported as ependymoma grade 2. Cystic tumoral

lesion was detected in the spinal canal during the examination of the patient. The patient was operated in our institution. It was observed that posterior elements at the lumbar 1 and 2 level of the patient were defective during the operation. It was observed that there was a dura defect and purple colored soft tissue was protruding from the dura. Intradural-extradural, extramedullary and intramedullary parts were resected using intraoperative neuromonitoring, and histopathological examination was reported as myxopapillary ependymomas. The patient received 30 sessions of radiotherapy. Neurological deficit was not detected in the control examination of the patient.

Conclusion: Surgery is the routine treatment of myxopapillary ependymoma. Along with developing technology and intraoperative neuromonitoring, total or near-total excision of the masses is possible. Radiotherapy can be added after surgical treatment.

Keywords: Ependymoma, Myxopapillary, Spinal, Tumor

EP-0361 [Spine and Peripheral Nerve » Spinal Tumors]

Results of Surgical Treatment of Spinal Cavernous Malformations

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Background: Cavernous malformations of the spinal cord present a rare vascular pathology. Cavernous malformations can arise sporadically on various levels of the spinal cord. The spectrum of clinical manifestations of these pathologies is quite wide – from asymptomatic carriage to severe neurological deficit that lead to permanent disability or death of the patient.

Method: From 2002 to 2016 Burdenko Neurosurgery Institute treated 55 patients with cavernous malformations on various levels of the spinal cord. Those included 46 intramedullary cases, 4 extramedullary ones, 3 intradural ones and 2 extradural cases. Retrospectively, there were examined 19 patients with cavernous malformations of intramedullary location. The diagnosis is based on MRI data and neurological examination. The patients were assessed on a McCormick classification part of preoperative and postoperative treatment.

Results: The average age of the patients with cavernous malformations was 39 (17-76 years old). The average duration of symptoms was 8-9 months, with the follow-up period of 4-6 months. The average size of tumors ranged from 0.4 to 1.2 cm. The average removal time was 1.0 to 3.5 hours and the average intraoperative blood loss was 130-300 ml. On the first day after the surgery one patient developed intradural hemorrhage after removal of the intramedullary hemorrhage.

Conclusion: Surgery of vascular tumors of the spinal cord is a sophisticated and multicomponent task that requires a search for the correct approach to treat the patient, a decision made on the need for embolization of vascular tumor, as well as microsurgical treatment when needed.

Keywords: Spinal cavernous malformations, Intramedullary cavernomas, Spinal cavernomas surgical treatment results

EP-0362 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Trauma in the Etiopathogenesis of Progressive Vertebral Hemangioma

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Vertebral hemangioma formation following vertebral fracture is a very rare condition. Only a single case exists in English literature, other than ours. A 40 year old male patient admitted to outpatient clinic with back pain and weakness in both legs. He had a history of L1 burst fracture following trauma a year on without any sign of hemangioma at this level. Radiological findings showed this time hemangioma of L1 vertebral body that compressed the spinal cord. Following partial embolisation, surgery was performed but only a subtotal removal of the hemangioma and total laminectomy of L1 could be achieved due to profuse bleeding. Pathology report showed capillary hemangioma and the patient's complaints and findings resolved after surgery. 8 months following surgery, control MRI scan showed overt progression of hemangioma and significant destruction of L1 vertebrae. Following this time a total embolisation, a complete removal of hemangioma, anterior fusion of T12-L2 by cage and anterior plate, was performed. 18 years of follow-up showed no signs of recurrence. This second case ever to be seen in English literature, has very particular outcomes in respect to spinal hemangiomas: 1) spinal hemangiomas can be post-traumatic, 2) spinal hemangiomas can be very aggressive, and 3) if total removal is performed there is no need to utilize radiotherapy in order to prevent recurrence.

Keywords: Hemangioma, Spinal, Trauma, Progressive

EP-0363 [Spine and Peripheral Nerve » Spinal Tumors]

Thoracic Schwannoma with Pleural Extension

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Schwannomas are located in the spinal canal, mostly in the intradural extramedullary region. Intradural extramedullary tumors are 40% of all spinal tumors. Schwannomas are nerve sheath tumors and originate from Schwann cells. These tumors tend to settle posteriorly of the spinal cord. They are most commonly seen in the thoracic region. Anterior A and Anterior B areas are detected in the microscopic examination. In literature, thoracic schwannoma with pleural extension is rare. We would like to present a thoracic schwannoma with pleural involvement and its surgery. A 22-year-old female patient presented with back and chest pain. The patient stated that both legs were paresthetic when walking and the pain increased at night. In the performed examinations, a mass lesion that hyperintense in T2, isointense in T1, heterogeneously enhancing, compressing the spinal cord and left upper lobe of lung was seen at Th4-5 level of spinal cord. In the same session, we excised the capsulated tumor which compresses the spinal cord and performed Th2-3-5-6 posterior stabilization with transpedicular screw; also by thoracic surgeon, thoracotomy was performed

from the 4th and 5th intercostal space and the pleural part of the mass was excised. Then thoracotomy was performed from the 2nd and 3rd intercostal space, Th4 corpectomy was performed and an expandable cage was placed. The pathology was reported as Schwannoma. Her complaints had passed at the third month's checkups. Schwannomas are the most common spinal benign tumors, but the location of the mass affects the complaints and type of the surgery. With today's developing technology, better results are obtained from the surgery. As in all tumors, a multidisciplinary surgical approach is also needed in schwannomas.

Keywords: Schwannoma, Pleura, Thoracic, Surgery

EP-0364 [Spine and Peripheral Nerve » Spinal Tumors]

Management of Upper Cervical, Intradural-Extra Medullary (ID-EM) Spinal Cord Tumors: Treatment and Special Difficulties

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Aim: To illustrate the potential risk and benefit of safety surgery to patients with upper cervical spinal cord tumors.

Method: We report a serie of 7 patients treated: 04 males and 03 females, concerning 3 meningiomas, 3 schwannomas and 1 neurofibroma.

Results: A classification of two types of tumors has been based on an anatomic relationship to the location tumor size and invasion. Mortality in this serie was 0% and there was no recurrence.

Conclusion: These data suggest steps taken to remove these type of tumors, which gave a high safety cure rate, low morbidity and no recurrence rate.

Keywords: Medullary, Spinal cord, Schwannoma

EP-0365 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Tumors: Retrospective Review of 19 Cases

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Background: The spinal cord tumors represent 2 to 4% of all central nervous system neoplasms. Many different types of spinal tumors with various treatment options. Spinal tumors are classified according to their location and relation to the spinal cord and the dura

- * Intramedullary (Ependymoma, Astrocytoma)
- * Intradural extramedullary
- * Extradural (vertebral bone)

Method: Extramedullary and intradural tumors may be localized:

- In the spinal cord's arachnoid membrane (meningiomas)
- in the nerve roots (schwannomas and neurofibromas) and a particular entity represented by myxopapillary ependymomas.

Others etiologies of intra dural tumors: on subarachnoid or subpial sites (as intramedullary tumors) as metastasis, arachnoid cysts, hemangioblastomas, medulloblastoma, epidermoid cyst and pseudotumors (parasitoses, infection (tuberculosis, abscess). The diagnosis was on peroperative.

Results: A retrospective review of 19 cases of Intradural extramedullary tumors are analysed;

- Meningiomas 3
- Schwannomas 6
- Others 10 (arachnoid cyst, dermoid and epidermoid cyst, abscess, arachnoid cyst...)

The primary diagnosis modalities for these tumors is the MRI (Gado contrast enhancement) and include also plain and dynamic Xray imaging and CT scan to evaluate bony anatomy and the stability of the column. The objective of Surgery is total removal and preserve nervous structures and stability of the spinal column.

Conclusion: The intradural spinal tumors are rare. The diagnosis and surgical treatment are well codified and the prognosis is often favorable. However, in some cases the diagnosis is either preoperatively or after histological examination

Keywords: Meningiomas, Schwannoma, Spinal cord, Tumors

EP-0366 [Spine and Peripheral Nerve » Spinal Tumors]

Cervical Chordoma Mimicking a Pott Abscess

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A chordoma is an uncommon slowly growing locally aggressive tumor, arising from remnants of the notochord. It constitutes between 1 and 5% of all primary malignant bone tumors (D'haen et al., 1995). Approximately 50% originate in the sacrum, 35% in the clivus and 15% in the vertebrae proper, with a distribution of 61.1% in the lumbar, 11% in the thoracic and 27.8% in the cervical spine (D'haen et al., 1995). In half the cases more than one vertebral body is affected. Chordomas occur mostly in the fifth decade and the male to female ratio is approximately 2/ 1 (D'haen et al., 1995). Chordomas are often difficult to manage, given their locally destructive behavior and predilection to grow near delicate and critical structures. These factors make the en-bloc resection of these tumors with negative margins, currently the gold standard of treatment, difficult to perform without damaging adjacent structures and causing significant clinical morbidity (Hsu et al., 2010). Here, we report of a 26 year old female patient, previously healthy who presented with a 3 year history of constant brachialgia, she also reported occasional numbness in her hands and some unsteadiness of gait due to extremities weakness; examination revealed a quadriparesis, an altered sensation between C4-C5 bilaterally to both pinprick and light touch, as well as extremity spasticity. A large intraspinal and extraspinal chordoma was completely removed in one operative stage using an anterior approach; we discuss the rationale for our surgical approach, and address the challenge of cervical stabilization after tumor resection.

Keywords: Chordoma, Brachialgia, Quadraparesis

EP-0367 [Spine and Peripheral Nerve » Spinal Tumors]**Combined Evaluation of Results of Spine Metastasis Surgery in Stage of Wide Spread of Cancer Metastasis**

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Method: 75 patients from 16 to 81 ages underwent spinal surgery for metastatic disease from 2009 to 2016 year. Tumor majority presented clear cell renal cancer – 30,3%, 23,1% - plasmocitomas (multiple myeloma), 10,5% - metastasis without primary tumor, other tumors (melanoma, thymoma, metastatic tumors of the gastrointestinal tract, uterus, ovary, lung, prostate, pancreas, thyroid) - 3,5%. Before surgery Tokuhashy, Tomita, Bauer and van Der Leaden prognosis scales were used for survival prognosis and accepted for every patient. We used QLQ C-30 for evaluating quality of life during 1 year after surgery, sighed checkpoints on time before surgery, 1, 3, 6, 12 month after surgery. Quality of decompression we confirmed by comparing of preop and postop MRI and CT scans.

Results: Maximal follow-up was 12 month for 5 patients only. The highest growth of quality of life was watched first 3 month after surgery for more than half percent of patients. We found the main factors effected quality of life of patients with spine metastasis.

Conclusion: Surgical decompression of nerve structures and reconstruction of the spine is the main method to increase quality of life patients with spread cancer to the spine, due to relief of pain and improve of extremity weakness. It is clear that spine metastasis excision does not affect to the common survival of patients in last stage of metastatic disease. This fact makes necessary to consultation each cases by team which consists oncologists, radiologists and surgeons of different profiles for making decision about ability of surgery.

Keywords: Metastatic tumors of the spine, Quality of life, Surgical treatment of metastases

EP-0368 [Spine and Peripheral Nerve » Spinal Tumors]**Laminoplasty in the Management of Paediatric Metastatic Neuroblastoma of the Spine**

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Neuroblastoma affects around 100 children each year in the United Kingdom. Prognosis is much poorer for children older than 18 months old but also depends on clinical stage, site of primary tumour, histology, regional lymph node involvement and response to treatment. Here we illustrate 2 cases of children aged 8 and 16 months who were treated with tumour resection through laminoplasty. The role of surgery is usually biopsy/urgent decompression and not for complete tumour resection. In case of Metastatic spinal cord compression(MSCC), urgent neurosurgical intervention and urgent chemotherapy has been advocated; however this is still controversial. The most common surgical procedures

used are laminectomy and laminoplasty. Laminectomy in growing children however results in high rates of post-operative deformity. We have shown through our cases of thoracic neuroblastoma with MSCC that the these risks can be minimised through laminoplasty. Both patients achieved good functional outcome and fell into low risk category.

Keywords: Neuroblastoma, Laminectomy, Laminoplasty, MSCC

EP-0369 [Spine and Peripheral Nerve » Spinal Tumors]**Primary Bone Tumors of the Spine: A Clinical Analysis of 20 Patients**

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Background: Primary vertebral tumors, although less common than metastases to the spine, make up a heterogeneous group of neoplasms that can pose diagnostic and treatment challenges.

Method: This retrospective study reviews twenty reports of primary spinal tumors treated in the department of neurosurgery of Fattouma Bourguiba University Hospital during the last fifteen years.

Results: 16 men and 4 women aged between 5 and 78 years (mean 16 years) were included in the study. Back pain and neurological deficits were the most common presenting symptoms. The average time to diagnosis was 18 months. The lesion located to the thoracic spine and sacral region in seven patients, the cervical spine in three patients and the lumbar spine in four cases. Total spondylectomy was realized in six patients. Histological types included osteoid osteoma (2), Brown tumor (2), osteoblastomas (4), chordoma (4), lymphoma (2), Ewing's sarcoma (2) and primary plasmacytomas (4). Adjuvant treatment with radiotherapy and/or chemotherapy was performed in 13 cases. Three cases of chordoma recurred within 11 months and a tumor control was reached in 15 cases after a median follow-up period of 2.5 years (range: 1-11 years).

Conclusion: Primary malignant tumors are markedly more frequent than benign tumors in the spine. Early intervention is necessary to restore the spinal stability, decompress the spinal cord and realize the maximum tumor resection allowing for a best tumor control.

Keywords: Spine, Tumor, Surgery

EP-0370 [Spine and Peripheral Nerve » Spinal Tumors]**A Rare Presentation of Concomitant Cervical Myelopathy and Sacral Chordoma**

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A 60 yr old patient came with low back ache and lumbar radiculopathy with myelopathic symptoms involving both upper and lower limb. On imaging pt had a cervical compression due to ossified posterior longitudinal ligament complex and a sacral chordoma. Decision to operate sacral chordoma first and then tackling the cervical compression was taken after a thorough contemplation taking in to consideration the pathology in the

sacrum which is a locally aggressive tumor. Patient underwent a complete excision of the tumor and sacrectomy without any breach of the capsule or spillage of the tumor. Immediately after the surgery the patient was relieved of the low back ache and radiculopathic pain. After three weeks a posterior cervical decompression was done after which his myelopathic symptoms like loss of manual dexterity, posterior column signs and bowel and bladder symptoms and signs reversed. Patient has had no relapse of the tumor on three years follow up. He has recovered well and doing his manual agricultural work in his farm. This is presented for its rarity of presentation and the successful treatment and recovery.

Keywords: Rare, Concomitant, Spine

EP-0371 [Spine and Peripheral Nerve » Spinal Tumors]

Purely Extradural Spinal Meningiomas - Diagnostic Dilemmas and Treatment Options

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Extradural meningiomas account for approximately 7% of all spinal meningiomas and are most commonly located in the thoracic spine. Our understanding of purely extradural spinal meningiomas is still incomplete and they may be easily confused with other malignant neoplasms, much more common in this location. We report on two unusual cases of purely extradural thoracic spine meningiomas. In addition, we discuss the potential pitfalls in differential diagnosis and review the relevant literature concerning their treatment and outcome. The first case is a 33-year-old woman who was admitted for back pain and motor weakness. Radiological investigations revealed a strongly enhancing extradural mass at the T3-T4 level. Complete surgical resection was achieved through posterior approach and the final histological diagnosis was grade I meningioma. The patient remained symptom free with no recurrence until most recent follow-up examination, three years later. The second case is of a 70-year-old man who presented to our department with similar complaints in relation with a space occupying anterior lateral extradural lesion at T5 level. A posterolateral approach allowed for complete resection of the mass and the definitive histological diagnosis was an atypical (WHO grade II) meningioma. The tumor recurred two years later and in this case invaded the T5 vertebral body, which was subsequently removed by transthoracic approach. The patient received post-operative radiation therapy with no further recurrence, two years later. Although rare, purely extradural spinal meningiomas should be included in the differential diagnosis of extradural contrast-enhancing masses.

Keywords: Spine, Extradural, Meningioma, Surgery

EP-0372 [Spine and Peripheral Nerve » Spinal Tumors]

Spinal Canal Meningiomas (Management of 33 Cases)

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Background: Spinal meningiomas are relatively rare benign tumors, they are responsible for spinal cord compression, the reference complementary examination is MRI. The treatment is exclusively surgical with satisfactory postoperative results. The long term evolution is marked by the risk of recurrence.

Method: Our work is a retrospective study conducted in the Neurosurgery department of Ibn Rochd University hospital Casablanca between 2000 and 2016: 33 cases of spinal meningiomas were recorded.

Results: They represent 13% of all spinal cord compression during this period. A frequency estimated at 1.7 cases / year. A maximum of cases was registered in 2007 (4 cases) and a minimum in 2006 (1 case). The age varies between 14 and 76 years with an average of 45 years. Report Sex: 4 F / H. The period of consultation varies between 1 month and 4 years with an average of 24.5 months. We realized for all patients X-ray and MRI. CT scan was made in 60% of patients. Dorsal location found in 84.84%, they were intradural extra-medullary (79%) and lateral (33%) posterior (24%) compared to the marrow. The total resection Grade I Simpson was made in 76% cases with laminectomy in 31 cases. The histological type is dominated by psammomatous (30%) and meningotheliomatous (28%). The evolution was good in 48.48% of cases, we had a poor outcome or non-improvement in 20.06% of patients, 12.12% have recurrence, 18.8% are lost.

Keywords: Spinal canal, Meningioma, Management, Surgery

EP-0373 [Spine and Peripheral Nerve » Spinal Tumors]

Pedicular Subtraction Osteotomy of Thoracic Spine for Sagittal Imbalance Correction After Multiple Myeloma: Case Report

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Pedicular subtraction osteotomy (PSO) is a technique used for surgical correction of fixed deformities in the sagittal plane of the spine. It is technically complex and associated with high morbidity. The authors report a case of one patient who underwent PSO for correction of severe kyphotic deformity of the thoracic spine due to pathological fractures secondary to multiple myeloma. A 69-year-old male patient came to our clinic with dorsalgia and deformity limiting his daily activities. His history began 3 years ago when he was diagnosed with multiple myeloma. At that time, the patient was diagnosed with pathological fractures of thoracic and lumbar vertebrae. He underwent chemotherapy and, after remission of the disease, he underwent T2 to T6 thoracic arthrodesis to stabilize the thoracic spine. Post-operatively it evolved with a progressive and great accentuation of thoracic kyphosis. Neurological exam showed no abnormalities and Computerized Tomography Cobb angle was 90 degrees at T5 level. For arthrodesis construct of the thoracic segment, parallel metal rods anchored with transpedicular screws were used in T1, T2, T5 and T6. The patient underwent PSO with extension of T2 to T11, using parallel rods, transpedicular screws and reinforcement with bone cement in the vertebrae in which the screws were applied. Post-operatively, it evolved well, without

neurological alterations and with a 30-degree improvement in the Cobb angle. PSO is a therapeutic option used for the correction of sagittal imbalance deformities. Although it is considered technically challenging and associated with high morbidity, it achieves good results in experienced hands.

Keywords: Sagittal imbalance, Pedicular subtraction osteotomy, Osteotomy, Multiple myeloma

EP-0374 [Spine and Peripheral Nerve » Spinal Tumors] Archnoid and Cyst Hydatid Collision

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The authors here described an unusual case of a hydatid cyst in the sacroiliac and iliac joint, which seems to be the first such case in the literature. The cyst was successfully removed using the puncture, aspiration, irrigation, and resection technique. 27 years old female. she has got headache, dizziness and left leg pain. In her history Previous cysts from both lungs had undergone hydatid operation and c/s. Mr image; Left sacroiliac at joint level, and multinodular recurrent hydatid cyst in sacrum. Diffuse MR images showed left temporal and anterior archnoid cyst. Her vital signs were normal. The patient had a normal Glasgow Coma Scale score of 15. Vas;7. Acupuncture needles applied to patient. Total 2 session were applied. Needles are applied around sacroiliac scar, GB-34, YIN TAN, Sp-6, Liv-3, jerome and temporal lob region. Acupuncture was performed on both the body and ear of the patient. Patient was relief from pain. Vas;2. They are found in all age groups and account for about 1% of intracranial mass lesions (1). Only a few patients will be symptomatic; symptoms vary with cyst location and can include headache, seizure, ataxia, dizziness, visual changes and nausea (2). Management of these cases is controversial because archnoid cysts are often incidental findings that correlate poorly with specific seizure type and electroencephalogram focus (3). Symptomatic patients may be candidates for surgery; operative management may improve symptoms such as headache or dizziness in some patients.4 However, most lesions are considered incidental and can be treated conservatively (1,2).

Keywords: Archnoid cyst, Cyst hydatid

EP-0375 [Spine and Peripheral Nerve » Spinal Tumors] Surgical Management of Sacrococcygeal Chordomas Assisted by Temporary Transcatheter Balloon Occlusion of the Abdominal Aorta

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Background: Because of the complex anatomy of the sacral region, the risk of uncontrollable intraoperative hemorrhage, and the typically large tumor size at presentation, complete resections are technically difficult and the tumor recurrence rate is high. The aim of this study was to assess the value of using occlusion of the abdominal aorta by means of a balloon dilation catheter and electrophysiological monitoring when an extensive sacrococcygeal chordoma is removed.

Method: Between January 2008 and June 2012, 28 patients underwent resection of extensive sacrococcygeal chordomas in our department with the aid of occlusion of the abdominal aorta and electrophysiological monitoring. All of these operations were performed via the posterior approach. The blood lost during the operation and the sphincter muscle function of the bladder and bowel was observed. All of the patients underwent postoperative radiotherapy, and the mean doze was 60Gy.

Results: Wild resections were performed in 12 cases and marginal excisions in the other 16. Intraoperative hemorrhage was controlled at 400 to 1000 ml. The 30-day perioperative morbidities in this series included 1 (3.6%) death from postoperatively hemorrhage. 6 (21.4%) of the patients had partial or complete loss of bladder and bowel functions. All patients in this group remained ambulatory after the surgery.

Conclusion: Occlusion of the abdominal aorta and electrophysiological monitoring are useful methods for assisting in resection of sacrococcygeal chordoma. They help to reduce intraoperative hemorrhage and protect the organs in the pelvic cavity and neurological function.

Keywords: Sacrococcygeal chordoma, Aorta occlusion, Intraoperative electrophysiological monitoring

EP-0376 [Spine and Peripheral Nerve » Spinal Tumors] Lumbar Spine Osteoblastoma: Radio-Guided Surgery

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Osteoblastomas is a rare benign primary bone tumors. They account approximately 3% of benign and 1% of primary bone tumors. Lumbar pain is the common revelation sign. The treatment is total surgical resection. We report two cases of lumbar osteoblastomas in young patients; The two are evaluated by simple x ray; CT scan and MRI showing a lumbar osteolytic lesion. The Technetium bone scan allow a precise localisation of the lesion. The surgery involve total resection of the tumor guided by using radio detection in per surgery, the surgical nuclear probe "Europrobe". The two patients are a 18 years old girl and a 17 years old boy. Low back pain is the common presentation. Modern imaging and collaboration with nuclear physicians allow clear investigations. In the two cases surgical planning with per operative control of the tumor-site guided a complete removal. The result is to confirm during the intervention that there is no residual tumor that can be a source of recurrence. The mean follow up is 5 years. Osteoblastoma is a benign tumor requiring a total removal to avoid recurrences. The per operative control by Technetium bone scanning is simple and practical use. It allows to assert the complete total excision.

Keywords: Osteoblastoma, Radio detection, Technetium bone scan

EP-0377 [Spine and Peripheral Nerve » Spinal Tumors] Aggressive Vertebral Hemangioma of the Thoracic Spine

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Vertebral hemangiomas are common tumors of the spine that are benign and rarely symptomatic in adults. These lesions can exhibit aggressive features such as bony expansion and erosion into the epidural space resulting in neurological symptoms. Hemangiomas in the thoracic vertebrae are more likely to be symptomatic due to the narrow vertebral canal dimensions. If the symptoms are severe or rapidly progressive, the surgery is often recommended. Some surgeons perform decompression alone, others perform gross-total resection, while others perform en bloc resection. Multiple therapeutic options have been described with varying degrees of success, including embolization, radiation, vertebroplasty, ethanol injection, surgery, and any combination thereof. A 46-year-old female patient with a two-month history of severe upper back pain, radiating to both lower limbs, is presented. Imaging studies revealed an aggressive vertebral hemangioma centered within the T-4 vertebral body involving the pedicles, transverse and spinous process with bony and soft tissue extension into the spinal canal. The patient underwent preoperative endovascular embolization to minimize the risk of blood loss, the day after, decompression by laminectomy and vertebroplasty performed. The postoperative period was uneventful, the patient was pain free without any neurologic deficits. Vertebroplasty provides hemostatic embolization, augments the load-bearing capacity of the anterior column, and obliterates residual tumor. Preoperative embolization, gross-total resection or subtotal resection in combination with vertebroplasty or adjuvant radiation therapy to treat residual tumor seems sufficient in the treatment of aggressive vertebral hemangiomas.

Keywords: Aggressive, Vertebral hemangioma, Thoracic spine, Embolization, Vertebroplasty

EP-0378 [Spine and Peripheral Nerve » Spinal Tumors]

Dorsal Spine Giant Cell Tumor with Paraplegia: A Case Report

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Very rare case of Giant cell tumors (GCT) of the spine is seen in the neurosurgical aspect. We report a case of (GCT) of the eleventh dorsal vertebra revealed by severe backache with paraplegia in a 30-year-old woman. Imaging showed an osteolytic lesion invading the vertebral body, the posterior arch and compressing the spinal cord. Neurological decompression was performed but after 2 months pain recurred. Then after two months recurrence of tumor was seen in MRI and again surgical decompressions were done along with long segment transpedicular fixation and patient was significantly improved. A surgical biopsy was obtained at the same time to confirm the diagnosis. Giant cell tumor is not so common in the thoracic region. We believe that the gross total removal of tumor provides a good outcome for the patient.

Keywords: Giant cell tumors, Dorsal spine, Tumor recurrence

EP-0379 [Spine and Peripheral Nerve » Spinal Tumors]

Cervical Spinal Cord Compression and Demyelinating Neuropathy Complicating Neurofibromatosis Type 1: A Case Report

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Von Recklinghausen disease or neurofibromatosis type 1 (NF1) is an inherited disease manifested by tumors in organs of neuroectodermal and cutaneous origin. The association of cervical spinal cord compression and demyelinating polyneuropathy during neurofibromatosis is rare. We report the case of a patient who was admitted in the neurology department of Fann national teaching hospital, Dakar, Senegal. This was a 64-year-old patient with cutaneous neurofibromatosis diagnosed at the age of 16 years, received for upper and lower limbs motor deficit of gradual installation over a month. Clinical exam showed a fairly good general condition, a flaccid tetraparesis, a bilateral Babinski sign, hyperesthesia on the 4 limbs, urinary incontinence, dorsal scoliosis, dozens of cutaneous coffee-to-milk tasks. A spine MRI showed a spinal cord compression due to a C5 cervical neurinoma, a dorsal cyphoscoliosis. An electroneuromyography examination (ENMG) revealed a sensitive-motor demyelinating neuropathy of 4 limbs. A motor reeducation had been performed and treatment based on Amitriptyline was established and surgical excision was proposed. The course was marked by an aggravation of his condition and death two months after admission. Demyelinating polyneuropathies are rare in NF1, only the use of the ENMG examination makes it possible to diagnose. Central neurological complications are most often the result of extra-axial medullary compression by a neurofibroma. Regular neurological follow-up of patients with NF1 and ENMG for diagnostic and prognostic purposes should be done for research of associated peripheral neuropathy.

Keywords: Neurofibromatosis type 1, Demyelinating peripheral neuropathy, Cervical spinal cord compression

EP-0380 [Spine and Peripheral Nerve » Spinal Trauma]

Spinal Cord Injuries without Visible Bone Lesions: Analysis of Five Consecutive Cases

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Background: Spinal cord injuries without visible bone lesions, formerly called SCIWORA are rare diseases, often found in children and affecting the cervical spine.

Method: We performed a retrospective study at the Neurosurgery Department of Grand Yoff General Hospital from January to

December 2016. Five patients were followed for spinal cord injury without visible bone lesions. We analyzed the radiological, clinical, therapeutic and evolutionary data. Trauma caused by stabbing were excluded.

Results: In a year, 357 cases of spinal trauma were received in the department. Among them, 5 had Spinal cord injuries without visible bone lesions. The average age was 30 years, with extremes ranging from 14 to 47 years. The sex ratio was 4. We have recorded 2 cases of road traffic accidents, 2 cases of fall and 1 case of sports accident. On the neurological level, we found 3 cases of quadriplegia, 1 paraplegia and 1 monoplegia. Computed tomography in all patients was normal. They benefited from magnetic resonance imaging that showed spinal cord injury. Medical treatment were administrated.

Conclusion: In presence of any post traumatic myelopathy case, the absence of disco-vertebral lesions, should bring to mind the SCIWORA as well as indicate the realization of magnetic resonance imaging.

Keywords: Spinal cord injuries, Bone's lesions, Magnetic resonance imaging

EP-0381 [Spine and Peripheral Nerve » Spinal Trauma]

Spinal Stab Wounds: Our Experience About 24 Cases

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Background: Spinal stab wounds are rare events and their reports in the literature are scarce. Our aim was to study epidemiological, clinical, radiological, therapeutic and prognostic characteristics of patients with spinal stab wounds, with review of the related literature.

Method: A retrospective analysis of 24 medical files of patients admitted at the department of Neurosurgery of Hassan II University teaching hospital between March 2001 and December 2016.

Results: The mean age of our patients was 27.9 years. Men were most frequently affected (83.33%). We have found that 70.83% of our patients were admitted with neurological deficit, classified according to Frankel Grading: grade A and grade B with 2 cases in each category. Grades C and D, in 6 and 7 cases respectively. Spine X-rays has been performed initially in all patients; additional CT scan in 4 cases and spinal MRI in 22 cases. The involvement of the thoracic spine and the thoracolumbar junction is predominant, in 33.33% and 41.6% cases respectively. All of our patients received prophylactic antibiotherapy, 9 have been surgically operated, 6 of whom underwent emergency surgery, the remaining 3 patients with CSF leak have undergone surgical management 48 hours later. All cases with neurologic deficit had been managed with prophylactic anticoagulant agents and motor rehabilitation. The mean follow-up time was 8 years. One patient had died and 2 others had persistent grade B neurological deficit.

Conclusion: Spinal stab wounds is a rare entity with a good outcome if correctly managed.

Keywords: Spine, Stab injury, Penetrating spine injury, Spinal cord injury

EP-0382 [Spine and Peripheral Nerve » Spinal Trauma]

Effectiveness of Balloon Kyphoplasty in Osteoporotic Patients with Spontaneous Vertebral Compression Fractures

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Aim: To assess the outcomes of our patients who underwent balloon kyphoplasty for spontaneous osteoporotic vertebral fractures regarding pain relief, correction of the vertebral body height, and complications such as adjacent segment vertebral fractures.

Method: We evaluated 63 consecutive patients (74 vertebral bodies) with vertebral body compression fracture who were treated by balloon kyphoplasty. Patients' body mass index (BMI), bone mineral density (BMD), level(s) of the fractured vertebrae, visual analog scale (VAS) for pain intensity were noted. Local kyphosis angle (KA), and the rate of vertebral height loss (VHL) were measured. Oswestry disability index (ODI) was used to assess the disability. All the patients had a minimum follow-up of 12 months.

Results: KA and VHL as well as VAS and ODI scores significantly improved at the final follow-up ($p < 0.05$, $p < 0.001$ respectively). There were cement leakage in 5 procedures (6.7%) and 11 (14.8%) adjacent segment fractures (ASF) were detected during the follow-up.

Conclusion: Balloon kyphoplasty is an effective and safe procedure that can provide early pain relief, improve function and correct the deformity in spontaneous osteoporotic vertebral body fractures.

Keywords: Balloon kyphoplasty, Osteoporosis, Compression fractures

EP-0383 [Spine and Peripheral Nerve » Spinal Trauma]

Comparison of Long Term Results of Posterior and Circumferential Stabilisation of Thoracolumbar Burst Fractures

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Background: Thoracolumbar traumatic fractures of the spine are common and can be a source of great disability. Even though improved medical techniques, approach to thoracolumbar traumatized patient is still controversial. The aim of the surgical treatment of thoracolumbar burst fractures is decompression of the spinal cord and the spinal nerves, achieve stability, prevent kyphosis deformity and allow for early mobilisation.

Method: In this study, the initial and post-operative kyphotic angulation was evaluated and we compared the efficacy of the surgical techniques to define the priority of anterior surgical treatment indication. A total of 29 patients with thoracolumbar burst fracture from T4 to L4 were treated surgically. Eighteen of the operations were performed by posterior approach, 11 of the

operations were operated by posterior plus anterior approach.

Results: A retrospective analysis was done with the data of pre-operative kyphosis existence, the condition of anterior and posterior ligaments, the neurological situation and the McCormack's load sharing grades.

Conclusion: This study showed that thoracolumbar fractures with anterior longitudinal ligament disruption, especially with high kyphotic angle should be operated by combined anterior-posterior surgery. Posterior only surgery is efficacious if the ligament is intact.

Keywords: Circumferential stabilisation, Posterior stabilisation, Thoracolumbar burst fractures

EP-0384 [Spine and Peripheral Nerve » Spinal Trauma]

Penetrating Spinal Injuries, Registration of Cases in Sohag University Hospital, 2012 - 2016

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Background: Penetrating spinal cord injuries caused by missile or stab wound injuries are uncommon. The harm may be due to direct injurious effect or may be due to the resulting vascular insult or spinal infarction or a late infection at the site of injury. Penetrating injuries may cause a neurological motor, sensory or an autonomic deficits or a combination of them. The aim of the study: Evaluate the penetrating spinal injuries and describe both clinical and radiological characteristics of patients. Assess course and the prognosis in both complete and incomplete spinal cord injuries.

Method: case series prospective study of 28 patients came to the emergency department at Sohag University hospital between March 2012 and January 2016 with penetrating spinal injury caused by knives, dagger, missile and nail gun injuries. Complete general and neurological examination including motor power, sensory examination using Frankel grading classification.

Results: Average age was 28.36 ± 5.96 years with male predominance (78.6%). Our study shows the frequency of the lesions' sites, 12 lumbar, 12 dorsal, and 4 cervical cases. For the degree of spinal cord injury, 16 cases (57.1%) showed no spinal cord injuries, 8 patients (28.6%) showed incomplete spinal cord injuries and 4 patients (14.3%) had complete spinal cord injury.

Conclusion: Missile injuries have the most detrimental effect among penetrating spinal injuries. Complete spinal cord injuries have the worst prognosis. Most of the incomplete spinal cord injuries had improved with varying degrees. prognosis of the penetrating spinal injury is proportional to extent and to the level of injury.

Keywords: Stab injuries, Penetrating wounds, The neurological deficit, Spinal cord injuries

EP-0385 [Spine and Peripheral Nerve » Spinal Trauma]

WITHDRAWN

EP-0386 [Spine and Peripheral Nerve » Spinal Trauma]

Percutaneous Vertebroplasty: A First Line Treatment in Traumatic Non-Osteoporotic Vertebral Compression Fractures

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Background: Percutaneous vertebroplasty (PV) is commonly used for osteoporotic and neoplastic compression fractures, however its use in traumatic non-osteoporotic compression fractures is uncertain. The aim of this study was to document and evaluate the clinical and radiological results of (PV) as a first line treatment in traumatic non-osteoporotic vertebral compression fractures (TNVCFs).

Method: This was a prospective cohort study. We included 23 patients with traumatic non-osteoporotic TNVCFs and normal bone mineral densitometry scores who were treated with PV. Pain was evaluated at 2 hours, 1 week, 1 month, 6 months, 1 year, and 2 years post procedure using the 10-point visual analogue scale (VAS). Ronald-Morris disability Questionnaire (RDQ) scores were also collected. Statistical analysis included a 2-tailed t test comparing postoperative data with preoperative values. Range of mobility was also evaluated.

Results: The 23 patients had an average age of 36 years, and 69.5% were female. There was a significant improvement in VAS scores of pain at rest and in motion and in RDQ scores ($p < 0.05$).

Conclusion: The results of this study proved that PV can be used successfully as a first line treatment in patients with non-osteoporotic compression fractures. It is also, an effective method to decrease pain, increase mobility, and decrease narcotic administration.

Keywords: Trauma, Non osteoporotic vertebra, Vertebroplasty

EP-0387 [Spine and Peripheral Nerve » Spinal Trauma]

Multilevel Kyphoplasty: 8 Years of Followup

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Background: Kyphoplasty is an established procedure for the treatment of osteoporotic fractures. With this study we are trying to assess the effect of multilevel interventions to the long term success of the procedure.

Method: We have included our own results for 75 patients and a total of 216 levels (Mean: 2.88 levels/patient, Range 1-11). We used the VAS to assess the improvement on pain, and the Oswestry disability Index to assess the functional outcome by number of Levels at 1 and 6 months and 2 years post op. We are repeating the tests 8 yrs later and comparing to 2 yrs post-op.

Results: More than 70% of patients had very satisfactory improvement (VAS ≤ 3 at 1 month, $>80\%$ at 6 months and almost 60%, 65% and 60% had ODI $\leq 30\%$ at 1 month and 2 years respectively ($p < 0.01$). This deteriorated by No of levels. Mean VAS has improved from 6.35 to 2.77 in the first month, and 1.80 in 2 years. Mean ODI has improved from 56.9 to 30.5 and 28.6, respectively

($p < 0.01$). 8 Years later 33/75 patients were lost to followup. VAS 8yrs = 2.74 and ODI 8yrs = 47.45.

Conclusion: Kyphoplasty is a safe, quick and efficacious standalone procedure especially for the treatment of Multilevel osteoporotic fractures. It provides very satisfactory relief for pain with minimal complications. In many cases the interest for long term results is only literary – due to old age-, in the remaining the ODI deterioration is attributable more to age itself than to the failure of the procedure.

Keywords: Kyphoplasty, Results, ODI

EP-0388 [Spine and Peripheral Nerve » Spinal Trauma]

Management of Thoracolumbar Fractures: 5 Years Experience after WFNS Training Programme

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Aim: To set-up an epidemiological, clinical profile and therapeutic approaches.

Method: Prospective study from 2010 to 2015 about 98 patients treated for thoracolumbar fractures after 5 y training in neurosurgery at Rabat WFNS center.

Results: Age ranges from 18 to 70 y. Mean age is 30.57 y. Male predominance with rate 2/1. Falls account for majority cause of injury follow by tragic accident 27.02%. Admission delay was more than 24 hours. Frankel scale grading: A 29.05% and B is 31.42 %. Thoracic fractures account for 34 cases. Types of lesions: burst fractures in 59 cases. Surgical treatment was performed for 89 cases and orthopaedic in 7 cases. The assessment of neurological recovery showed that patients with incomplete deficit have improved in more than 65% of cases. The residual deformity after treatment was acceptable.

Conclusion: Early reduction and stabilisation of unstable TLF in emergency situation with posterior approach and internal fixation by pedicle screws and plates or with pedicle and rod allowed for the improvement of patients.

Keywords: Spine, Spinal injury, Posterior approach, Thoracolumbar

EP-0389 [Spine and Peripheral Nerve » Spinal Trauma]

Efficacy and Outcome of Autologous Bone Marrow Derived Stem Cells in Acute Complete Spinal Cord Injury- A Randomized Placebo Controlled Trial

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Background: Due to lack of well-designed trials, there is no good evidence on the efficacy of stem cell in spinal cord injury (SCI). The aim of this study is to study the efficacy and outcome of autologous bone marrow derived stem cells (BMSC) in acute complete SCI.

Method: In this prospective study over 3-year period (2012-2014), patients with acute (defined as within one week of injury) and complete (ASIA grade A) SCI were randomized to receive BMSC or placebo through intramedullary route intraoperatively at the time of spinal decompression & fusion. Institutional ethics approval was

taken & informed consent was taken from all patients. Functional outcome was assessed using ASIA scale, SCIM score and SSEP responses preoperatively, three and six months after surgery.

Results: A total of 13 patients were available for final analysis of which 6 were in stem cell group and 7 in placebo group. Both groups were well matched in the M:F ratio, age and weight. Six patients (85%) had improvement by at least one grade in ASIA score in the stem cell group as compared to only one patient (16.5%) in the placebo group. ASIA sensory score improved from a preoperative mean of 124 (68-144) to 224 (156-224) at 6 months as compared to static mean score of 115 in the placebo group and functional motor improvement was also seen in stem cell group. SSEP waveform and SCIM scores were also significantly improved in stem cell group as compared to placebo group.

Conclusion: Patients treated with stem cell had improved quality of life and there was significant improvement in ASIA score (in both motor and sensory components) in stem cell treated patients.

Keywords: Bone marrow derived stem cells, Complete spinal cord injury, Safety, Intramedullary, Feasibility

EP-0390 [Spine and Peripheral Nerve » Spinal Trauma]

Hibrid Surgery with an Intraarterial Stent Held Ready to Use During Thoracic Screw Replacement - A Case Report

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Bicortically placed thoracic screws - especially if they are too long or placed laterally - have the potential to injure thoracic major vessels. These screws repeatedly pose a dilemma to the surgeon, especially when revision surgery is considered months after screw placement. In our case a possible screw migration month after the primary surgery was documented, which resulted in radiological vascular compromise. A hibrid vascular, endovascular and an open spinal surgery was performed simultaneously, with the aim of assessing contrast extravasation during screw removal, and - if necessary - introducing intraarterial stent simultaneously to prevent further bleeding from the thoracic aorta. Contrast extravasation was not observed, therefore the intraarterial stent - with the introducer in place, and with the stent held ready to use in any moment - was not utilized. During follow up, no complications were noted. The position of thoracic screws in contact with major vessels can even later show a more unfavourable picture. Precise preoperative planning, consultation, and good intraoperative teamwork can spare the use of a costly endovascular implant.

Keywords: Thoracic screw replacement, Endovascular implant, Spare

EP-0391 [Spine and Peripheral Nerve » Spinal Trauma]**Gunshot and Shrapnel Injuries of Spine During Syrian Civil War**

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Aim: To investigate the surgical outcomes and complications of Syrian Civil War gunshot injuries in our hospital.

Method: This study included gunshot and shrapnel injuries. Sixty-nine patients were analyzed retrospectively between June 2015 and August 2016. All patients were treated in Kilis State Hospital, Kilis, Turkey, which is near to Syrian border.

Results: During this time period 69 patients were treated. Of these, 54 patients were adult (male/female: 44/10), 15 were child (male / female: 9/6). Mean duration of the transport was 26.68±20.91 hours. Preoperative American Spinal Injury Association (ASIA) scale score was; A in 25 (36.2%), B in 14 (20.3%), C in 11 (15.9%), D in 9 (13%), E in 10 (14.5%) patients. Thirty-two (46.4%) patients had lumbar, 23 (33.3%) had thoracic, 9 (13%) had cervical and 5 (7.2%) had multiple level injuries. Twenty-two (31.9%) patients had bullet and 47 (68.1%) had shrapnel injuries. Fifty (72.5%) patients had surgery, 19 (27.5%) had conservative treatment. Eight patients were died. Sixty patients had postoperative ASIA score; A in 15 (24.6%), B in 8 (20.3%), C in 9 (14.8%), D in 12 (19.7%), E in 17 (27.9%) patients.

Conclusion: Gunshot and shrapnel injuries are common injury types during war. Spinal gunshot and shrapnel injuries has high morbidity. Multiple factors affects the surgical results of spinal war injuries. Injury pattern, additional injuries of the other organs and initial ASIA of patients are important factors affecting the results.

Keywords: Gunshot, Injury, Shrapnel, Spine, Syrian civil war

EP-0392 [Spine and Peripheral Nerve » Spinal Trauma]**From Paraspinal Hematoma to an Extensive Spinal Epidural Abscess in a Child: How a Mild Lumbar Trauma may Lead to a Devastating Condition**

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Spinal epidural abscess (SEA) is an uncommon entity. Since it is a threatening disease, its clinical importance overshadows its rarity. SEA is seen especially in adult population. It is less frequent in pediatric population and count less than 100 in medical literature. The authors report the unique case of a SEA developed a week after a lumbar trauma secondary to the infection of a paravertebral hematoma in 6-year-old girl. A 6-year-old previously healthy female was victim of lumbar trauma (knee hit). She suffered from a paravertebral swelling and pain. One week later, she developed fever and paraparesia. The MRI showed an epidural abscess with compression on the spinal cord. This abscess originates from a neighboring paraspinal infected

hematoma. She underwent emergent hemi laminectomies. The epidural and paraspinal abscesses were evacuated. She received initially empiric antibiotics. On blood and pus culture Methicillin-sensitive Staphylococcus aureus was isolated. The post-operative course was uneventful. She recovered well and discharged home after 4 weeks of IV antibiotics. This case is unique for many reasons. It shows that a paravertebral posttraumatic hematoma, considered as a benign lesion, can transform into an abscess and extend rapidly into the vertebral column. This contamination can lead to a devastating condition: an epidural abscess. Immediate institution of appropriate antibiotic therapy, proper imaging studies, and rapid surgery are paramount to prevent irreversible sequelae.

Keywords: Trauma, Paraspinal hematoma, Epidural abscess, Surgery

EP-0393 [Spine and Peripheral Nerve » Spinal Trauma]**Posterior Approach in Traumatic Thoracic and Thoracolumbar Spondyloptosis**

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Background: In this study, clinical findings and follow-up results of 12 patients with spondyloptosis that occurred after a high-energy trauma were evaluated.

Method: Twelve cases with the thoracic and thoracolumbar region traumatic spondyloptosis at three separate centres in the city of Gaziantep between 2010 and 2016 were examined retrospectively. The clinical and radiological results, additional system injuries and long-term results of the patients were evaluated.

Results: The mean age of the patients was 30.4. The causes of trauma were falling down from a height (8 cases) and a traffic accident (4 cases). Spondyloptosis was detected at the upper thoracic level in two cases (Th3-4 and Th4-5); Th9-10, one case; Th10-11, four cases; Th11-12, three cases and Th12-L1, two cases. Pre- and postoperative neurological status of all cases was ASIA A. In all cases, 5 levels of fixation were performed after reduction with posterior intervention. In addition, 2 patients died; specifically, one patient with thoracic trauma and one with embolism due to deep vein thrombosis at the third month post-op. Severe fusion was observed in 9 of our living patients and 1 had a moderate fusion.

Conclusion: In plegia cases with acute thoracolumbar spondyloptosis, reduction via the posterior approach only is a method to be applied without posing additional surgical morbidity and mortality risk to patients in order to provide early mobilisation of the patients with pedicular fixation and posterolateral intercostal fusion and increase the quality of life.

Keywords: Spondyloptosis, Trauma, Surgery, Fusion

EP-0394 [Spine and Peripheral Nerve » Spinal Trauma]**Effects of Neuroprotective of O-Desulfate Heparin in Acute Spinal Cord Injury: An Experimental Study**

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Aim: To investigate effect of O-Desulfate heparin therapy in an experimental spinal cord injury model in rats.

Method: In this study, 30 male wistar albino rats were used. Rats were randomly divided into 3 groups. Group 1 [Sham-operated, Laminectomy, (n: 10)], Group 2 [Laminectomy-trauma, (n:10)], Group 3 [Laminectomy-trauma-O-desulfate Heparin therapy, (n: 10)]. Spinal cord trauma was performed in groups 2 and 3 by applying a clip compression injury model for 10 minutes to the spinal cord at T5-8 level. Paraplegia developed in all rats in Group 2 and 3. The third group was treated with O-Desulfate heparin.

Results: All rats were sacrificed on Day 4 after trauma. Tissue for electron microscopic examination were taken from the spinal cord. A Histopathological examination revealed normal ultrastructure in the group 1. The prominent findings in group 2 were Extensive hemorrhagic and edematous areas were frequently noted. Furthermore, the nerve cells revealed nuclear chromatin clumping, enlargement of mitochondria and disruption of their cristae. In the group 3, Extensive hemorrhagic and edematous areas were seen but they were less extensive. Furthermore, the nerve cells revealed nuclear chromatin clumping, mitochondrial alterations, and increase in lipofuscin granules. Moreover, the myelinated nerve fibers showed slight to moderate myelin sheath degenerations.

Conclusion: This study showed the neuroprotective effects of O-Desulfate heparin in the spinal cord injury model in an electron microscopic examination of spinal cord tissue

Keywords: O-Desulfate heparin, Spinal cord injury, Experimental study, Electron microscopic examination

EP-0395 [Spine and Peripheral Nerve » Spinal Trauma]**Spinal Subdural Hematoma After Lumbar Puncture for Intrathecal Chemotherapy. A Case Report**

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Spinal subdural hematoma is a rare complication of lumbar puncture. It could be overlooked with devastating neurological consequences due to a delay in diagnosis. We report the case of 18 years old woman with B-cell acute lymphoblastic leukemia was undergoing a part of the induction chemotherapy by receiving multiple intrathecal methotrexate injections when she experienced a low back pain and a weakness of her both lower limbs. According to the patient, she started to feel that weakness few hours after the second lumbar puncture and two days later she was no more

able to stand up. A neurological worsening with urinary retention and anal incontinence marked the evolution. On presenting on neurosurgical department, one month after the beginning of neurological symptoms, the examination found paraplegia. The patellar and the ankle jerk reflexes were absent. The sensory testing found an anesthesia below the D12 level. She had also a bladder catheter because of the urinary retention. The Magnetic Resonance Imaging showed a thoracolumbar spinal subdural hematoma. The treatment consisted on a surgical evacuation of the hematoma after L2 laminectomy. On follow-up, the patient did not improve significantly. This observation shows that haemato-oncologists should be mindful of subdural hematoma as a possible complication of intrathecal chemotherapy and confirms the severity of the prognosis for late surger.

Keywords: Spinal, Subdural, Hematoma, Intrathecal, Chemotherapy

EP-0396 [Spine and Peripheral Nerve » Spinal Trauma]**Occipitocervical Trauma (Occ/C2) 2010- 2015: Clinical and Radiological Outcome**

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Aim: To describe the experience during five years in the management conservative or surgical in patients with traumatic lesions of the craniocervical union (Occ/C2). To know the outcome in at least 6 months of follow-up.

Method: Since 2010 to 2015 we observed 28 patients. Arthrodesis was done with cages/plate in anterior approach, screw in anterior odontoid approach and C1/C2 screws in posterior approaches. An average follow-up of 12 months. Complications, neurologic improvement and fusion rate was assessed.

Results: Clinical data were available in 28 patients. Mortality rate was 7%, patient with occipito cervical luxation and patient with type II odontoid fracture. Conservative treatment was performed in 11 patients. Odontoid fractures, 13 cases. 60% were more than 60 years old, 40% were young patients. Anterior screw in 4 patients and posterior C1/C2 technique in 5 patients. No revision surgeries. No screw related complications was observed. Atlas fracture in 6 cases. Five were treated with cervical collar and one patient surgery with C1 mass lateral screws. Traumatic spondylolisthesis of Axis in three cases. One case by posterior approach with C2/C3 screws and two cases anterior approach. One needed anterior revision. Rotational C1/C2 luxofracture was observed in two cases, both required surgery with posterior C1/C2 technique. One needed revision due malposition C1 screw.

Conclusion: At present we have implants to get excellent outcomes in comparison with traditional techniques. however is necessary to know about precise diagnosis of the lesion, precise knowledge of the anatomy to avoid complications.

Keywords: Spine trauma, Occipitocervical trauma, Atlas fractures, Axis fractures, Goel/harms technique, Odontoid screw

EP-0397 [Spine and Peripheral Nerve » Spinal Trauma] Vertebral Augmentation by Kyphoplasty and Vertebroplasty: 8 Years Experience Outcomes and Complications

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Background: Minimally invasive percutaneous vertebral augmentation techniques; vertebroplasty, and kyphoplasty have been treatment choices for vertebral compression fractures.

Method: A retrospective review of the hospital records for 100 consecutive patients treated with kyphoplasty or vertebroplasty in our department database. Patients with osteoporotic compression fractures, traumatic compressions, and osteolytic vertebral lesions, including metastases, hemangiomas, and multiple myeloma, were included in the study. Preoperative and postoperative VAS pain scores, percentages of vertebral compression and kyphotic angles were measured and compared as well as demographic characteristics and postoperative complications. Mobilization and length of stay were recorded.

Results: One hundred patients were treated by 110 procedures. 64 patients were operated on due to osteoporosis (72 procedures). Twelve patients were operated on because of metastasis (13 procedures), 8 patients were operated on because of multiple myeloma (9 procedures). Five patients had two surgeries, 1 patient had 3 surgeries, and 1 patient had 5 surgeries. The mean preoperative VAS was 74.05 ± 9.8 . In total, 175 levels were treated, 46 levels by kyphoplasty and 129 by vertebroplasty. The mean postoperative VAS was 20.94 ± 11.8 . Most of the patients were mobilized in the same day they of surgery. Mean LOS was 1.83 days. Six patients had nonsymptomatic leakage of polymethylmethacrylate, and patient had epidural hematoma, which was operated on performing hemilaminectomy.

Conclusion: Percutaneous vertebroplasty and balloon kyphoplasty are both effective and safe minimally invasive procedures for the stabilization of VCFs. However, complications should be kept in mind during decision making.

Keywords: Kyphoplasty, Vertebral compression fractures, Vertebroplasty

EP-0398 [Spine and Peripheral Nerve » Spinal Trauma] Making Decision for Optimal Treatment Modality in Craniovertebral Junction Trauma

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Background: On the one hand the complex anatomy of craniovertebral junction (CVJ) determines diversity of initial traumatic morphological patterns and complexity of surgery, on the other hand especially medical logistics at various levels of health care organizations needs to define creative approach in making

decision for optimal treatment modality. Our aim is to demonstrate peculiarities of making decision for surgery of CVJ trauma.

Method: 81 patients aging from 26 to 73 y.o. underwent surgery for CVJ trauma from 2006 to 2016. Traumatic patterns included - C1 fractures (Jefferson) - 12; C2 fractures ("hangman") - 19; C2 odontoid fractures - 28; traumatic atlantoaxial dislocation - 5; combined C1 and C2 fracture - 16.

Results: Design of surgery depended on traumatic morphological pattern, time after injury, financial capabilities to use appropriate technology at the time of admission to hospital, surgeon's preference and condition of patient. We have used isolated HALO-vest brace in 17 cases; stabilization after HALO-vest brace in 29 cases (occipital-cervical fixation - 14, C2-C3 corporodesis - 15); primary stabilization operation without pre-correction by HALO-vest brace in 35 cases (occipital-cervical fixation - 8, C1-C2 screw fixation - 23, C1-C2 screw fixation after C1-C2 distraction and arthrodesis - 3, anterior odontoid screw fixation - 2). Mortality - 1 case due vertebrasilar stroke. In all other cases reliable fixation have been reached. Neither one case there was any neurological deterioration.

Conclusion: Balanced approach in making decision for treatment modalities in CVJ trauma subject availability of high technologies allows reaching reliable stabilization and good functional outcome.

Keywords: Spine trauma, Craniovertebral junction instability, Spinal fusion

EP-0399 [Spine and Peripheral Nerve » Spinal Trauma] Delayed and Neglected Presentation of Cervical Spine Injuries: Surgical Results of 18 Cases

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Background: Neglected cervical spine injuries are associated to a high rate of displacement; they can lead to severe neurological damage.

Method: We retrospectively reviewed 18 cases collected in our department from 2004 to 2014 (10 years).

Results: The average age was 33 years with a sex ratio of 8/1. The main cause of injury was represented by the road traffic accidents (80% of cases). The mean admission period was 14 days (7-30) days. Neck pain was the main reason for consultation (50%), followed by motor deficit in 27%, torticollis in 22% and cervical radiculopathy in 3 patients (16%). The lesions were located at the upper cervical spine in 6 patients and the lower cervical spine in 12 patients; different types of injuries were observed: 12 dislocations, 8 vertebral body fractures, 4 facet joints fractures, 2 pedicle fractures and 2 post-traumatic cervical disc herniation. Skull traction was applied to reduce the dislocation in 66% initially. The anterior approach was indicated after reduction and performed in 55% of patients with an anterior cervical discectomy, iliac graft and fusion by an anterior plate. The posterior approach was performed in 33%, transarticular screws or laminar hooks instrumentation was used. The approach was combined in 11% of our patients. The reduction was achieved in 94% of cases. The consolidation was achieved in all patients.

Conclusion: The overall result was excellent, successful reduction was achieved by the anterior approach but when fibrous tissues

prevented reduction; the posterior approach was preferred.

Keywords: Neglected cervical injuries dislocation, Locked facets, Anterior approach, Posterior approach

EP-0400 [Spine and Peripheral Nerve » Spinal Trauma]

Anterior Single Odontoid Screw Placement for Type II Odontoid Fractures: Our Modified Surgical Technique and Initial Results in a Cohort Study of 15 Patients

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Background: Anterior odontoid screw fixation for type II odontoid fracture is the ideal management option. However in the context of unavailability of an O-arm or neuro-navigation and poor images from the available C-arm may be an obstacle to ideal trajectory and placement of the odontoid screw. We herein detail our surgical technique so as to ensure a correct trajectory and subsequent good fusion in Type II odontoid fractures. This may be advantageous in clinical set ups lacking state of the art facilities.

Method: In this cohort study we included 15 consecutive patients who underwent anterior odontoid screw placement. We routinely dissect the longus colli to completely visualize the entire width of C3 body. We then perform a median C2-C3 disectomy followed by creating a gutter in the superior end of C3 body. We then guide the Kirchsner (K) wire purchasing adequate anterior cortex of C2. Rest of the procedure follows the similar steps as described for odontoid screw placement.

Results: We achieved 100% correct trajectory and screw placement in our study. There were no instances of screw break out, pull out or nonunion. There was one patient mortality following myocardial infarction in our study.

Conclusion: Preoperative imaging details, proper patient positioning, meticulous dissection, thorough anatomical knowledge and few added surgical nuances are the cornerstones in ideal odontoid screw placement. This may be pivotal in managing patients in developing nations having rudimentary neurosurgical set up.

Keywords: Odontoid fracture, screw placement, technique

EP-0401 [Spine and Peripheral Nerve » Spinal Trauma]

Missile Injury to the Spine Surgical Outcome and Prognosis

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Background: Treatment of gunshot spine differs from other injuries. Fractures are usually inherently stable and rarely require stabilization. In neurologically intact patients there are few indications for surgery. This study was carried out to evaluate the surgical outcome in surgical management of Missile Injuries (MIs) of the spine in comparison to a non-surgical management.

Method: The study was conducted at the Neurosurgical Department of Ibn-Sina Teaching Hospital in Mosul City from August 2011 to August 2014. This is a case series study of (60) patients with MIs to the spine who were managed in the Neurosurgical unit at Mosul Teaching Hospital.

Results: The mean age of the patients was thirty years range from eleven to fifty four years. Thirty three (55%) patients surgery was done, while the rest In twenty seven (45%) patients were managed non-surgically. The main indications for surgery were: cauda equine injury, spinal cord, nerve root compression and decompression and intraspinal bullet removal. The outcome in these groups were evaluated regarding neurological improvement and mortality. The mean follow up period was nine months. All these patients had complete radiological assessment including plain X-rays and CT scan examination of the spine of the appropriate spinal level. MRI some time.

Conclusion: Patient with incomplete neurological injuries especially in cauda equine and cervical injuries showed better surgical outcome compared to non surgical cases in comparison to non-surgical management. There were no difference between the outcome of surgical or non surgical management of complete neurological injuries of the spine.

Keywords: Gunshot, Spinal injury, Surgical management, Non-surgical management, Outcome, Prognosis

EP-0402 [Spine and Peripheral Nerve » Spinal Trauma]

Outcomes of Anterior Cervical Interbody Fusion with Using Threaded Cylindrical Titanium Cage

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Background: The problem of finding effective technology for surgery of cervical spine instability has not lost its relevance. Our aim is to evaluate outcomes of substitute technology with threaded cylindrical titanium spacer in cervical surgery.

Method: Prospective analysis was performed in 24 patients with cervical spine instability who were treated with threaded cylindrical titanium spacer. A feature of surgery consists in formation arthrodesis by threaded titanium cage insertion according to substitute technology. The cause of instability was trauma in 17 cases - (C2-C3 - 15 cases, C6-C7 - 1 case, C7-Th1 - 1 case), degenerative disc disease in 7 cases was (C4-C5 - 1 case, C5-C6 - 3 cases, C6-C7 - 3 cases). Before surgery all patients had neck pain, 10 patients had arm pain, 4 had myelopathy. Pain and disability were assessed by visual analogue scale, Oswestry Disability Index, European Myelopathy Score, Nurick Scale. Radiological evaluation included slippage reduction and fusion status. Perioperative complications, intraoperative blood loss, duration of surgery were also monitored.

Results: Duration of surgery does not exceed 60 minutes, intraoperative blood does exceed 50 ml. Follow-up period was from 1.2 to 5 years. Fusion was achieved in all cases. Radiculopathy was solved in all cases. No one case of intraoperative nerve root injury, cerebrospinal leakage, neurological deterioration, infectious complications has been marked. All groups of patients shown significant improvement ($p < 0,05$) in pain and functionality.

Conclusion: Anterior cervical interbody fusion with threaded cylindrical titanium cage is effective and save substitute technology for treating cervical spine instability.

Keywords: Spine fusion, Cervical spine, Instability

EP-0403 [Spine and Peripheral Nerve » Spinal Trauma]**Acute Atlantoaxial Rotary Subluxation in a Child**

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We report a case of an Acute Atlantoaxial Rotary Subluxation (AARS) also known as rotatory dislocation or displacement in a 4-year-old child after a head trauma because of a motor accident. The infant presented pain, torticollis ("cock-robin" position) and tetraparesis. Spine X-rays were taken, showing a left rotation. Computed tomography scan showed a Fielding and Hawkins type I Rotational subluxation of C1 on C2. The dislocation was reduced under anesthesia and stabilized with a minerva plaster jacket followed by a philadelphia collar immobilisation. Reduction was anatomical, and the neurological problems regressed within 48 hours.

Keywords: Spine, Trauma, Subluxation, Rotatory

EP-0404 [Spine and Peripheral Nerve » Spinal Trauma]**3D CT Guided Cervical Spine Injection for Severe Post Traumatic Spinal Cord Injury Induced Chronic Neuropathic Pain and Spasticity**

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Our aim is to evaluate the results of lateral facet/ periradicular cervical spine corticosteroid/ local anaesthetic injection in a patient with severe neuropathic pain and spasticity following post-traumatic compressive spinal cord injury. A patient had neck pain, bilateral brachialgia, chronic burning pain and spasticity affecting almost entire body below the neck (left > right) 4 years after a spinal cord injury secondary to a cervical fracture dislocation after an RTA. He did not have a good night sleep for even once following the RTA. After counseling about various pain management options he was offered a cervical spine injection. A 3D CT guided C5/6, 6/7 bilateral lateral facet and periradicular injection was done. He had excellent improvement in the Visual Analogue Score (VAS) from 7/10 to 0/10 within 24 hours. This improvement continued to last for 3 months. He was able to sleep without the burning pain for the first time in 4 years. When the pain recurred after 6 months, it was mild and was easily controlled with neuropathic painkillers. He also had unexpected improvement in bilateral upper and lower limb spasticity (left > right) with improvement in gait. Although the exact mechanism of action is unclear, spinal corticosteroid injections may help in dramatically improving chronic neuropathic pain following spinal cord injury, through of their ability to inhibit production of phospholipase A2 and membrane stabilizing effects. It is not fully understood how steroids improved the spasticity and therefore more research studies are warranted.

Keywords: Spinal cord injury, Trauma, Spinal injection, Corticosteroid, Spasticity, Neuropathic pain

EP-0405 [Spine and Peripheral Nerve » Spinal Trauma]**Minimally Invasive Spine Surgery + Kyphoplasty for Lumbar Fracture Correction After Trauma in a Military Parachutist: Case Report**

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Military parachutists are among the most dangerous military activities. They are submitted to daily hard exercises and weekly jumps. Although is a meticulously planned activity, accidents happen once and awhile. Here we present a case of a 48 years old male, highly trained military parachutist, who suffered an accident at landing. He was immediately evacuated to our facility for emergency surgical treatment. He presented with significant pain (VAS 10), but no neurological deficits. CT images showed a L1 compressive fracture with some degree of retro spondilolysthesis. The patient underwent MISS lumbar arthroplasty T10 to L3 and L1 kyphoplasty. After surgery he evolved very well, without any deficits, no pain and fast recovery of the mobility. A well designed rehabilitation program was conducted and the patient returned to his former military activity: parachuting. MISS lumbar arthrodesis showed as a good option for fracture correction in patients submitted to high physical demands.

Keywords: Lumbar fracture, MISS, Kyphoplasty, Military, Parachutist

EP-0406 [Spine and Peripheral Nerve » Spinal Trauma]**Treatment of Occipital Condyle Fractures**

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Occipital Condyle Fractures (OCFs) are rare injuries. The surgical treatment has been controversial. From 2012 to 2017, 25 patients with OCFs were identified. Fracture and patient characteristics, including patient age and sex, Anderson and Montesano fracture type, bilaterality, associated head injury, and fracture displacement, were noted. Seven patients were died because of secondary to their association with fatal injuries. We followed up eighteen patients one year after the trauma. None of them had pseudo arthrosis in CT scan evaluation during that year. The Neck Disability Index (NDI) was calculated at final follow-up. Our results will be discussed by the recent publications

Keywords: Occipital condyle fractures, Neck disability index, Trauma

EP-0407 [Spine and Peripheral Nerve » Spinal Trauma]**Expediency of Minimally Invasive Stabilization in Thoracic and Lumbar Regions Injury**

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Aim: To evaluate the minimally invasive percutaneous transpedicular stabilization of thoracic and lumbar regions.

Method: There were 23 patients with traumatic fractures of thoracic and lumbar regions who underwent percutaneous transpedicular stabilization (9 male and 14 female) (2013-2016). The average patient's age was $53,15 \pm 18.01$ years. Thoracic injury was diagnosed in 3 cases, lumbar injury – in 9 cases, thoracic-lumbar (Th12-L1) – 11 cases.

Results: All surgeries were made successfully. We got correct positioning of stabilized elements. We achieved minimally invasive surgery compared with traditional “open” surgery. All patients were activated in day of surgery. We found that after minimally invasive stabilization all patients got stronger back pain to compare with traditional “open” stabilization. We think that it could be because of iatrogenic injury of Luschka's nerve during “open” surgical treatment. By the way, during percutaneous minimally invasive surgery this nerve stayed unhurt and compressed by stabilization system joist. Also during percutaneous minimally invasive stabilization we make much more intraoperative pictures by X-ray C-arm for correct stabilization system fixation in comparison with “open” stabilization.

Conclusion: Using minimally invasive stabilized methods gives us opportunity to decrease soft tissues traumatization, to minimize bleeding and making less staying in hospital for patient. But, in earlier postoperative period the vertebrogenic back pain is stronger, doctor and patient got bigger X-ray dose exposure, the cost of stabilization system and delivering of minimally invasive system of stabilization is much more bigger than traditional system.

Keywords: Thoraco-lumbar, Spine trauma, Stabilisation

EP-0408 [Spine and Peripheral Nerve » Spinal Trauma]

Evaluation of Efficacy of Percutaneous Screw Stabilization of Unstable Fractures for Thoraco-Lumbar Spine

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Background: The occurrence of thoracolumbar spine injuries has increased over the past few decades as a result of due to high speed Motor Vehicle Accidents. Surgical management of these injuries has traditionally been by open means with instrumentation and fusion. Percutaneous pedicle fixation has been shown to be an effective and safe option.

Method: The aim of this study is to evaluate the efficacy and safety of minimally invasive percutaneous pedicle screw fixation for unstable burst thoracolumbar fractures with or without neurology. Over 18 months, we did 16 case of thoracic and lumbar spine. There were 12 male and 4 female patients. The average age was 42.14 years. All of these patients were treated with closed reduction and percutaneous stabilization by screw and rod.

Results: All of these patients showed stable fixation and no loss of reduction of thoracic and lumbar spine in follow-up at 12 months. Their blood loss was also found to be minimal. The average stay in hospital was 3 to 4 days. There was no case in which neurology was worsened.

Conclusion: Percutaneous pedicle screw fixation has been an attractive alternative to typical open techniques. This offers a safe,

less invasive, less traumatic, more aesthetically acceptable method for performing fusion. The other advantage of the procedure is short hospital stay and less bleeding. In our patients we achieve good results with this method. All of our patients had less pain post-operatively; therefore they could mobilize early and subsequently an early discharge.

Keywords: Thoracolumbar spine fracture, Percutaneous pedicle screw fixation, Burst fractures

EP-0409 [Spine and Peripheral Nerve » Spinal Trauma]

Complications at Transpedicular Fixation of the Thoracic and Lumbar Part of the Spine Column

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Background: The last decennial event in spinal surgery the most broad spreading has got the method an transpedicular fixation of the spine (TPF). However was currently accumulated quite a number of the complications, in accordance with use of this method. The complications cause breaches the supporting, motor and defensive function of the spine, can bring about neurological and inflammatory complications. The Purpose of the study is to study mistake and complications when performing TPF of spine.

Method: In neurosurgical department of our centre for 2012-2016 was performed 106 operations with use the transpedicular fixation systems of the spine on thoracic and lumbar part of the spine. The men 76, women - 30. The age patient from 17 to 45 years. For stabilization were used titanium designs production company ChM and their license analogues. Trauma of dura was noted beside 33 patents (31,1%). In lumbar division 12 patients, in thoracic - 19.

Results: Entering the screw in intravertebral disk or with breach of the paths was noted beside 5 sick (4,7%). The Breach to wholeness metallic design was distributed as follows: fractures screw - 2 (1,8%), offset supporting plug - 4 (3,7%). The offset and migration supporting plugs can be conditioned constructive particularity TPF and breach of the technology of fixation supporting plugs. Epidural fibrosis with steadfast by root syndrome is revealed in 2 patients. The infectious complications is revealed in 4 patients (4,2%). Radiculopathy was noted on 6 patients (6,25%), more often existed under TPF thoracic part of the spine.

Keywords: Transpedicular fixation, Spinal surgery, Epidural fibrosis

EP-0410 [Spine and Peripheral Nerve » Spinal Trauma]

Retrospective Analysis of a Case Series of Patients with Traumatic Injuries to the Craniocervical Junction

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Aim: To evaluate the correlation between treatment, characteristics of the lesions and the clinical outcome of patients with traumatic injuries to the craniocervical junction.

Method: This was a retrospective study of patients treated conservatively or surgically between 2010 and 2013 with complete data sets.

Results: We analyzed 37 patients, 73% were men with mean age of 41.7 years. Among those, 32% were submitted to initial surgical treatment and 68% received conservative treatment. Seven (29%) underwent surgery subsequently. In the surgical group, there were seven cases of odontoid type II fractures, two cases of fracture of posterior elements of the axis, one case of C1-C2 dislocation with associated fractured C2, one case of occipitocervical dislocation, and one case of combined C1 and C2 fractures and facet dislocation. Only one patient had neurological deficit and it improved after treatment. Two surgical complications were seen: a liquoric fistula and one surgical wound infection (reapproached). In the group treated conservatively, odontoid fractures (eight cases) and fractures of the posterior elements of C2 (five cases) were more frequent. In two cases, in addition to the injuries of the craniocervical junction, there were fractures in other segments of the spine. None of the patients who underwent conservative treatment presented neurological deterioration.

Conclusion: Although injuries of craniocervical junction are relatively rare, they usually involve fractures of the odontoid and the posterior elements of the axis. Our results recommend early surgical treatment for type II odontoid fractures and ligament injuries and the conservative treatment for other injuries.

Keywords: Craniocervical injuries, Injuries classification, Craniocervical surgery

EP-0411 [Spine and Peripheral Nerve » Spinal Trauma]

Percutaneous Transpedicular Screw Fixation in Thoracolumbar Traumatic Fractures: 1-Year Follow-Up Results

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Background: The transition from the less mobile thoracic spine with its associated ribs and sternum to the more dynamic lumbar spine subjects the thoracolumbar region to significant biomechanical stress. Minimal invasive spine surgery developed from dissatisfaction of excessive exposure, postoperative pain or scarring. Thus, percutaneous surgery, by sparing the paravertebral musculature, should limit bleeding, reduce infection rates and postoperative pain, which would reduce the length of hospital admission, makes rehabilitation easier and faster and could limit the destabilization of adjacent levels over the long term.

Method: Although minimally invasive spinal surgery requires suitable instrumentation, we present the case when adjustment of surgical techniques, with delicacy and refinement, enabled the creation of a minimal invasive spinal surgery with classic instrumentation. We present our study of 19 patients with thoracolumbar fractures treated in our hospital in the last years and the follow-up results at 1 year.

Results: Despite the fact that for percutaneous fixation we used classical surgical instruments, we obtained similar results with those obtained in international studies using "adequate" instruments for percutaneous pedicle screw fixation. In our study patients treated with percutaneous fixation had less operative time, blood loss, less postoperative pain (VAS and Denis Scale) less hospital stay and we didn't have any infection-related complications.

Conclusion: Despite that fact that we used, inappropriate" instruments for percutaneous minimally invasive posterior pedicle screw fixation we obtained similar results with other reported data. Percutaneous surgery aims fewer soft tissue injuries and post-op results as good or better, compared with open, posterior approach.

Keywords: Screw, Fixation, Fracture

EP-0412 [Spine and Peripheral Nerve » Spinal Trauma]

Prognosis of the Spinal Cord Injury in the Patients with Cervical Canal Stenosis: Evaluation of 15 Consecutive Cases

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Background: Spinal canal stenosis is a well-known risk factor for spinal cord injury. There are controversial findings on prognosis in literature.

Method: Fifteen patients were evaluated retrospectively. Improving of the neurological deficits was accepted as good prognosis and mortality and neurological deficits that did not change were accepted as worse prognosis.

Results: All patients were male and they were 44 to 85 years old. High energy traumas caused to injury in 7 cases, and low energy traumas in others. Nine cases had central cord injury, and 6 had other types. One patient did not accept operation and two others could not be operated because of their general status. Other 12 patients were decompressed 0 to 40 days after trauma. Two other patients with complete transverse type cord injury also died. Other patients were followed for 1 to 48 months (22,7±17,7). In one patient, neurological deficits did not improve 31 months after operation. Deficits were completely or partly improved in other patients including the one who did not accept operation. Central cord injury had significantly better prognosis than other types (p=0,0019). Age, cervical canal diameter, and motor and sensory scores of American Spinal Injury Association scale, were not significantly different in the patients with good and worse prognosis.

Conclusion: Central cord syndrome had good prognosis in the patients with spinal cord injury associated cervical spinal stenosis even in the patients who were not decompressed. However, other types of spinal cord injuries such as transverse and motor types had worse outcome.

Keywords: Central cord syndrome, Cervical spinal stenosis, Spinal cord injury

EP-0413 [Spine and Peripheral Nerve » Spinal Trauma] Surgery for Fractures of the Odontoid Process C2

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Aim: To determine the effectiveness of stabilization segment C1-C2 by Harms.

Method: 21 patients with odontoid process fracture (type II), were operated at the Vinnitsya regional neurosurgical department. The average age of patients was $53,7 \pm 13,4$ years. Screws were placed transpedicularly in C2 and C1 lateral mass usually bicortically. Evaluated the quality of life of patients before and after surgery using a visual analogue scale and neck disability index (NDI). Before and after surgery performed CT and assessed quality installation of stabilization system, after 6 months perform CT control to assess the fusion of the odontoid process to the body C2 vertebra.

Results: Before surgery NDI was 48% in the first day after surgery - 34%, after 1 month - 17%, after 6 month - 13%. Before surgery VAS score was 7,5 points, immediately after the operation - 6.2 points, after month - 2 points, after 6 months - 0.3 points. According to CT, after 6 months, we saw odontoid process bone fusion. There were no intraoperative complications.

Conclusion: The method Harms is effective and safe for the odontoid process fractures stabilization. After 1 month, patients almost not have pain, improve the level and quality of life. The method of Harms provides quality stabilisation segment C1-C2 and fusion of C2 vertebral body.

Keywords: C2 odontoid process, Fracture, Surgical treatment

EP-0414 [Spine and Peripheral Nerve » Spinal Trauma] A Rare Injury - Even Rarer Presentation

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Authors were involved in the management of a 67 year old male cyclist who sustained injury resulting in to Atlanto-occipital dislocation. He presented to the department in a relatively good condition however the events that followed his initial accident were exceptional. He also had multiple co-morbidities that made his management more challenging than expected. The authors would like to share their experience of managing this patient with the review of literature.

Keywords: Atlanto-occipital dislocation, Occipito-cervical fusion, Cyclist, Injury

EP-0415 [Spine and Peripheral Nerve » Spinal Trauma] Experience of a Single Center with 472 Vertebral Augmentation Surgery in 356 Patients

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Background: The objective of this study is to evaluate the clinical

series of patients who underwent vertebral augmentation surgery in Neurosurgery department of Başkent University.

Method: The medical data stored in electronic and print files were retrospectively analyzed and patients operated in recent past were called for evaluation of outcome.

Results: One clinical; pain relief and two radiologic; kyphotic angle and vertebral compression, criteria were used to evaluate the final outcome. The statistical analysis revealed that in all three parameters there was significantly important improvement in postoperative values. Procedure related complications were minor. No permanent neurologic deficit or mortality was seen.

Conclusion: Both vertebral augmentation techniques are simple, effective and safe procedures provided that surgical indications are correct and surgical technique is properly carried out.

Keywords: Vertebral fracture, Kyphoplasty, Vertebroplasty

EP-0416 [Spine and Peripheral Nerve » Spinal Trauma] Stabilization of the Thoraco-Lumbar Segment of the Spine. Long or Short Construction?

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Aim: To determine the features of transpedicular stabilization in the fractures of the thoraco-lumbar junction of the spine.

Method: We operated 90 patients with unstable fractures of the thoraco-lumbar spine as a result of traumatic injury (Th11, Th12, L1, L2 vertebrae).

Result: L1 vertebrae were found to be most often fractured-34%, L2-21%, Th12-27% and Th11 injured in 9% of patients. Rarely fractures were detected at two levels of L1-L2 3% of the patients, 2% observations-Th11-Th12 and Th12-L1. More than 3 vertebrae in 2% patients. 20% of patients had total damage of the spinal cord function-Frankel A, B-2%, C-6%, D-22% and E -50% of patients. Open surgery was performed in 86,6 % of cases, percutaneous stabilization was performed in 13,4%. 63% of the patients were affected by stabilization at 4 levels-2+2 (two levels above the fracture, two levels below the fracture), at 2 levels 1+1 (one level higher, one level below the fracture) in 34% of patients, at three levels 1+1+1-3% of patients. Vertebroctomy was performed in 14% of patients, 25% of patients underwent fixation of the segment by 1+1 construction, and 75% - 2+2.

Conclusion: Fixation of unstable damage to the thoraco-lumbar junction by a 1+1 type structure, the mobility in the segment progressively increases, so stabilization of 1 + 1 is justified provided that the anterior column support is restored by interbody fusion after resection of the damaged vertebra. The greatest stabilizing effect was achieved when fixing the damaged segment according to the 2 + 2 principle.

Keywords: Thoraco-lumbar level, Spinal fracture, Surgery

EP-0417 [Spine and Peripheral Nerve » Spinal Trauma] Modified Transpedicular Approach for Treatment of Severe Thoraco-Lumbar Burst Fractures: A Technical Note

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Aim: To describe a modification of transpedicular approach by which neural canal decompression can be done with minimal disruption of the spinal stability after burst fracture.

Method: A hand controlled drill is used percutaneously from side in such a trajectory that the tip of the drill reaches the retro pulsed fragment anterior to the cord through the intervertebral foramina or posterior part of the body. A small part of the pedicle is resected and retro-pulsed portion of the fractured body is removed. Stabilization with pedicle screw and reconstruction of the vertebral body by packing bone chips were done after this decompression procedure in all the 32 patients included in this study.

Results: All the patients showed different degrees of neurological improvement. Post operative imaging showed decompression of the canal in all the cases. Conventional transpedicular decompression of the neural canal requires a considerable amount of lamina, facet joint and pedicle resection. This procedure requires larger bone graft or cage to reconstruct the vertebral body. By the modified transpedicular approach it is possible to remove the retro pulsed bone fragment with minimal destruction of the vertebral elements contributing to spinal stability. Most of the natural bone is preserved and vertebral height is restored by distracting the endplate and the gap is packed with autogenous bone chips for fusion followed by stabilization by pedicle screw.

Conclusion: The modified transpedicular transforaminal approach is a new, simple and less-traumatic technique for treatment of thoracolumbar fracture through posterior approach with good outcome.

Keywords: Thoraco-lumbar injury, Burst fracture, Transpedicular approach

EP-0418 [Spine and Peripheral Nerve » Spinal Trauma]

Application of Diffusion Tensor Imaging in the Prognosis of Outcome After Traumatic Cervical Spinal Cord Injury

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Aim: To evaluate the usefulness of Diffusion Tensor Imaging (DTI) in the acute assessment of patients after cervical traumatic spinal cord injury (tSCI).

Method: Five cervical tSCI patients were prospectively enrolled into the study. Neurological examination was followed by the MRI scan with DTI recording fractional anisotropy (FA) and apparent diffusion coefficient (ADC) to the injured segments of the cervical spine. Obtained values were compared to the reference (healthy volunteers) by mean of statistical analysis.

Results: The FA correlated negatively with the ASIA motor score (-0.90, $p=0.037$) and severity of neurological deficits (ASIA type A-E) (-0.95, $p=0.014$). The ADC was positively correlated with ASIA motor score for upper limbs (0.86, $p=0.046$). Two patients found with ADC higher than the reference presented early neurological recovery.

Conclusion: DTI appears to be useful in the early assessment of tSCI. The FA reflects functional status of the spinal cord whilst ADC may serve a potential prognosticator.

Keywords: Spinal cord injury, Diffusion tensor imaging, SCI, DTI

EP-0419 [Spine and Peripheral Nerve » Peripheral Nerve]

Is Trauma an Etiological or Prognostic Factor in Adolescent Peroneal Intra-neural Ganglion Cysts? A Case Report

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Intra-neural ganglion cysts (IGCs) are cystic masses containing mucinous fluid localized in the epineuria of peripheral nerves. Their etiopathogenesis remains controversial. A 17-year-old male patient experienced an onset of pain in the left knee 14 months prior from a bicycle accident, and the pain worsened. A knee graph obtained at the emergency unit where he was admitted evaluated to be normal. Three months after the trauma, he was unable to raise his left foot and was taken to the emergency unit again. Afterward, the patient was referred to our clinic. Examination revealed a muscular strength of 0/5 during the dorsiflexion of the left foot and extension of toes, eversion strength of 2/5, and a hypoesthesia anterolateral inferior left leg. The Tinel's sign was negative over the fibular head level. EMG revealed almost complete axonal damage in the peroneal nerve (PN). Cystic lesion was detected in the knee magnetic resonance imaging. Decompression was performed and the patient's pain complaints ceased. However, loss of sense and strength persisted. Reinnervation was not detected in the EMG performed in the postoperative 12th month. Ultrasound USG showed the cyst to have recurred. In our case, the trauma was responsible from prognosis rather than etiology. In cases with knee pain, which is the earliest complaint, peroneal IGCs should be considered for differential diagnosis. Since superficial localization of the PN and predisposition to trauma in adolescence may cause irreversible nerve damage and worsen the prognosis.

Keywords: Adolescent, Etiology, Intra-neural ganglion, Peripheral nerve cyst, Peroneal nerve, Trauma

EP-0420 [Spine and Peripheral Nerve » Peripheral Nerve]

Effects of Local and Systemic Application of Erythropoietin After Transection and Crush Type Peripheral Nerve Injuries

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Aim: To investigate the histopathological and biochemical effects of topical and systemic administrations of erythropoietin (EPO) on crush and transection type peripheral nerve injuries in an experimental rat model.

Method: 128 female Wistar-Albino rats were allocated to 8 groups ($n=16$ for each group) according to the route of administration of EPO (local/systemic) and type of peripheral nerve injury (crush/transection). Group I received local isotonic saline injection after crush injury; Group II underwent local EPO administration for crush injury; Group III had intraperitoneal isotonic saline injection after crush injury; Group IV received intraperitoneal EPO injection for crush injury; Group V had local isotonic saline

injection for transection injury; Group VI received local EPO for transection injury; Group VII underwent intraperitoneal isotonic saline for transection injury and Group VIII had intraperitoneal EPO for transection type peripheral nerve injury. Histopathological alterations and tissue levels of IL-1 β , IL-6 and IL-10 were compared between groups.

Results: Groups receiving EPO either locally or intraperitoneally revealed less scar tissue formation index, lower number of inflammatory cells, reduced number of perineural fibroblasts and increased number of axons ($p < 0.001$ for all). Levels of IL-1 β and IL-6 were lower and IL-10 levels were higher in groups receiving EPO locally or intraperitoneally ($p < 0.001$). Type of peripheral nerve injury (crush or transection) did not seem to affect the outcomes.

Conclusion: Our results indicated that EPO may have a promising potential for crush or transection type of peripheral nerve injuries. Dose, route of administration and indications should be elucidated in further trials.

Keywords: Peripheral nerve, Injury, Crush, Erythropoietin, IL-1 β , IL-10

EP-0421 [Spine and Peripheral Nerve » Peripheral Nerve]

Surgical Strategies in Treatment of Brachial Plexus Traction Injuries: Class I Evidence Based Choice or Matter of Intraoperative Findings and Experience

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Background: Reconstructive surgery of the brachial plexus traction injuries is very challenging problem due to difficult determination the level and the extension of the injury, unfavorable prognosis, uncertain recovery, long time span for nerve regeneration, reduction of Schwann tubule caliber in distal nerve ends, muscle atrophy and fibrosis.

Method: The aim of this study is to describe results of different strategies which are used to treat the patients with different clinical presentation of the brachial plexus lesion following traction injuries.

Results: In complete brachial plexus palsy results which should be expected vary from 49 to 80% of cases, according to the literature and our experience. In upper brachial plexus palsy range of useful functional recovery goes from 59 to 100%. In lower brachial plexus palsy distal nerve transfers can obtain useful functional recovery in selective cases.

Conclusion: One of the crucial factor for gaining satisfactory functional recovery after surgery of the brachial plexus due to traction injuries includes the technique which is used. There is no Class I evidence based proof which can determine definitive choice of surgical technique. Although some of the techniques have certain advantages and disadvantages, surgeon still has "to flip the coin" sometimes and to decide which technique should be used in each individual case intraoperatively, according to the intraoperative findings and experience.

Keywords: Surgical strategy, Brachial plexus traction injuries, Useful functional recovery

EP-0422 [Spine and Peripheral Nerve » Peripheral Nerve]

Brachial Plexus Surgery: Lessons Learned within 25 Years of Practice

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Background: Brachial plexus injuries are very destructive and debilitating. Not only motor and sensory deficit, but also pain and functional limitation can have a significant impact on quality of life. These injuries usually affect young people who are capable for work and represent big socioeconomic problem. One of the most important lessons learned in the past period is importance of patient satisfaction, ability and disability, as well as quality of life.

Method: This study included 485 patients who were operated in Clinic for neurosurgery Clinical center of Serbia during 25 years period, from 1989 to 2014 due to brachial plexus traumatic injury. Definitive results were estimated two years following surgical treatment.

Results: Useful functional recovery was obtained in 92.7% of cases with neurolysis, in 86.7% of cases with transplantation and in 74.5% of patients with nerve transfers.

Conclusion: The treatment of brachial plexus injuries has evolved over recent decades. Many new procedures have been incorporated with known ones, allowing a better functional recovery after surgical approaches to treat these severe injuries. Combined use of donor nerves in reinnervation of the musculocutaneous or axillary nerves results with high rate and better quality of recovery when compared to the other modalities of nerve transfer. Although some wrist and finger movement may occasionally be achieved by the current method of neurotization, the result of restoration of useful hand function is still far from satisfactory with possible solution in progress

Keywords: Brachial plexus surgery, Lessons learned, Patient satisfaction, Disability and quality of life

EP-0423 [Spine and Peripheral Nerve » Peripheral Nerve]

Repair of Peripheral Nerve Injury-My Experiences

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Management of the patient with a peripheral nerve injury should be based on a sound knowledge of the underlying anatomy, nerve injury classifications, pathophysiology and medical management. I observe in my experiences early and late surgery, outcome of patients mostly depends on. Post injury rehabilitation and post surgery physiotherapy also play vital role of outcome of patients. The management of peripheral nerve injuries has been made enormously easier by the classification of these injuries by Seddon and Sunderland. The physiotherapist can maximize outcomes with intervention approaches by maintaining a strong awareness of these critical areas. The peripheral nerve structure and blood supply represent two important elements for understanding surgical interventions and post-operative treatment. Following surgery, the physiotherapist plays a significant role in the recovery of function.

Movement to prevent tethering of the surgically repaired nerve is imperative, but ischemia and excessive elongation must be avoided. Now a days we neurosurgeons are busy with brain and spine surgery but nerve injury surgeries are also most important part in our subject which make a disable patient to able to perform daily activities smoothly.

Keywords: Nerve injury, Repair, Physiotherapy

EP-0424 [Spine and Peripheral Nerve » Peripheral Nerve]

Detection of Damage Brachial Plexus Using Intraoperative Neuromonitoring. Experience of Almaty (Kazakhstan)

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Background: Damage of the brachial plexus (BP) takes a special place among the trauma of the upper limb, also in peripheral nervous system. Disability with brachial plexus injury (BPI) is more than 85%. According to statistics, people of working age make up 70-75%. During microsurgical operations on the brachial plexus difficult to find damaged branches, as they may be surrounded by scar tissue. In this study we show our experience of using intraoperative neuromonitoring (IOM) during the operations on brachial plexus.

Method: We analyzed clinical cases of BPI at the Department of peripheral nerves surgery in the City Clinical Hospital №7 of Almaty. The period of research is 2 years (2015 – 2016 yy). Neurosurgical treatment included: the restoration of trunks BP and neurotization of trunks BP. IOM has been used at the step of separation nerve trunks of the brachial plexus, by direct somatosensory evoked potentials (stimulation with 10-12 mA).

Results: Total number of patients was 30 (male - 25, female - 5). Types of surgery that we used: autotransplantation 16% (5 patients), external/internal neurolysis 63% (19 patients), nerve suture 3% (1 patient), neurotization 18% (5 patients). As a result of treatment clinical improvement occurred in 42 % (with partial or complete interruption of nerve) and in 75% (with compressing, traction damage, cicatricial process).

Conclusion: Results of surgical treatment depends of BP damage nature. IOM helps find the damaged trunks of the BP and intraoperative stimulation improves clinical outcome.

Keywords: Intraoperative neuromonitoring, Brachial plexus injury, Neuropathic pain, peripheral nerve surgery, Peripheral nerve disorders

EP-0425 [Spine and Peripheral Nerve » Peripheral Nerve]

Epidemiology and Estimated Cost of Surgery for Cubital Tunnel Syndrome Conducted by the Unified Health System in Brazil (2005-2015)

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Background: cubital tunnel syndrome (CTS) is responsible for one of the types of ulnar nerve neuropathy and is the second cause of compressive neuropathy of the upper limb, only surpassed by carpal tunnel syndrome. Background: it is to describe the epidemiological data of the surgical code ulnar nerve transposition in the treatment of CTS, performed by the Unified Health System (SUS) from 2005 to 2015.

Method: this is a descriptive epidemiological study, which data were obtained through consultation based on data provided by DataSus.

Results: 774 procedures were performed during this period, despite the increase of 20.3 million people in the Brazilian population showed an incidence of 0.33 / 1,000,000. National and international epidemiology point to a slightly higher prevalence of the procedure between men, in the fourth and fifth decades of life. Low permanence rate, as well as the absence of hospital deaths related to the procedure infers that the procedure is safe with low morbidity and mortality rates.

Conclusion: the annual incidence of the cubital syndrome in Brazilian population submitted to surgical treatment for the period 2005 by SUS was 1/ 7.670.833 and 2015 was 1/ 2.174.468. The values spent in each surgical procedure during the same period range from R\$ 318.88 to R\$ 539.74. There was an average of 1.85 days of hospital stay for the realization of CTS surgery.

Keywords: Epidemiology, Cubital syndrome, Costs

EP-0426 [Spine and Peripheral Nerve » Peripheral Nerve]

The Effects of Crosslinked High Molecular Weight Hyaluronic Acid on Perineural Scar Formation After Peripheral Nerve Surgery

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Background: In this work, we analyzed the efficiency of crosslinked high molecular weight hyaluronic acid (HA gel) in perineural scar formation after peripheral nerve damage.

Method: 40 adult rats are used in this work. immediately primary anastomosis with 8/0 prolene together with the fraction by micro-scissors is done to right sciatica nerve. in following, the rats are divided into 4 groups. in group 1 no material was applied to the distance after the formation of nerve damage and reparation, in group 2 topical 0.9% NaCl was applied to the distance, in group 3 hyaluronic acid and in group 4 HA gel was applied.

Results: At the end of the sixth week, rats were sacrificed. Before the rats were sacrificed, sciatica function index works done. After sacrificed, histopathological analysis were done. nerve cohesiveness, nerve participation, fibrosis and scar formation index were statistically significant in group 4, fibroblasts and number of inflammatory cell were less in group 3 according to other groups. however in sciatica function index values, adhesion and axonal organization values, there were not statistically significant difference.

Conclusion: This work shows that after application of HA gel peripheral nerve disconnection an repair has positive effects in decreasing fibrosis. Results of this work and the further investigations will have an application in clinic practice.

Keywords: Crosslinked high molecular weight hyaluronic acid, Hyaluronic acid, Peripheral nerve, Scar formation

EP-0427 [Spine and Peripheral Nerve » Peripheral Nerve] Missed and Iatrogenic Nerve Injuries - Importance of Clinical Examination. Case Reports

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Injuries to the upper extremity are common. However, injury to the main nerves in the upper extremity is less common, but can be a substantial problem for the patient. Nerve injuries could be primary, caused by the injury and missed, or secondary, iatrogenic, caused by the surgeon e.g. during fracture fixation. Immediate nerve repair is the preferred method. We present two cases of missed nerve injuries (ulnar and median nerves) and two cases of iatrogenic nerve injuries (radial nerve). All nerves were reconstructed, between 1-3 months after the injury, with sural nerve grafts. Our scope is not to present the outcome after late nerve reconstruction, but to focus on the importance of avoiding late nerve reconstructions if possible by a thorough clinical examination. In a busy A&E department, a small cut from a sharp object could easily be overlooked if not correctly examined. On the other hand, by anatomical knowledge simple and complicated fractures can be treated properly by avoiding vital nerve structures. A meticulous examination, both of sensory and motor functions, after a trauma to the upper extremity is mandatory and an exploration of the wound is necessary if a nerve dysfunction is found. If surgery is performed in the area of a nerve one should consider to explore and isolate the nerve trunk before e.g. osteosynthesis of a fracture.

Keywords: Peripheral nerve injury, Iatrogenic, Examination

EP-0428 [Spine and Peripheral Nerve » Peripheral Nerve] Recovery Period Following Nerve Transfer and Grafting in Traumatic Brachial Plexus Injuries

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Background: The clinical management of the brachial plexus injuries is very challenging especially when the patient aims to restore the full motor power to return back his usual lifestyle. Our aim is to show the recovery period for patients who have traumatic brachial plexus injuries and treated surgically with nerve transfer and nerve grafting techniques.

Method: Between January 2013 and April 2016, the team operated twelve patients who traumatic brachial plexus injuries and treated with nerve transfer and nerve grafting. The patients were followed up each three months up till now. Recovery of the motor power is evaluated using the MRC scale.

Results: Twelve patients (12 males) were treated by surgical intervention, seven cases were treated by nerve transfer and five cases were treated by nerve grafting. Age is ranged from 20 years to 42 years with a mean of 31 years. Nine patients presented with upper

brachial plexus injuries, two presented with pan brachial plexus injuries and one by lower brachial plexus injury. Nine cases gained functional recovery, one case improved but not useful recovery, one case did not improved uptill now and one case died post operatively after 4 months of ICU admission. Average of recovery period in nerve grafting is 19 months, while 8 months in nerve transfer.

Conclusion: Nerve transfer and nerve grafting are effective surgical techniques in treating the brachial plexus injuries but the recovery period in nerve transfer is much less than that in nerve grafting.

Keywords: Traumatic brachial plexus, Nerve transfer, Nerve grafting, Recovery period

EP-0429 [Spine and Peripheral Nerve » Peripheral Nerve] Neurorrhaphy Results After Traumatic Nerve Injury

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Aim: To determine the level of recovery of medial nerve (MN) and ulnar nerve (UN) in 6 months after surgery.

Method: Were operated 19 patients with damaged MN and UN during two years. 15 men, 4 women. Mean age 42 years. Injury MN - 7, UN - 8, both MN and UN - 4 (21%). The average time from the moment of trauma 3 months. All patients were surveyed to determine the level of disability by Bishop functional recovery scale. Level of damage: arm 2, elbow 1, forearm 12, wrist 3, palm (hand) 1.

Results: Pain in the area of nerve injury were in 90% cases before surgery. After surgery in 58.4% pain was completely absent. Night pain observed in 16.6% of patients, daily pain in 25%. Before surgery anesthesia was in 36,8% of patients, hypoesthesia 63,2%. In 6 months after surgery anesthesia was not observed, hypoesthesia - 58,3% patients. No patients with anesthesia. No patients with severe and moderate pain. According Bishop scale assessment excellent recovery (7-10 points) was at 26.4%, good (7-9 points) - 52.6%, bad (<7 points) - 21%. The best Bishop results observed in patients operated from 3 weeks to 3 months after injury.

Conclusion: Most patients were satisfied of surgery results. But still more than 21% have nonsufficient results. The Bishop scale was good option for estimation nerve surgery results.

Keywords: Neurorrhaphy, Bishop scale, Recovery

EP-0430 [Spine and Peripheral Nerve » Peripheral Nerve] Effects of Topically Administered Contractubex on Epidural Fibrosis and Axonal Regeneration in Damaged Rat Sciatic Nerve

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Background: Contractubex (Cx) is an antifibrotic compound

consisting of mixture of extractum cephea, heparin and allantoin, which is frequently used in the treatment of keloids. Formation of excessive fibrosis, which results in neuroma in peripheral nerve injury, is the most serious obstacle to the axonal regeneration process. In this study, we wanted to investigate the effects of Cx on epineural fibrosis (EF) and axonal regeneration (AR) on rat sciatic nerve model (RSNM).

Method: Twenty-four Sprague-Dawley rats were used in the study, incision was made in the right sciatic nerves, followed by primary epineural anastomosis. Scar formation index (ScFI), sciatic function index (SFI), electrophysiological imaging (EMG), axon number (AN), axonal area (AA), score of 5 (5S), myelin thickness (MT), wound healing and nerve adhesion (NAD) parameters were measured at 4th and 12th weeks.

Results: 4th Week: ScFI: Control Group (CG): $2, 17 \pm 0,753$; Contractubex Group (EG): $3 \pm 1,095$; SFI: CG: $\% -78,731 \pm 2,133$; EG: $\% -76,611 \pm 1,938$. EMG: distal latency; CG: $0,233 \pm 0,753$; EG: $0,212 \pm 0,445$; amplitude; CG: $338,33 \pm 22,286$; EG: $385,00 \pm 30,166$. AN: CG: $5260,6682 \pm 1460$; EG: $9550,4508 \pm 3904$. AA: CG: $8,628 \pm 0,975$; EG: $11,846 \pm 1,79$. 5S: CG: $2,17 \pm 0,753$; EG: $3 \pm 1,095$. MT: CG: $0,775 \pm 0,524$; EG: $0,898 \pm 0,814$. NAD: CG: $2,50 \pm 0,548$; EG: $1,33 \pm 0,516$. 12th Week: SFI: CG: $-64,570 \pm 1,644$; EG: $-48,961 \pm 2,981$. EMG: distal latency; CG: $0,200 \pm 0,044$; EG: $0,131 \pm 0,027$; amplitude: CG: $410,00 \pm 26,833$; EG: $500,00 \pm 31,623$. AN: CG: $8353,535 \pm 2697,089$; EG: $12944,06 \pm 902,937$. AA: CG: $13,346 \pm 0,949$; EG: $16,0500 \pm 1,376$. 5S: CG: $2,33 \pm 0,816$; EG: $3,50 \pm 8,837$. MT: CG: $0,953 \pm 0,630$; EG: $1,233 \pm 0,218$. NAD: CG: $2,33 \pm 0,816$; EG: $1,33 \pm 0,516$. In the literature; Cx, which has been proven in various experimental and clinical studies to have anti-fibrotic activity without affecting wound healing, has been associated with this activity, particularly the extractum cephe component. Our study also showed positive effects on AR and functional recovery, in the context of histopathological and electrophysiological evidence. We believe that this effect, which we primarily associate with the antifibrotic property of extractum cephea, is enhanced by heparin and allantoin.

Conclusion: Topical Cx administration increased AR and functional recovery by preventing EF formation in RSNM.

Keywords: Rat, Sciatic nerve incision, Anastomosis, Fibrosis, Contractubex, Regeneration

EP-0431 [Spine and Peripheral Nerve » Peripheral Nerve]

Results of the Open Carpal Tunnel Release in Elderly People

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Background: The stepladder steps of treating the carpal tunnel syndrome is a conservative treatment followed by surgical options either standard open surgery or endoscopic maneuver if the conservative treatment failed or neurological deficit appears. Nevertheless, the surgical intervention outcome in elderly is questionable. Moreover, elderly people are less convinced with the outcome of the surgical option. Explaining the results to elderly patients should be done before the surgery. The aim of the study is assessment of the carpal tunnel release in the elderly patients regarding pain relief and the functional outcome.

Method: A prospective study in the neurosurgery clinic in sohag University hospital for the elderly patients with carpal tunnel entrapment. Detailed medical history was taken. The diagnosis was confirmed by the electrophysiological studies. The open surgical release was done for all patients who do not respond to conservative treatment or who have a neurological deficit from the start. They were followed up for six months postoperatively.

Results: Twenty-four elderly patients were involved in these study. 70.8% females and 29.2% males, all of them showed a marked improvement after the open surgical release regarding pain and functional outcome.

Conclusion: Open surgical release would be the best management option for the carpal tunnel syndrome in the elderly patients who are not responding for the conservative treatment, although some of them were not satisfied with the surgical release.

Keywords: Carpal tunnel, Elderly people, Open release, Entrapment neuropathy, Pain relief

EP-0432 [Spine and Peripheral Nerve » Peripheral Nerve]

Femoral Nerve Schwannoma Misdiagnosed as an Inguinal Herniation: A Case Report and Review of the Literature

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Schwannomas with neurofibromas are the two main neurogenic tumors derived from the peripheral nerve sheaths. They are common, generally benign, truly encapsulated and developed from Schwann cells. They are mainly located in the cervical region and the lower extremities. Their occurrence in the inguinal region is rare, especially on the femoral nerve. We described here a rare case of a femoral nerve schwannoma misdiagnosed as an inguinal herniation in a 49 year-old man and we discuss the clinical findings and really the diagnosis dilemma encountered in such location.

Keywords: Schwannoma, Femoral nerve, MRI, Surgery

EP-0433 [Spine and Peripheral Nerve » Peripheral Nerve]

Histopathological Effects of Tissue Adhesives on Regeneration After Peripheral Nerve Transection: An Experimental Study

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Aim: To evaluate the histopathological impacts of gelatin based (GB) and polymeric hydrogel based (PHB) tissue adhesives on regeneration after peripheral nerve transection in an experimental model.

Method: Forty-eight female Wistar-Albino rats were allocated to 8 groups with respect to the procedure applied after transection of right sciatic nerves. Group I underwent external circumferential neurolysis; Group II underwent repair with 4 sutures; Group III received local PHB tissue adhesive; Group IV had repair with 2 sutures and local PHB based tissue adhesive; Group V had GB tissue adhesive and Group VI had repair with 2 sutures and GB tissue adhesive. After 6 weeks, biopsies were obtained from site of

neural injury and histopathological scores based on inflammatory, degenerative and fibrotic changes were compared between groups.

Results: Groups I and II had significantly lower scar tissue formation. Inflammatory cell count was notably lower in Groups I, II and III. Group IV displayed a higher inflammatory cell count compared to Group V. Perineural fibroblast count was lower in Groups I and II, while a number of axons were significantly higher in Group I. In Group V, the number of axons was higher in rats with severe perineural adhesion ($p=0.034$). In this group, scar tissue formation index was inversely correlated with inflammatory cell count ($p=0.039$).

Conclusion: We suggest that use of PHB and GB tissue adhesives for peripheral nerve injury is associated with noteworthy histopathological changes. Further trials are warranted to elucidate the impacts of tissue adhesives on healing and repair processes at the tissue level.

Keywords: Peripheral nerve, Injury, Duraseal, BioGlue, Repair, Tissue adhesive

EP-0434 [Spine and Peripheral Nerve » Degenerative Spine]

Spontaneous Regression of the Herniated Lumbar Disc: Clinical and Imaging Predictors

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The aim of this study is to assess the role of imaging to predict the possibility of spontaneous disc regression. The study will be conducted on 30 patients referred to the Alexandria main University Hospital presenting by lumbar disc herniation. All patients will be subjected to:

1. CT or MRI according to the condition.
2. Follow-up by the same imaging modality after conservative treatment.

The results obtained will be statistically analyzed and presented in tables and figures and the different parameters will be correlated with each other. The results will be discussed according to their significance and their comparison with other available works and information in the literature.

Keywords: Lumbar, Disc, Spontaneous, Resolution, Sciatica

EP-0435 [Spine and Peripheral Nerve » Degenerative Spine]

Our Experience of Surgical Treatment of Failed Back Surgery Syndrome with Osteochondrosis of the Lumbar Division

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Background: Determination of the optimal methods of surgical treatment of failed back surgery syndrome of the lumbar division after discectomy.

Method: The study included 36 patients operated on relapses of pain syndromes. Repeated surgical interventions were decompressive and decompressive-stabilizing with posterior interbody spondylosis

with cage and transpedicular systems. The results of the treatment of relapses were studied in the period from 6 to 48 months. Were evaluated the dynamics of neurological status, pain intensity on visual analogue scale.

Results: The main cause of recurrent pain syndromes were recurrent hernias of operated disk (52,8 %) and their combinations with degenerative stenosis (9,7 %). In isolated type the degenerative stenosis was the cause of relapse (21,6 %). Hernia relapses of operated disk more often were the cause of the pain syndrome in the first two years after surgery. Degenerative stenosis, both in isolated type and also in combination with the hernia of operated disk, often took place at a later dates. Pathomorphological substrate of stenosis were hypertrophied articular process, the pedicles of the vertebrae, osteophytes, thick, yellow ligament, epidural fibrosis. Fibrotic changes were identified intraoperatively in all cases. The treatment outcomes were better in patients who were performed decompressive-stabilizing operations. The repeated relapses of pain after performing decompressive operations occurred in 9,8% of cases, and after decompressive-stabilizing – in 1,4 %.

Conclusion: Decompressive-stabilizing operations with performing posterior interbody fusion are optimal and technically adequate form of surgical treatment of recurrent pain syndrome after removal of herniated lumbar intervertebral disks.

Keywords: Failed back surgery syndrome, Osteochondrosis, Lumbar division

EP-0436 [Spine and Peripheral Nerve » Degenerative Spine]

Extraordinary Complication After Lumbar Discectomy and CSF Leakage - Epileptic Seizure

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A 51 year old female patient was admitted to the ward with a complaint of left leg pain. She had an ongoing history of pain over 2 years which had worsened in the last 20 days while also causing weakness in her foot movement. Lumbar MRI was ordered which revealed an extrusion of the L5-S1 intervertebral disc on the left side. A classic midline incision at the level of L5-S1 in prone position followed by periosteal dissection and microlaminotomy was performed. When excising the calcified ligamentum flavum, CSF leakage was observed but no visible laceration of the dura mater was detected. The fragment which compressed her S1 root was visualized and removed. Fibrin tissue sealant was used. She was relieved of her symptoms postoperatively and was discharged after observing for CSF leakage for 2 days. She reappeared to our clinic in 2 weeks with resolved pain but difficulty in waking up in the morning and amnesia. She also complained of a collection in her incision field. Upon inspection of the fluid collection and palpation she had a generalized tonic-clonic seizure. A cranial MRI was ordered which revealed no pathology. An EEG was performed which revealed no seizure with classical stimulation methods but presented with seizure after palpation of the collection. She was reoperated on; her

laminotomy defect was widened to observe the leakage point. Dura mater was sutured. She was discharged a week later and upon her 1 year follow up no seizure was observed.

Keywords: Epilepsy, Seizure, Discectomy, CSF, Leak, Lumbar

EP-0437 [Spine and Peripheral Nerve » Degenerative Spine] Lumbar Spinal Stenosis and Normal Pressure Hydrocephalus

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Lumbar spinal stenosis is common in elderly population and patients present with difficulty ambulating due to leg pain, weakness or heaviness sensation. They often have gait difficulty and present with ambulating with the aid of a walker. These patients after having failed conservative therapy, undergo spinal decompressive surgery. They may improve with less pain or weakness in their legs, but some still cannot walk adequately due to gait difficulty. Careful analysis of the gait (which was abnormal preoperatively also) shows a wide based magnetic gait. Close questioning reveals associated symptoms of urinary incontinence and short term memory difficulty (often attributed to age). Brain CT/MRI shows dilated ventricles out of proportion to cortical Silvia. These patients have normal pressure hydrocephalus, and dramatically improve with a shunt. Careful preoperative evaluation re: gait, memory, and incontinence should be done for all patients with diagnosis of spinal stenosis with neurogenic claudication and gait difficulty as two concomitant diagnoses can exist, and one of them can be missed. Correct diagnosis and treatment for both conditions may then be needed and patients achieve a better outcome.

Keywords: Spinal stenosis, Normal pressure hydrocephalus, Gait

EP-0438 [Spine and Peripheral Nerve » Degenerative Spine] Cervical Spinal Canal Stenosis: A Rare Cause of Syringomyelia

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Syringomyelia is commonly associated with chiari malformations, spinal trauma, arachnoiditis or tumors. Cervical canal stenosis is rarely implicated in this intramedullary cavitation. We report the case of a 60 year-old man with disabling paresthesia and impaired pain in upper limbs. Physical examination revealed spastic tetraparesis and syringomyelic syndrome. X-ray of the cervical spine demonstrated stenosis of the cervical canal and degenerative changes from C3 to C6 levels. Magnetic resonance imaging showed also a syrinx located in the cervical and thoracic regions from C1 to T3. There were no contrast enhancement or cranio-vertebral junction abnormalities. After cervical laminectomy, symptoms improved and the syrinx has almost disappeared. Syringomyelic cavity may be developed due to craniospinal pressure dissociation caused by spinal cord compression. Laminectomy could be sufficient to induce regression of the syringomyelia.

Keywords: Syringomyelia, Cervical stenosis, MRI, Surgery

EP-0439 [Spine and Peripheral Nerve » Degenerative Spine] Tandem Spinal Stenosis: Experience at a Tertiary Care Center

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Aim: To study the frequency, natural history, outcome after surgical decompression in a patients having concurrent cervical and lumbar spinal stenosis.

Method: Patients with co existing cervical and lumbar degenerative disease who underwent surgical intervention from 2007 to 2012 were included in the study. Frequency, natural history, outcome after surgical decompression in a patients having concurrent cervical and lumbar spinal stenosis were studied for the above period. Nurick score and mJOA score were used for functional outcome.

Results: Among 954 cases degenerative disease, concurrent stenosis was identified in 63 cases (50 male-13 female) with a frequency of 6.6%. The mean age was 57 years \pm 11.47 year (range: 27-80years). Out of 63 patients of concurrent stenosis, 26 patients(41.2%) had signs and symptoms both cervical and lumbar stenosis and 20 patients (31.7%) had signs and symptoms of only cervical stenosis, 7 patients (11.1%) had signs and symptoms of only lumbar stenosis and 10 patients (16%) had radiological finding of combined stenosis present but clinically absent. Only cervical decompression either anterior or posterior was done in 44 patients (70%), only lumbar operation (laminectomy/discectomy) was done in 10 patients (16%). Both cervical and lumbar surgery was done in 9 patients (14%). The mean follow up was 12.3 month(1- 60 months).

Conclusion: Asymptomatic radiological concurrent cervical and lumbar stenosis can be seen in a large percentage of population compared to symptomatic patient that need surgical decompression. In concurrent symptomatic stenosis, cervical surgery obviated the need for lumbar surgery in many patients.

Keywords: Concurrent spinal stenosis, Tandem stenosis, Degenerative disc disease

EP-0440 [Spine and Peripheral Nerve » Degenerative Spine] What Differs Between Lower and Upper Lumbar Disc Herniation?

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Aim: To evaluate whether patients with upper level lumbar disc herniation were different from those with lower level lumbar disc herniation in terms of demographic, lumbo-pelvic alignment and Modic changes.

Method: Patients, who underwent single level lumbar microdiscectomy in 2 different hospitals between June 2013 and January 2017, were retrospectively evaluated using the electronic databases.

Results: There were 247 patients, of which 11.7% had upper lumbar level disc herniation. Results Of 247 patients included in the present study, 113 were female (45.7%). Mean age of the patients was 45,97 years (range= 17-89). Modic change was present in 50.2% patients. Compared to lower lumbar level disc herniation, patients with upper lumbar level disc herniation were significantly older (44,64 vs. 56,00, $p<0.001$), had significantly higher PI (47,31 vs. 52,00, $p=0.033$) and higher SS (33,60 vs. 37,82, $p=0.04$) values. There was lumbo-pelvic mismatch in the lower level disc herniation, despite the difference was non-significant compared to upper level (10,05 vs. 8,91, $p>0.05$). Patients in the both groups had similar LL and PT values. The trend of increasing age with upper level was more obvious when there was concomitant Modic change ($p<0.001$). Patients with Modic change had lower LL, higher PT, and lumbo-pelvic mismatch ($p>0.05$).

Conclusion: Increased PI and SS are associated more with upper level lumbar disc herniation, which is contrary to a previous study, which could be explained by genetic and geographical variations.

Keywords: Lumbar disc herniation, Upper, Lower, Modic Change, Lumbo-pelvic alignment

EP-0441 [Spine and Peripheral Nerve » Degenerative Spine] Neurological Deficits and Odds for Recovery

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Background: Neurological deficits—Most commonly L5 and S1 root – are very common in Neurosurgical practice. Many times though patients end up coming with delayed deficits far beyond the 48-72 hrs time frame. And thus the question arises: What are the odds for recovering from such a delayed deficit? When should they be operated on?

Method: We compare our control group(Gr A.) of 84 “timely” operated deficits (within the 48 hrs timeframe) with the group of 48 patients (Gr B.)who were operated for delayed deficits. The B group is further subdivided in Gr B1: 48-72hrs, Gr B2 72hrs to 4 days, Gr B3 5-7days, Gr B4 8 days -2wks, B5 2wks-2months and B6 >2 months.

Results: The patients with the delayed deficit fared - as expected - with varying degrees of success, proportional to the time of operation. B1: 92%, B2: 72%, B3: 60%, B4:51%, B5: 35%, B6:22%. On the other hand the Group A patients fared with an almost perfect 98,8%.

Conclusion: There is a small chance for Non recovery between 48 and 72hrs although this might be technical. No patient should be excluded from the operative candidate list even if he appears with a significantly delayed deficit > 2months, because he does stand a chance to a normal life. Nonetheless the patients should be informed that odds for recovery for more than a week-old deficit barely surpass 50%. Best time for operation for B1-3 Groups is on next safe day basis.

Keywords: Deficit, Operative timeframe, Odds recovery

EP-0442 [Spine and Peripheral Nerve » Degenerative Spine] Surgical Management of Cervical Spondylotic Myelopathy

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Aim: To define efficiency of application methods exact differentiated surgical decompression for cervical spondylotic myelopathy.

Method: Research based on the clinical outcome; results of neuroimaging and neurophysiologic investigation of 915 patients with cervical spondylotic myelopathy surgically treated. Direction of surgical decompression and parameters of instrumentation planned according to vector of compression, depending on character and extension of compression. All circular stenosis myelopathic patients subdivided in the groups according to spine deformity (kyphosis, hyperlordosis, normal curvature). The preoperative electrophysiological investigation (transcranial magnetic stimulation – TMS; somato-sensor evoked potentials – SSEP; etc.) to localize primary compressive force analyzed. According to spine deformities, direction of primary cord compression, electrophysiological data - differentiated surgical decompression (anterior approaches with instrumentation – 425; anterior multilevel discectomy – 142; laminoplasty – 174; laminectomy with instrumentation 91; combined approach – 83) performed.

Results: We founded significant increasing Recovery Rate - 56% (JOA score) and Nurick restoration – 2-4 ($3,43 \pm 0.327$) as follow up after differentiated surgical decompression (with electrophysiological investigation and algorithm controlling) in comparison with previous clinical outcome (165 cases) patients without differentiated surgical decision (Recovery Rate – 44%; Nurick – $2,75 \pm 0,459$; $P<0,001$).

Conclusion: For the first time, on the big clinical material the advantages algorithm of the choice a surgical method adequate decompression for the compressive spondylotic myelopathy was demonstrated. The modern approach in surgery of degenerative cervical spine demands unification of terminology, standardization of surgical approaches and scales

Keywords: Cervical myelopathy, Spine decompression, Laminoplasthy

EP-0443 [Spine and Peripheral Nerve » Degenerative Spine] Functional Outcomes of Surgical Treatment for Cervical Myelopathy in Adults with Cerebral Palsy

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Background: In adults with cerebral palsy (CP), cervical spondylotic myelopathy can aggravate neurological state, which needs surgical treatment. This study investigated the functional changes after operative management of cervical myelopathy in the CP patients.

Method: All medical records for CP patients with cervical

myelopathy have been retrospectively reviewed. Among total 160 patients, seventy-five CP patients underwent surgery. Eighty-five CP patients with cervical myelopathy were not treated with surgery. Modified Barthel index (MBI), neck disability index (NDI), hand function test, numeric rating scale (NRS) for pain and strength, and satisfaction for surgery were evaluated.

Results: In the muscle strength of shoulder, elbow and hand, the number of patients (%) who improved by more than one motor level in MMT significantly increased after surgery (19%, 14% and 11% in surgical group, 8%, 4% and 0% in non-surgical group; $p < 0.05$ respectively). In surgical patients, MBI increased, NDI decreased, and hand functions improved after surgery, whereas MBI decreased and NDI increased in non-surgical patients. Particularly, CP patients underwent surgical treatment for motor weakness accompanied by pain increased functions and decreased disability. NRS for pain and strength was improved in patients with less than 5 years compared to the group with more than 5 years after surgery.

Conclusion: Surgical treatment for cervical myelopathy in CP patients might be one of therapeutic options, which can be beneficial to increase MBI and decrease NDI. However, it takes precaution that functional outcomes can be alleviated more than 5 years after surgical treatment.

Keywords: Cerebral palsy, Cervical myelopathy, Surgical treatment, Functional outcomes

EP-0444 [Spine and Peripheral Nerve » Degenerative Spine]

Motion Preservation Surgery: Anterior Cervical Micro-Foraminotomy - A Technical Note

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Cervical spine is the most mobile part of the spine. It is a great concern of the spine surgeons to preserve the motion of the segment in the same time dealing the pathology, whenever possible. Elimination of the motion of a cervical segment is likely causes extra load on the adjacent segments and hence early degeneration. To address this problem various surgical techniques and artificial cervical disc have been proposed. Anterior cervical trans-corporeal micro-foraminotomy is one of the surgical techniques where the natural disc is preserved at the same time only the herniated portion of the disc is removed. Here I will discuss a surgical technique of managing the pathology with anatomical preservation of the functioning intervertebral disc.

Keywords: Motion preservation, Lateral disc prolapse, Anterior micro-foraminotomy

EP-0445 [Spine and Peripheral Nerve » Degenerative Spine]

Surgical Treatment of Degenerative Cervical Spine Stenosis

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Our work represents variants of the clinical course of degenerative cervical spine stenosis. We have introduced differential approach to the surgical treatment of this pathology in our practice. We have

analyzed the results of surgical treatment of 76 patients during the 4 years period. All the patients were at the age between 34 - 69 years old (men - 56, women - 20). All the patients have undergone MRI or CT, together with functional investigation. Clinical signs of cervical spine stenosis presented predominantly with compression-ischemic myelopathy in 66 (86, 8%) patients. It includes movement and sensitive disturbances together with pelvic functions disorder. Cervical myelopathy proceeded at the form of LAS syndrome in 8 (10, 5%) patients with multilevel stenosis. Root signs were dominant at the rest of the patients 10 (13, 2%). Appropriate selection of the surgical strategy gave the chance to achieve good response at the postoperative period in 78,9 % of patients.

Keywords: Cervical myelopathy, Surgical strategy, Spine stenosis

EP-0446 [Spine and Peripheral Nerve » Degenerative Spine]

Epidemiological Characterization of the Cases of Pathological Fractures in a Tertiary Hospital

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Background: Pathological fractures, are increasingly frequent in outpatient and emergency medicine. The epidemiological characterization of such an event becomes indispensable due to its severity, especially when there is involvement of the vertebral column, being able to attend with severe spinal injuries. Our aim is to determine the epidemiology of spinal's pathological fractures in a tertiary hospital.

Method: Retrospective and descriptive study with a quantitative approach of 21 medical records of hospitalized patients for spine fracture between January 2013 and December 2015. Data were collected from a standard form and organized in Microsoft Excel 2010 spreadsheet.

Results: Females represented 80.95% of the sample ($n = 17$). The prevalent age group was over 46 years, 90.47%, nine patients between 46 and 60 and ten over 60; Followed by the age group 21-45 years old with 9.52% ($n = 2$). All cases were classified as category A of AoSpine and complained of pain in the affected segment. According to the Asia classification, 9.52% ($n = 2$) of the patients were classified as A; 4.76% C ($n = 1$); Among the underlying pathologies, osteoporosis was the most prevalent (42.85%), followed by systemic lupus erythematosus (19%), 04%, rheumatoid arthritis (14.28%), multiple myeloma (9.52%), systemic sclerosis, Crohn's disease and vasculitis, 4.76% each. Eighteen patients (85.71%) were treated surgically and only three (14.28%) clinically.

Conclusion: Spinal fractures were more prevalent in women and the majority of patients were more than 45 years old. Although it is a serious complication, the majority have evolved without residual neurological deficit.

Keywords: Pathological fractures, Epidemiology, Spine

EP-0447 [Spine and Peripheral Nerve » Degenerative Spine] Coblation-Assisted Percutaneous Disc Decompression for Contained Lumbar Disc Protrusions. 15 Year Results of 400 Patients

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Background: Percutaneous disc decompression (PDD) was introduced as a minimally invasive alternative for treating symptomatic contained disc protrusion when fusion or open micro-discectomy may not be beneficial. In the literature only in rare cases randomized, placebo controlled studies are available. In Evaluation the studies the inhomogeneous structure of the patient cohorts and the also inhomogeneous indication (axial / vs. radicular pain syndromes) are impressive. The purpose of our study was to retrospectively evaluate pain resolution and function scores through two years following PDD by the nucleoplasty procedure.

Method: Retrospective case-series with 400 patients with chronic radicular pain and contained disc protrusion in MRI. Provocative discography was performed. Patients underwent PDD using coblation. Clinical outcomes measures (VAS, medication, Oswestry and Macnab) were collected pre-operatively and from 2 months to 15 years frequently.

Results: Preoperatively, all patients reported leg and back pain VAS > 6. The Oswestry scores were measured. Significant improvement in VAS, Oswestry and Macnab scoring.

Conclusion: Percutaneous disc decompression using a plasma-mediated radiofrequency-based device is a safe and minimally invasive procedure for patients with painful contained disc protrusion. PDD offers an exceptional treatment alternative since it provides excellent outcomes when strong indication is respected. From 2-10 years decreasing results and increasing numbers of revisions were observed.

Keywords: Percutaneous disc decompression, Radicular pain, LDD

EP-0448 [Spine and Peripheral Nerve » Degenerative Spine] Lumbar Degenerative Spondylolisthesis: A 5-Year, Single-Center Experience

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Background: Lumbar degenerative spondylolisthesis (LDS) is an acquired slippage of one lumbar vertebra on the lower one as the result of degenerative instability, in the absence of a defect in the pars interarticularis.

Method: This retrospective study was carried out on 42 patients with LDS operated in the department of neurosurgery of Fattouma Bourguiba University Hospital, Monastir, Tunisia from August 2010 to August 2015. The patients' pain and disability were assessed by visual analogue scale (VAS), all intra- postoperative complications were recorded. All the patients had neural decompression, pedicular screw fixation, and posterolateral fusion.

Results: Female patients represented 76% of our study population (32). The mean age at presentation was 53 years. 90% of our patients had a BMI > 25. Lumbar pain was noticed in all cases, followed

by lumbar sciatalgia (76%). 61% of our patients had Grade II spondylolisthesis and 19% type I. L4-L5 level was involved in 57% of cases, followed by L3-L4 (20) and L5-S1 (23%). Spondylolisthesis was associated to lumbar spinal canal stenosis in 52% of the cases (22). All patients were treated by neural decompression, pedicular screw fixation, and posterolateral fusion. Lumbar interbody cages with bone graft were inserted in 71% of cases. The mean slip correction rate was 72.2%. Clinical improvement was more prominent in more reduced patients without reaching statistical significance.

Conclusion: Lumbar decompression and fusion is the mainstay of the treatment of LDS and is usually associated with a good surgical outcome especially in reduced patients.

Keywords: Lumbar, Spine, Degenerative, Spondylolisthesis, Surgery

EP-0449 [Spine and Peripheral Nerve » Degenerative Spine] Use of Intraoperative Epidural Methylprednisolone in Lumbar Minimal Invasive Discectomy: A Randomized Study with Two-Year Follow-Up

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Background: Postoperative back and radicular pain is common symptoms after discectomy. The cause is multifactorial which include persistent inflammation of soft tissue, traumatic injury during surgery. This delay hospital discharge and resumption of normal activity. Controversies still exist regarding the benefits of these drugs. The aim of this study is to evaluate the outcome, neurologic impairment and safety of epidural steroids following lumbar MID. We randomized 324 patients after lumbar minimal invasive discectomy (MID) which received epidural methylprednisolone before closing the wound or none. Here we report a 2-year follow-up of a randomized trial of epidural steroid following lumbar discectomy.

Method: A total of 324 patients undergoing MID were allocated to receive epidural methylprednisolone or none. The period of randomization was 2013-2015 and all surgeries was performed by the same neurosurgical team. Control group (87 males and 73 females) 62-L5, 74-L4, 24-L3 discectomies were performed. Methylprednisolone group (97 males and 67 females) 67-L5, 81-L4, and 16-L3 discectomies. All patients received preoperative antibiotics and the same multimodal pain treatment. Postoperative back and radicular pain intensity was assessed by a visual analogue scale before and at 24,48,72 and 96 hours after surgery.

Results: Hospital stay was reduced from 4 to 3 days and the number of patients with neurologic signs were reduced more (69%vs45%). Incidence of reoperation at 2 years was 8% in the control group and 7% in the intervention group. No infections were registered.

Conclusion: Application of epidural methylprednisolone makes the recovery after MID faster and with less pain without apparent side effects.

Keywords: Minimal invasive surgery, Discectomy, Steroids, Methylprednisolone

EP-0450 [Spine and Peripheral Nerve » Degenerative Spine] A Female Patient with Leriche Syndrome Who Presented with the Symptoms of Lumbar Spinal Stenosis: A Case Report

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Lumbar spinal stenosis is a very common disease especially in the elderly population. Patients present with the complaints of waist and leg pain and neurogenic claudication. A 69-year-old female patient was admitted to outpatient clinic with complaints of waist and leg pain, urinary incontinence, and neurogenic claudication. Lumbar spinal stenosis was detected at the L4-5 level in lumbar spinal magnetic resonance imaging (MRI) and bilateral L5 radiculopathy was detected in lower extremity EMG examination. The patient underwent decompression and posterior segmental instrumentation at the L3-5 level. There was paraparesis (grade 3/5) in bilateral lower extremities. On the first postoperative day, the patient had the complaints of cold sweating, pain in lower extremities. Bilateral pulses were not obtained and no flow was detected in doppler ultrasonography of the lower extremity arteries. In abdominal MR angiographic examination; total stenosis was detected in the abdominal aorta from below the renal arteries. The patient underwent urgent operation by the cardiovascular surgery, bilateral aortofemoral bypass was performed. The patient had blood clots that caused thrombosis in the occluded aortic region. The patient's lower extremity pulses began to be taken after bilateral aortofemoral bypass. Leriche syndrome is acute stenosis of the subrenal abdominal aorta. The symptoms of Leriche syndrome include intermittent and bilateral claudication, absent or diminished femoral pulses, and ischemic pain and weakness in the lower extremities. It has similar complaints with lumbar spinal stenosis therefore the differential diagnosis should be done well.

Keywords: Leriche syndrome, Lumbar spinal stenosis, Neurogenic claudication

EP-0451 [Spine and Peripheral Nerve » Degenerative Spine] Complication Avoidance in Acom Aneurysm Surgery; An Early Experience of 16 Cases

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Background: A lot of controversies are there in treating Acom aneurysm surgery. Proximal control, timing of surgery, Sylvian fissure dissection, approach and patient selection are few of those. Avoiding the major catastrophe like perforator injury is mandatory, proximal control of both A1 in intraoperative rupture is life worthy. The technique of arachnoid dissection to avoid injury to AcoA complex and brain retraction makes the surgery easier. Complication avoidance of 16 cases were discussed in this series.

Method: A retrospective study of 16 cases were observed of whom 9 were male and 7 were female. Avoidance of complications in Acom aneurysm surgery was studied.

Results: Out of 16 patients-2 patient died, 1 developed 3rd nerve

palsy which was recovered after 3 months, 1 had aneurysm rest, 1 developed hydrocephalus.

Conclusion: The complexity of location necessitates the avoidance of complications in Acom Aneurysm surgery. The learning curve to avoid such complications is a step forward. Collection of larger series will further contribute to the society.

Keywords: Acom, Aneurysm, Complication

EP-0452 [Spine and Peripheral Nerve » Degenerative Spine] Dynamic Stabilization of the Lumbar Spine: Analysis of a Series of 101 Patients Treated at São Paulo Military Area Hospital, Brazil

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Dynamic stabilization is an important spine surgery technique for young patients. There are, however, scarce literature reports about the performance of patients undergoing this type of surgery under extreme physical and biomechanical demands. Retrospective data of all patients who underwent operation by this technique at this hospital. Characteristics as age, gender, etiology, number of levels treated, pain improvement, complications, time to return to unrestricted military activities were raised. Pain was measured using the Visual Pain Scale and Oswestry Disability Index in pre and postoperative periods. Age ranged from 19 to 56 years, 60% male. The majority of the patients had lumbago due to 1 level lumbar disc herniation. We had only 8% of complications due to infection. Regarding the response to treatment, the parameters evaluated indicated clinical improvement. Dynamic stabilization might be an excellent option to treat lumbar spine disease in patients with high biomechanical demands (athletes, military personnel). Surgical indication for lumbar spine disease must consider the occupational activity. Preservation of mobility and rapid return to activities make this technique an effective method for them.

Keywords: Dynamic stabilization, Lumbar spine, Brazilian army, Military

EP-0453 [Spine and Peripheral Nerve » Degenerative Spine] Thoracic Myelopathy Caused by Ossification of the Ligamentum Flavum: A Report of 33 Cases

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Background: Thoracic myelopathy caused by Ossification of the ligamentum flavum (OLF) is a rare entity, most evident in East Asia. The authors studied the clinical manifestations, radiological aspects, surgical treatment, and pathogenesis of this disease in a North African series.

Method: Data obtained in 33 patients who underwent laminectomy

for thoracic myelopathy caused by OLF were studied retrospectively. **Results:** There were 26 men and 7 women who ranged in age from 38 to 76 years. The severity of myelopathy varied. Paraplegia was seen in 7 cases. Compression of the upper and middle third of the thoracic spine was evident in 9 cases and of the lower third in 24 cases. Multilevel OLF was demonstrated in 23 cases. In most cases, the OLF appears as a V-shaped lesion on axial images. Laminectomy was limited to the levels of compression, and the ligamentum flavum was drilled in all cases. The symptoms and signs improved in 23 cases and stabilized in 8 cases. In 2 cases symptoms recurred as a result of ossified lesions forming at other sites. No patients experienced kyphotic deformity. Histological examination showed that the mode of development of the ossified ligaments was endochondral ossification.

Conclusion: The incidence of OLF seems to be relatively high in North Africa. An early laminectomy limited to the level of compression with careful drilling of the OLF is recommended. Patients with a shorter preoperative duration of symptoms and milder myelopathy experienced better neurological outcome.

Keywords: Ligamentum flavum, Ossification, Myelopathy, Surgery, Outcome

EP-0454 [Spine and Peripheral Nerve » Degenerative Spine] Contribution of Circumferential Arthrodesis in Spondylolisthesis Surgery: Prospective Study of 70 Cases

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Background: Spondylolisthesis is defined by the displacement of vertebra regarding the underlying vertebrae. It consists in an abnormality encountered frequently (4 to 6% of the general population for the Spondylolisthesis isthmic lysis. There are different kinds of Spondylolisthesis but the most frequent are those of isthmic and degenerative type. Multiple surgical techniques have been described for Spondylolisthesis treatment.

Method: We have realized a prospective study on 62 patients operated through median posterior approach with systematic realization of GILL type posterior decompression.

Results: The average age of our patient was 44.67 years with extremes from 22 to 64 years. The patients were spread into 22 men and 40 women with a sex ratio of 1M/4W. An instrumented postero-lateral arthrodesis (PLA) have been practiced on 20 patients (1st group). The remaining 42 patients had, in addition to this technique, an associated interbody arthrodesis (PLA + IBA) (2nd group). Our goal is to seek the interbody arthrodesis contribution to the post-operative results of patients operated through posterior approach of isthmic or degenerative lumbar Spondylolisthesis. The average series decline during the review is 13.86 months with extremes from 6 to 30 months. We had 42 cases of isthmic spondylolisthesis and 20 cases of degenerative spondylolisthesis.

Conclusion: Spondylolisthesis remain often asymptomatic, 10 to 20 % of the diagnosed Spondylolisthesis are operated. Taking care of these pathologies is subject to no consensus

Keywords: Spondylolisthesis, Contribution of circumferential arthrodesis, Isthmic Spondylolisthesis, Degenerative spondylolisthesis

EP-0455 [Spine and Peripheral Nerve » Degenerative Spine] Vertebral Artery Loops in Surgical Perspective

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Background: Vertebral artery loop is a congenital or acquired anomaly. Vertebral artery loops are incidentally diagnosed during evaluation of neck problems and trauma. We aimed to present the incidence of VA loops using magnetic resonance angiography in consecutive patients and discuss epidemiological data including the gender, age, location, signs and symptoms, treatment approaches and outcomes of VA loops via analyzing literature.

Method: In the first leg of our two-legged study, consecutive patients were evaluated using magnetic resonance angiography to detect any medial loop of vertebral arteries. In the second leg, academic databases about medial loop of vertebral artery were screened. Case reports, case series, abstracts and references of relevant literature were searched.

Results: We evaluated 239 consecutive patients. Medial loop of V2 vertebral artery was observed in 13 patients (5.9 %). Patients with medial V2 loop were significantly older than patients with straight vertebral arteries (70.30 vs. 62.36, p = 0.028). In the literature analysis, VA loops were more commonly observed at V2 segment (90.5 %). Vertebral artery loops were mostly diagnosed at the 5th and 6th decades of life predominantly in females. The most common signs and symptoms were radiculopathy and/or neck pain, and signs and symptoms of vertebrobasilar insufficiency.

Conclusion: Concise pre-operative evaluation of the vertebral arteries is essential to avoid the injury of undiagnosed VA loops during surgery, which might result in catastrophic circumstances. Further evaluation of the vertebral arteries using MR angiography is required, especially in elder age, before cervical spine surgeries.

Keywords: Vertebral artery loop, Tortuous anomaly, Radiculopathy, Neck pain

EP-0456 [Spine and Peripheral Nerve » Degenerative Spine] Unilateral Vision Loss without Ophthalmoplegia as a Rare Complication of Spinal Surgery: Case Report

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Postoperative visual loss is an extremely rare complication of non-ocular surgery. The most common causes are ischemic optic neuropathy, central retinal artery occlusion, cerebral ischemia. The most important risk factors are long-lasting operations, massive bleedings, fluid overload, hypotension, hypothermia, coagulation disorders, direct trauma, embolism, long-term

external ocular pressure and anemia. Here; we present a 54-year-old male patient who developed acute visual loss in his left eye after a lumbar instrumentation surgery and was diagnosed with retinal artery occlusion. He presented to our outpatient clinic with a 3-week history of low back pain radiating down to his right leg. Neurogenic claudication and lumbar radiculopathy were detected in his neurological examination. Grade 1 spondylolisthesis, multiple discopathies and lumbar spinal stenosis were detected on his lumbar Magnetic Resonance Imaging (MRI) scan. The patient underwent a two-level lumbar micro-discectomy, 4-level decompression, and 4-level transpedicular screw fixation surgery. Immediately after the surgery, the patient complained of having no vision in his left eye. In ophthalmologic examination, visual acuity was 20/20 in the right eye and he had no vision and no light perception in the left eye. In the fundoscopic examination, the right retina was normal and the left retina was completely pale. Anterior chamber paracentesis was performed at the 20th hour of the surgery. The patient was discharged with a loss of vision in the left eye on the 5th day of operation. Although postoperative visual loss is a rare complication of non-ocular surgery, it might be irreversible which would be a dramatic consequence.

Keywords: Lumbar instrumentation, Retinal artery embolism, Retinal artery occlusion, Postoperative visual loss, Non-ocular surgery

EP-0457 [Spine and Peripheral Nerve » Degenerative Spine] Transpedicular Screw in Degenerative Lumbosacral Spine Disease - Surgical Outcome

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Background: Prospective evaluation of the outcome of pedicle screws in the treatment of degenerative lumbar spine disease in fifty five patients who were treated consecutively via a posterior surgical approach with pedicle screw fixation.

Method: 55 patients were admitted to the hospital with a chronic back pain and/or radicular pain, had a pedicle anatomy (based on a preoperative X-ray) that could accommodate surgical stabilization with PS instrumentation and fusion. Posterior surgical stabilization of the degenerative lumbar spine disease with pedicular screws was done and before discharge, each patient underwent postoperative X-ray of lumbosacral spine.

Results: In this series, 55 patients were operated on for pedicular screw fixation with connecting bar. All patients' pain disappeared or became less, also paresthesia. 10 patients with lower limb neurological deficit improved. Only 5 of all patients were re-operated (three due to displacement, one due to broken screw, one due to loose screw), 3 patients developed dural tears were treated by suturing with muscle patch. No vascular injury, no post-operative infection seen but one patient developed DVT post-operatively treated conservatively.

Conclusion: Pedicle screw fixation facilitates the bone-fusion process, and its use is associated with a relatively low complication rate. The application of pedicle screws can be technically demanding; a thorough working knowledge of spinal anatomy and. These devices should be used when there is any feature of instability or due to iatrogenic instability after wide bone removing or after destruction of facet joints.

Keywords: Pedicle, Screw, Degenerative lumbosacral spine

EP-0458 [Spine and Peripheral Nerve » Degenerative Spine] Lumbar Spinal Stenosis: Surgical Outcome of 150 Patients Series

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Background: Lumbar Spinal Stenosis (LSS) can be defined as the abnormality ratio between the spine (bones, joints, ligaments) and nerve, vascular structures and spinal fluid. The term lumbar spinal stenosis is inappropriate because it evokes rather an anomaly of one container. The etiology is acquired or secondary. The symptoms are caused by this evolutive conflict between all the constituents of the spine. Surgery remains the treatment in order to free nervous structures.

Method: We conducted a retrospective review of 150 patients. 108 males and 42 females with mean age of 44 years old. At the admission the main clinical presentations are lumbago, radiculalgia and intermittent medullary claudication. Spine CT scan objectified the stenosis. The MRI and CT - Myelography confirm the stenosis and evaluate the nervous structures. We operated all the 150 patients through different techniques.

Results: At one month we noticed improvement of back pain and radicular pain at the effort for all the patients. Neurogenic claudication, motor deficit and sphincter disorders improve at 6 months after surgery. We noticed 1 case of instability and 3 cases of disc herniation.

Conclusion: The results of different surgical treatments are considered as good. The choice of surgical procedure and the decision to fuse should be individualized to optimize the outcome. Surgery referred to functional taking into account the clinical and radiological state.

Keywords: Lumbar stenosis, Neurogenic claudication, Radiculalgia

EP-0459 [Spine and Peripheral Nerve » Degenerative Spine] Diffuse Axonal Injury - An Underestimated Factor for Coma Patients with Unpredictable Outcomes

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Background: There is a minority of patients with a clinical image disproportionately severe to their CT findings who have trouble waking in the ICU. A large proportion of these patients suffers Diffuse axonal injury.

Method: We have evaluated our series of 217 comatose trauma patients who ended up in the ICU during the last 10 years. Of these patients 14 (6.4%) either did not have significant CT findings, nonetheless were comatose and required ICU treatment, or had (usually) contusions and small hematomas with variably disproportionately severe clinical images.

Results: MRI scans in 12/14 demonstrated Grade 1 (1) Grade 2 (9) and Grade 3(2) DAI. The outcome for the 2 undiagnosed, the 1/1 Grade 1 and 3/9 Grade 2 patients was favorable (GOS 4-5) within 2 months of the incident, despite the long term ICU admittance, while for the remaining 8 patients 50% had a favorable outcome at the 6 months time frame and 50% never exceeded GOS 3. One Grade 3 and 1 grade 2 patients were deceased.

Conclusion: DAI is rare, but must always be considered for “inexplicable” trauma patients. Grade 1 patients have high probabilities of recovery, while grade 2 and 3 patients are totally unpredictable, but still have a fairly good chance of successful recovery even more than 6 months after the incident.

Keywords: DAI, Diffuse axonal injury, Coma

EP-0460 [Spine and Peripheral Nerve » Degenerative Spine] Cyst of the Ligamentum Flavum -Report of Two Cases-

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Nowadays, cyst of ligamentum flavum is not uncommon and known as cause of radiculopathy. They are quite similar with other intraspinal synovial cysts or ganglion cysts, so-called “juxtafacet” cysts, but the recent improvement of neuroimaging techniques results in the ready identification of cysts of the ligamentum flavum and allows to differentiate with other intraspinal, extradural cyst. Several reports about the cyst of ligamentum flavum have been previously published, however, the exact etiology and pathogenesis have not been fully elucidated to date. We would like to report two cases of cyst of the ligamentum flavum and discuss the pathogenesis of the cyst formation with review of literatures.

Keywords: Juxtafacet cyst, Cyst of the ligamentum flavum, Pathogenesis

EP-0461 [Spine and Peripheral Nerve » Degenerative Spine] Multilevel Percutaneous Vertebroplasty (More than Three Levels) in the Management of Osteoporotic Fractures

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Background: Percutaneous vertebroplasty is a minimally invasive procedure designed to treat various spinal pathologies. The maximum number of levels to be injected at one setting is still debatable. This study was done to evaluate the usefulness and safety of multilevel percutaneous vertebroplasty (more than three vertebrae) in management of osteoporotic fractures.

Method: This prospective study was carried out on consecutive 20 patients with osteoporotic fractures who had been operated for multilevel percutaneous vertebroplasty (more than three levels). This study was done in Alexandria Main University hospital over a period of five years starting from June 2010 to June 2015. Ninety seven vertebrae were injected in those twenty patients (4 levels in eight patients, 5 levels in 7 patients and six levels in five patients). All patients were evaluated immediately post vertebroplasty and then every six months. Visual analogue scale (VAS) was used for pain intensity measurement and plain X-ray films and CT scan were used for radiological assessment. The mean follow-up period was 21.7 months (range, 12–40 months) including both clinical and radiological examinations.

Results: No cases with symptomatic bone cement leakage were recorded in the present study. Symptomatic pulmonary embolism was observed in one patient. Significant improvement of pain was recorded immediately postoperative in eighteen patients (90%).

Conclusion: multilevel percutaneous vertebroplasty for the treatment of osteoporotic fractures is a safe and successful procedure that can significantly reduce pain and improve patient's condition without a significant morbidity. I

Keywords: Percutaneous vertebroplasty, Osteoporotic fractures, Bone cement, Multilevel injection

EP-0462 [Spine and Peripheral Nerve » Degenerative Spine] Our Experience of the Facet Joints Radiofrequency Ablation

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Background: Pain syndromes observed in all patients with degenerative spine lesions. One of the main reasons for that is spondylarthritis, which leads to long-term irritation of facet nerve receptors. The aim of the study was to examine the results of radiofrequency ablation of facet nerves to eliminate back pain and reflex pain vertebral syndromes.

Method: We studied the results of radiofrequency ablation (RFA) in 22 patients with degenerative processes of intervertebral discs and spondylarthritis. All patients underwent a complete clinical and radiological examination including: laboratory tests, MSCT and MRI, EMG. The main indication for RFA was positive ($\geq 50\%$) test blockade of facet joints (3-4 joints in 2 sides).

Results: RFA performed 7 patients with cervical, thoracic 1 patient and 14 patients in the lumbar spine. RFA was performed in the operating room under fluoroscopic guidance with “C” arm. Short-term results were studied on the basis of clinical data - on a scale Nurick (NS). The results after RFA in cervical level: 6 patients obtained a significant regression of pain in the neck and areas of reflected pain syndromes (I level), 1 patient achieved II level (for NS). 12 (I level at NS) of the 14 patients after RFA at the lumbar level, got good results in the form of regression local pain in the back and areas reflected pain syndromes. 2 patients obtained level II (for NS).

Conclusion: These encouraging RFA results showed the possibility of using this method in the treatment of patients with degenerative diseases of intervertebral disks and to spondyloarthritis.

Keywords: Back pain, minimally invasive, RFA, Nurick scale

EP-0463 [Spine and Peripheral Nerve » Degenerative Spine] Lower Lumbar Disc Herniation with Contralateral Radicular Syndrome Associated with Motor Deficit

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Background: Herniated disc, also known as intervertebral disc rupture, is a condition in which part of the disk presses anatomical elements of the spinal canal (nerve roots and spinal cord). Age and injuries are several factors that predispose to the occurrence of lumbar disc herniation. The most common disc hernias are

common in the lower lumbar spine at the L4 and L5 discs. The aim and Backgrounds: Is to determine the indications and surgical treatment tactics.

Method: Study was performed on a sample of 7 patients with lower lumbar disc herniation with contralateral radicular syndrome, a total of 753 patients.

Results: Of the total number of patients 3 were women and 4 men. Patients were hospitalized, examined and treated in Republican Hospital during the years 2014-2016. The preoperative neurological examination after a nearly equal split between laterality: Right 4 cases, left 3 cases. Motor deficit found in 2 cases, one case ipsilateral to disc herniated and 1 case contralateral. The indications for surgery were determined by clinical signs, which suggested an acute disco radicular conflict. In our study, we wanted to re-instate discussions of herniated disc with contralateral radicular syndrome in association with motor deficit, what treatment and tactics to deal with. The patients with low lumbar disc herniation and radicular syndrome associated with contralateral motor deficit are rare.

Conclusion: This represents the first reported case in the literature of lower lumbar disc herniation with contralateral radicular syndrome associated with motor deficit.

Keywords: Disc herniation, Contralateral symptoms, Lumbar pain, Leg weakness, Motor deficit

EP-0464 [Spine and Peripheral Nerve » Degenerative Spine] Postoperative Discitis Identification and Management

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In our investigation we have presented the overview of our results in diagnostic and treatment options of postoperative discitis at 32 patients (men -22, women – 10) for the 10 years period. The age of patients varied from 18 till 62 years. All patients have undergone lumbar discectomy due to degenerative spine disease. In 26 cases disc herniation was removed via interlaminar approach and in 6 cases through percutaneous nucleotomy. Discitis has begun in 1-3 weeks after operation at all patients. Chief complain, at all patients, are shooting back pain amplifying and irradiating in buttocks and feet at slight spine movements. Intensity of pain varies. 19 (59,4%) patients had sub febrile temperature, 3 (9,4 %) patients - high temperature. Strong sudden pain attacks were observed at 24 (75 %) patients. Pain amplified basically in the evening and irradiated in buttocks, feet, perineum. 8 (25 %) cases had pain irradiation to the sacrum and testicle. Spasm of paravertebral muscles was identified in all cases. ESR high level was characteristic change in blood. MRI is the basic method of diagnostic discitis in our research. MRI allowed us to reveal the presence of postoperative discitis at the early stages of the disease. Discitis treatment includes antibacterial therapy during 4-6 weeks depending on severity of disease. Lumbar spine immobilization is for 8 weeks. Also patients need relaxants, anti-inflammatory drugs.

Keywords: Postoperative discitis, Diagnostic, Management

EP-0465 [Spine and Peripheral Nerve » Degenerative Spine] Tandem Spinal Stenosis: Outcome of Surgically Treated Patients

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Aim: To study the frequency, natural history, outcome after surgical decompression in patients having concurrent cervical and lumbar spinal stenosis.

Method: Patients with co-existing cervical and lumbar degenerative disease who underwent surgical intervention from 2007 to 2012 were included. Frequency, natural history & outcomes after surgical decompression were studied. Nurick score and mJOA score were used for functional outcome.

Results: Among 954 cases of cervical and/or lumbar degenerative disease, concurrent stenosis was identified in 63 cases (50 male, 13 female). The mean age was 57 years \pm 11.47 year (range: 27-80 years). 26 patients (41.2%) had signs and symptoms of both cervical and lumbar stenosis while 20 patients(31.7%), 7 patients (11.1%) and 10 patients (16%) had signs and symptoms of only cervical, only lumbar stenosis and clinically silent respectively. Only cervical decompression was done in 44 patients (70%), only lumbar operation in 10(16%) and both in 9 patients(14%). A single stage cervical and lumbar decompression was done in 5 patients (7.8%), while staged cervical followed by lumbar decompression in 4 (6.2%). The mean follow up was 12.3 months (range 1- 60). Excellent outcome (\geq 60% improvement) was observed in 18 patients (29%), good outcome (20-59% improvement) in 31 patients (49%) and partial improvement (5-20% improvement) in 7(11%).

Conclusion: In concurrent stenosis after cervical decompression, there was improvement in weakness, spasticity and other symptoms of myelopathy in lower limbs, obviating need for lumbar operation in some patients. Patients who needed only lumbar operation had best outcome. The functional outcome was not adversely affected by single stage versus two stage operation.

Keywords: Tandem stenosis, Cervical decompression, Lumbar laminectomy, Spinal stenosis

EP-0466 [Spine and Peripheral Nerve » Degenerative Spine] Cervical Disc Arthroplasty – Our Initial Experience

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Since the introduction of artificial disc nearly two decades increasing number of patients are managed with arthroplasty. We present our initial experience and short term results of Cervical Disc Arthroplasty. Our indications and technique are discussed in detail. Patients operated on by the presenting author between 2009 and 2016 have been included in the study and their outcome analysed retrospectively using validated patient reported outcome measures. The short term results are reported. These have been quite encouraging. The author is hoping to present long term results at a later date.

Keywords: Cervical disc degeneration, Arthroplasty, Outcome

**EP-0467 [Spine and Peripheral Nerve » Degenerative Spine]
Dysphagia After Anterior Cervical Discectomy and Interbody Fusion: Prospective Study with Follow-Up 1 Year**

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Background: The incidence and severity of dysphagia after anterior cervical discectomy and fusion (ACDF) are variable and depend on many factors.

Method: This is a prospective single-center study, follow-up 1 year. The study included 73 patients after one- or two- level ACDF. The severity of dysphagia was prospectively evaluated by Bazaz-Yoo dysphagia score before surgery, six weeks, three, six and 12 months after surgery. The influence of factors such as gender, age, number of operated segments, smoking, gastroesophageal reflux disease, hypertension, duration of surgery and pre-existing dysphagia on the incidence of dysphagia after surgery was verified. The correlation between the duration of surgery, age and severity of postoperative dysphagia was studied.

Results: Any significant relationship was not proved between gender, age, number of segments, pre-existing dysphagia, gastroesophageal reflux disease, hypertension and the incidence of dysphagia after surgery. Smokers had a significantly lower incidence of dysphagia before surgery and within 12 months after ACDF ($p < 0.05$). The duration of surgery over 90 minutes significantly increased the incidence of dysphagia within three months after ACDF ($p < 0.03$). Any significant correlation between the duration of surgery, age and severity of postoperative dysphagia was not confirmed.

Conclusion: Factors such as pre-existing dysphagia, gender, age, number of operated segments, gastroesophageal reflux disease and hypertension have no influence on the incidence of dysphagia after ACDF. Smoking is a preventive factor for dysphagia before surgery and after ACDF. Duration of surgery is a potential risk factor for incidence of dysphagia after ACDF.

Keywords: Dysphagia, Anterior cervical discectomy, Risk factors

**EP-0468 [Spine and Peripheral Nerve » Degenerative Spine]
Segmental Range of Motion Preservation After Dynamic Stabilization of the Lumbar Spine in Military Patients: Analysis with Flexion-Extension CT**

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Dynamic stabilization of the lumbar spine is a well-established technique for motion preservation in treating lumbar spinal disease. Young patients with one or multi-segmental degenerative disease of the lumbar spine are not uncommon in the military, where high biomechanical and physical requirements are routine. Military activities, including parachuting, use of heavy backpacks and special force operations require lumbar movement preservation. We describe the experience of the Neurosurgery Department of Sao Paulo Military Area Hospital, Brazilian Army, in the surgical management of lumbar spine disorders with Dynesys system

(*) (Zimmer Spine, Warsaw, IN) and analysis of range of motion preservation with volumetric neutral-flexion-extension lumbar spine CT imaging. Retrospective data of all patients who underwent operation by this technique at this hospital in the last two years was collected. Characteristics as age, gender, etiology, time to return to unrestricted military activities were raised. Three CT volumes of the lumbar spine, 1 in neutral position, 1 in flexion and 1 in extension, were obtained in each patient and then analysed with a specific imaging tool. Motion between the endplates in vertebrae with screws, as well as motion between these endplates and adjacent vertebrae, were measured. Dynamic stabilization of the lumbar spine is an extremely important tool in the treatment of military personnel, who should have motion preserved whenever possible.

Keywords: Dynamic stabilization, Lumbar spine, Military, Dynamic computed tomography

**EP-0469 [Spine and Peripheral Nerve » Degenerative Spine]
Tattoos in Neurosurgery - Are Those Relevant?**

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Aim: To evaluate the outcome with regard to the post operative scar overlying the tattoos in patients undergoing lumbar spine surgery.

Method: This is a retrospective review of the results following lumbar spine surgery. All those patients undergoing lumbar spine surgery between April 2008 and April 2014 who consented to having their tattoos photographed before and after the operation were included in the study. All those patients who were included in the study had their pre-operative photographs of the operative area including tattoo taken. Most of those patients had their post-operative photographs also taken at variable interval of time depending on their convenience.

Results: Majority of the patients had their tattoos preserved and their satisfaction ranged from good to excellent. Some of these were substantiated by the original tattoo artists whom the patients visited post-operatively for evaluation and re-doing.

Conclusion: It is possible to preserve the tattoos in the operative field provided meticulous technique of surgical incision and wound closure is employed.

Keywords: Lumbar spine surgery, Tattoos, Art

**EP-0470 [Spine and Peripheral Nerve » Degenerative Spine]
Pre and Postoperative Neck Pain in Patients with Cervical Spondylotic Myelopathy Treated by Cervical Laminectomy**

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Background: Axial neck pain is common complication that follows posterior cervical surgery. This study analyzes the amount of axial neck pain before and after non-instrumented posterior cervical laminectomy, and correlates neck pain with the clinical outcome of surgery.

Method: 38 patients with cervical spondylotic myelopathy surgically treated by posterior cervical laminectomy without instrumentation were included in the study. All patients were assessed preoperative

and at 3 and 9 months post operative for neck pain using visual analog score (VAS). Patients were also evaluated clinically by modified Japanese Orthopedic (mJOA) score and radiologically by MRI and X-ray for the degree of cervical lordosis. Patients are classified according to preoperative neck pain VAS into two groups, pain free group with VAS<2 and pain group VAS ≥2.

Results: Of the the pain group (n=20), 7 patients continue to experience post operative neck pain at 3 month and decreased to 5 patients at 9 month. The pain free group n=18 had 5 patients experienced postoperative neck pain at 3 months and decreased to 4 cases at 9 months. After 9 months postoperative the patients who had neck pain showed significant decrease in degree of cervical lordosis than pain free patients however no significant difference in surgical outcome.

Conclusion: There is significant decrease in post operative neck pain after cervical laminectomy, however the development of neck pain in the pain free group was associated radiologically with decrease in cervical lordosis without affecting the recovery rate and lateral mass fixation should be considered in this cases.

Keywords: Cervical spondylotic myelopathy, Neck pain, Cervical laminectomy

EP-0471 [Spine and Peripheral Nerve » Degenerative Spine] Midterm Outcome of Thoracic Disc Herniations that were Treated by Microdiscectomy with Bilateral Decompression via Unilateral Approach

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Background: Thoracic disc herniations surgery carries risks of neurological worsening due to thoracic cord retraction injury. Multiple approaches have been developed aiming at resecting the disc herniations of thoracic segment. We have conducted a prospective study to evaluate the midterm outcome of thoracic microdiscectomy with bilateral decompression via unilateral approach.

Method: Patient were checked preoperative, postoperative, and late follow-up by Oswestry Disability Index (ODI), Visual Analogue Scale (VAS), and radiological images. Twenty three patients were treated for thoracic disc herniations by microdiscectomy with bilateral decompression via unilateral approach between 2010 and 2015.

Results: Nine patients were female, fourteen were male, and all of those mean age was 51.2±8.3 (range 29–64 years). The mean follow-up time was 1.9 years (range 1–5 years). The ODI and VAS scores decreased significantly in both postoperative and late follow-up evaluations.

Conclusion: Microdiscectomy with bilateral decompression via unilateral approach for thoracic disc herniations allowed sufficient and safe decompression of the neural structures, and resulted in a significant reduction of symptoms and disability.

Keywords: Thoracic disc surgery, Microdiscectomy, Bilateral decompression via unilateral approach

EP-0472 [Spine and Peripheral Nerve » Degenerative Spine] The Dynamics of the Postoperative Period After Lumbar Microdiscectomies

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Background: Identify the dynamics of patients after operation for a herniated disc: microdiscectomy, microdiscectomy with using local application steroids, microdiscectomy with implantation systemy DIAM (Device for Intervertebral Assisted Motion).

Method: During 2009-2015 years, 1271 patients were operated on of herniated discs in the lumbar spine. The average age of patients was 43,5 years. Men -52%, women - 48%. Microdiscectomies was made in 1124 (survey results received from 56 patients - Group 1) microdiscectomies with application steroids - 41 (results received from 20 patients - Group 2) microdiscectomies with stabilization interspinous systems - 147 (respectively 43 - group 3). The last set when lowering the intervertebral disc for the prevention of the progression. Assessed the condition of patients before operation, after, 3, and 6 months at the time of the survey and the scales VAS and NASS. The average time from operation to the survey was 2 years and 6 months.

Results: We marked improvement of early postoperative period in group 2 (VAS -2,05, NASS-37,5) compared with group 1 (VAS-4,85, NASS-38,93) and group 3 (VAS-4 17, NASS-30,74). After 6 months results in a between groups were not significantly different. Number relapse herniated disc is different between the groups (4 cases among all groups together).

Conclusion: Microdiscectomy remains the “gold” standard for the surgical treatment of herniated intervertebral discs. The use of local application steroids after removing the hernia, provides a more comfortable course early postoperative period in patients. The feasibility of using interspinous systems stabilization questionable.

Keywords: Lumbar intervertebral disc herniations, Microdiscectomy, Dynamics

EP-0473 [Spine and Peripheral Nerve » Degenerative Spine] Postoperative Complications After Removal of Intervertebral Hernias of the Lumbar Spine

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Method: The analysis of the immediate results of surgical treatment of 342 case histories selected from those operated with lumbar degenerative disc disease during 2000-2010. Men 176, females 165. Age 18 to 70 years. 76% of patients were aged between 31 and 55 years. The average age of 40.5 years. All patients underwent a comprehensive examination standard. All operations were performed under general anesthesia, at a position on the healthy side. Interlaminary approaches applied in 320 patients, including without resection of bone structures of 170 patients with resection margins arches (arcotomy) 150, hemilaminectomy in 22 patients.

Results: In 337 (98.5%) patients in the surgery discoradicular conflict was detected. Among this category of patients 193 (57.3%) of the disc removal of complementary curettage cavity disk. In 144 patients (42.7%) were removed only fallen fragment of the nucleus pulposus and any manipulations in the cavity of the disk with the purpose to eliminate the residual was not performed. Five patients (1.5%) were operated on for spinal canal stenosis. In 22 patients with disc herniation combined with stenosis of the spinal canal.

Conclusion: Despite the fact that 93.2% of the operated patients had a 1st and 2nd levels of performance on the 2nd day after the surgery, recurrence of pain radicular syndrome have reached 19.6%. The most effective and pathogenetically substantiated treatment recurrence of pain radicular syndrome is an injection of steroids into the epidural space.

Keywords: Degenerative disc disease, Compression of the nerve roots, Disco-radicular pain

EP-0474 [Spine and Peripheral Nerve » Degenerative Spine]

Role of Atlantoaxial and Subaxial Spinal Instability in Pathogenesis of Spinal 'Degeneration' Related Cervical Kyphosis

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Background: The role of subaxial and atlantoaxial instability in the pathogenesis of 'degeneration' related cervical kyphosis is evaluated.

Method: During the period 2013 to 2016, the authors treated 21 patients having cervical kyphosis that was related to degenerative spinal disease. The patients presented with symptoms related to cervical myelopathy. Kyphosis was diagnosed on the basis of described radiological parameters. The patients were divided into three groups. Group A (10 patients) had manifest radiological evidences of atlantoaxial dislocation, type 1 facetal instability, abnormal increase in atlantodental interval and evidences of cord compression by the odontoid process. Group B (5 patients) had axial or central atlantoaxial facetal instability (type 2 or 3 atlantoaxial facetal instability) and subaxial spinal instability. Group C (6 patients) had subaxial spinal instability. The patients were treated by only stabilization. Group A patients underwent atlantoaxial fixation, group B patients underwent atlantoaxial and subaxial fixation and group C patients underwent only subaxial spinal fixation. The operation was aimed at arthrodesis of the spinal segments. No bone or soft tissue decompression was done.

Results: During the minimum follow-up period of 6 months, all patients improved in their neurological symptoms and demonstrated evidences of spinal arthrodesis. There were no major surgical complications.

Conclusion: Spinal instability plays a major role in the generation of cervical spinal kyphosis. Atlantoaxial instability may form the primary and nodal site of development of the process of spinal degeneration in general and kyphosis in particular.

Keywords: Atlantoaxial dislocation, Cervical kyphosis, Spinal instability, Facetal fixation

EP-0475 [Spine and Peripheral Nerve » Degenerative Spine]

The Stand-Alone Cervical Cages with Integrated Screw Fixation: Results in 355 Consecutive Operated Levels

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Background: Cervical disc disease at C2/3, C3/4 and C7/T1 is less common. Fusion with cages & plating is the standard treatment at these levels. This is not without significant risks related to the need of larger exposure and anterior muscular dissection. Stand-alone cages with integrated screw fixation obviate the need for plating and larger exposure. Our aim is to assess cage related morbidities and fusion rates in Stand-Alone cages.

Method: 355 levels were operated in 273 patients from February 2009 to February 2016. Single and Multilevel cages were performed in 211 and 62 patients respectively. 211 of the 273 patients underwent single level discectomy with Stand-Alone cervical cages with Integrated Screw Fixation from C2/3 to C7/T1 levels. 62 patients underwent 144 multi-level discectomies with Stand-Alone cervical cages with Integrated Screw Fixation.

Results: Operative time was shorter. There was no reported permanent exposure/ cage related morbidities in all operated levels. 3 patients with traumatic disc disruption required further surgery for lateral mass fixation. 12 patients had mild dysphagia that resolved during follow up with no patient having complains of dysphagia at 3- months follow up. Fusion rates were 95% at single & 90% at multi-level discectomies at the last follow up. No patient required cage related surgical revision.

Conclusion: The current results support the use of Stand-Alone cervical cages with Integrated Screw Fixation especially at difficult levels at C2/3 and C7/T1 and in multi-level discectomies as it obviate the need for plating and larger exposure with less reported dysphagia and implant related complications.

Keywords: Stand Alone, Cervical, Cages,

EP-0476 [Spine and Peripheral Nerve » Degenerative Spine]

Evaluation of Lumbar Spondylolisthesis and Posterior Lumbar Pedicle Screw-Rod Stabilization-Fusion: A Retrospective 63 Cases

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Aim: To investigate the clinical and radiological outcomes of posterior lumbar pedicle screw-rod stabilization and fusion.

Method: Sixty-three cases who operated for spondylolisthesis between January 2011 and June 2016 at Haydarpaşa Numune Education and Research Hospital were retrospectively studied. Data were analyzed: Age, sex, neurological examination, radiologic parameters -Meyerdig grade, slippage percentage, slip angle, sacral slope, lumbar lordosis, lumbosakral kyphosis-, types of

spondylolisthesis, surgical approach, complications, postoperative results and fusion.

Results: Mean age was 57.16±12.55, male/female ratio was 1/2.1. Degenerative spondylolisthesis was 55.6%. Most common sign was neurogenic claudication and level was L4-5 of all cases. Surgical approach was posterior lumbar pedicle screw-rod stabilization and otogen (with or without allogeneic) bone graft fusion in all cases, 95.2% of cases also underwent decompression and 28.6% also microdiscectomy. Preoperative and postoperatively: slippage percentage: 27.9% and 16.5%, slip angle: -10.62±5.950 and -6.96±4.590, sacral slope: 36.93±7.58 and 35.60±7.36, lumbar lordosis: 52.14±8.43 and 50.96±6.97, lumbosakral kyphosis: 30.27±10.090 and 29.79±8.750. Meyerding Grades: 36.5% were Grade I, 61.9% were Grade II preoperatively and 90.5% were Grade I postoperatively. 84% of motor deficits and all sphincter deficits were completely improved. Most common complication was noninfected wound drainage as 7.9% (n=5). Overall fusion rate was 97%.

Conclusion: The use of fixation and bone fusion with transpedicular screw is the most advanced and effective method in the treatment of spondylolisthesis. This system provides high fusion and stability, pseudoarthrosis risk is reduced, progress in slip is stopped and neurological improvement is achieved.

Keywords: Radiologic parameters, Spondylolisthesis, Lumbar, Retrospective, Surgical treatment

EP-0477 [Spine and Peripheral Nerve » Degenerative Spine]

Range of Motion of the Cervical Spine After Cervical Arthroplasty with Discover – Preliminary Results of the Ongoing Study

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Aim: To define the influence of the arthroplasty on the range of motion of the cervical spine

Method: This study is currently being performed at the Department of Neurosurgery, Medical School University of Zagreb. Static and dynamic cervical radiographs of patients who have had cervical arthroplasty because of one-segmental cervical disc herniation would have been compared with the cervical radiographs of the same patients before the surgery, and with the radiographs of the control group. The group of patients who underwent cervical arthroplasty consists of the patients who were operated at the Department of Neurosurgery, University Hospital Centre Zagreb in the period of five years (2011-2016). The control group consists of healthy volunteers. The range of motion of the cervical spine will be calculated after the computer analysis (Osirix Mac) of the static and dynamic cervical radiographs.

Results: After the radiographs have been analysed, preliminary results showed that the range of motion of the cervical spine after cervical arthroplasty is increased at operated level but also overall when it was compared with the range of motion of the cervical spine before the arthroplasty.

Conclusion: Preliminary results of this study indicate that the range of motion of the cervical spine is increased after the cervical arthroplasty was implemented. It confirms that cervical arthroplasty

has influence on the entire biomechanics of the cervical spine and that effect is not fully understood yet.

Keywords: Cervical spine, Cervical arthroplasty, Range of motion

EP-0478 [Spine and Peripheral Nerve » Degenerative Spine]

Neurological Recovery and Radiological Evaluation After Surgical Decompression in Patients with Cervical Myelopathy

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Background: Long-term functional prognosis and outcome of treated patients with cervical myelopathy depend mainly on surgical procedures. This study aims to evaluate the pattern of neurological recovery as well as the postoperative radiological findings, taking account of the collected clinical data and the surgical techniques used.

Method: We analyzed 50 cases of patients suffering from cervical myelopathy who underwent surgery between March 2012 and January 2015. Patients were assessed clinically using the JOA (Japanese Orthopaedic Association) and Nurick scores and radiologically, before and after surgery.

Results: The average age was 58.7 years with a male predominance (74%). Cervicalgia (94%), walking disorders (92%) and cervico-brachial neuralgia (80%) were the most predominant clinical symptoms. The average duration of symptoms was 18.8 months. All patients underwent cervical decompression surgery through anterior (46%), posterior (52%) and combined (2%) approaches. The Nurick mean score passed from 3.5 preoperatively to 2.25 postoperatively and the JOA mean score increased from 11.4 preoperatively to 14.2, 2 years after surgery. The average of the recovery rate reached its highest (44.7%) 3 months postoperatively and stabilized thereafter. Severity of preoperative neurological impairment (p=0.027), the degree of narrow cervical canal (p=0.031), and intramedullary hyper-signal on magnetic resonance imaging (p=0.042) were the main factors that had a significant impact on patients' neurological improvement.

Conclusion: The kinetics of neurological recovery appears to be rapid within 3 months following the surgical decompression, after which it became stable regardless of the surgical technique used.

Keywords: Cervical spine, Myelopathy, Surgical decompression, Functional recovery

EP-0479 [Spine and Peripheral Nerve » Degenerative Spine]

Microsurgical Discectomy According to the Caspar Technique: Our Experience

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The degenerative disease of the intervertebral disc and back pain are

chronic conditions and represent an important cause of morbidity and mortality. Treatment of lumbar radicular compressive syndromes is described, as well as the success of microsurgical procedure according to the Caspar technique. In the prospective study, 100 patients were included. All suffered from the radiculopathy due to the nerve compression. Conservative treatment was not successful and operation was then performed. The follow up of patients was evaluated from 1 to 3 years after the operation, the average time was 17 months. The results showed excellent outcome in 67%, good outcome in 28%, fair in 1% and poor in 3% of patients. One patient died one month after the operation due to unrelated reasons and was not included in the final assessment. Thus, the total result was satisfactory in 95%. The results of microsurgical approach showed that the efficiency of such operation in this series can be compared with similar results elsewhere according to the international criteria (88% to 98%). The successfulness of the microsurgical method is due to gentle tissue handling, especially with respect to the nerve structures in the spinal canal and considerably smaller injury if muscles and bone. This is achieved by better visibility and field magnification with the operative microscope.

Keywords: Discectomy, Caspar technique, Minimally invasive, Surgery

EP-0480 [Spine and Peripheral Nerve » Degenerative Spine] Predisposing Factor for Adjacent-Segment Failure Following Lumbar Fixation for Degenerative Instability

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Background: Adjacent-segment failure is a well-known risk of lumbar fixation. The aim of these retrospective study was to identify risk factors for next-segment failure in lumbar fixation for degenerative instability.

Method: We retrospectively evaluated 122 patients who underwent of lumbar fixation for degenerative instability from 2011 to 2014 in faculty of medicine Cairo University. All procedures were performed by a single surgeon. The patients with next-segment failure underwent, neurological assessment, radiographic studies and sequential follow-up examinations. The mean follow-up period for this group was 30 months.

Results: 33 patient of 122 fusion procedures were performed in women who were postmenopausal. A total of 19 patient of 125 patients developed symptomatic next-segment degeneration at a previously asymptomatic level; 15 were postmenopausal women. All women were postmenopausal, and 50% received bisphosphonate drugs and calcium supplementation preoperatively for osteopenia. Twenty percent of all patients with next-segment failure were cigarette smokers. Next-segment diseases included spondylolisthesis (52%), spinal canal stenosis due to disc herniation and/or facet hypertrophy (33%), stress fracture (12%), and scoliosis (3%). Patients may had more than one degenerative process at the next segment.

Conclusion: Postmenopausal women show the highest risk of adjacent-segment failure for patients in whom lumbar fusion with rigid instrumentation is performed to treat degenerative instability.

Keywords: Degenerative, Instability, Postmenopausal

EP-0481 [Spine and Peripheral Nerve » Degenerative Spine] Evolution and Analysis of 508 Cases of Lumbar Discal Hernia Treated with Hemilaminoforaminotomy and Discectomy

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Aim: To demonstrate favorable results can be obtained by making hemilaminectomy with foraminotomy and discectomy for herniated lumbar disc disease (HLDD). HLDD is a common affliction. Surgical intervention usually provides excellent results. We intend to prove that Discectomy with hemilaminoforaminotomy through a small incision permits an accurate decompression of the nerve root with results from good to excellent.

Method: 508 patients underwent surgical intervention for herniated lumbar disc disease between 1996 and 2017: 231 women and 277 men. Age range was 14 to 83 with (48.5 years average). All the patients had nerve root pain in a dermatome pattern due to herniated lumbar disc disease. They were evaluated with MRI and some of them with CT. Patients older than 60 (147 patients) had foramen stenosis. Patients were treated with hemilaminoforaminotomy and discectomy: 269 patients were operated on 1 level, 193 on 2 levels and the other 46 patients on more than 2 levels.

Results: The outcome results were collected at a range from 2 months to 20 years. Over 335 patients have a 10-year follow up. Hospitalization was from 12 to 24 hours. The results were defined according to Macnab's scale as Excellent 84%, Good 10%, Regular 4% and Poor 2%.

Conclusion: The results of these series indicate that most patients with HLDD do well after hemilaminoforaminotomy with discectomy and nerve root decompression. It is safe and it does not have destabilization risk.

Keywords: Lumbar disc disease, Hemilaminectomy, Foraminotomy, Discectomy

EP-0482 [Spine and Peripheral Nerve » Degenerative Spine] Lumbar Synovial Cyst Presenting with Radiculopathy

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Synovial and ganglion cysts are rare and are also referred to as juxtafacet cysts. These are intraspinal lesions that can cause radiculopathy symptoms and mimic disc hernias. It is most common in the lumbar region of the spine and most commonly in the L4-5 level. In general, it is associated with adjacent facet joints degeneration or arthritis. Histologically, synovial cyst is the swelling of the synovial covering. We would like to present a case of L4-5 facet cyst, referring to our clinic with radiculopathic findings. A 63-year-old male patient was suffering from back and leg pain from the waist and both hips. There was no neurodeficit on physical examination. MR imaging revealed hypertrophic and degenerative changes in the

bilateral facets at L4-5 level and degenerative cyst formation which narrowed the spinal canal. The patient was operated and the cysts adjacent to the facet joints were excised. Radiculopathy complaints of the patient were gone after the operation. Juxtafacet cysts are a rare cause of lumbar radiculopathy. In cases where conservative treatment is not successful, this differential diagnosis is a condition that should be kept in mind.

Keywords: Synovial, Cyst, Lumbar, Radiculopathy

**EP-0483 [Spine and Peripheral Nerve » Degenerative Spine]
Patterns and Outcomes of Surgically Treated Lumbar Disc Herniation Among Patients at Moi Teaching and Referral Hospital, Eldoret - Kenya**

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Aim: To assess the patterns and outcomes of surgically treated lumbar disc herniation among patients at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya.

Method: This was a longitudinal study that involved follow up of patients post operatively for up to 4 weeks.

Results: Forty eight patients were studied. The most common risk factor was heavy weight lifting (68.8%). Diminished ankle jerk (75%) was the most common reflex change noted. Foot drop was seen equally in 34% of patients with L4/L5 and L5/S1 disc herniations. SLR test was positive in 98%. Extrusion (79%) was the most common type of HLD, while Postero-lateral(92%) was the most common location. Intra- operative complications were noted in 14.6%. The median post-operative VAS was 1 (IQR 0-2) from the median pre-operative VAS of 8(IQR 7-9). At 2 weeks post-operatively, 45.8% equally reported excellent and good outcome according to the MacNab's criteria while at 4 weeks, 66.7% reported excellent outcome while 29.2% reported a good outcome.

Conclusion: Most common age group affected was in the 40-50 years bracket. Diminished ankle jerk reflex showed a clear prediction for lower lumbar disc herniation. Sensory examination revealed a considerable overlap of dermatomes, SLR test showed a high diagnostic performance for HLD. The type and level of disc herniation did not affect the outcome following microdiscectomy. Intra- operative and post operative complications were not common findings. Functional outcome assessment at 4 weeks, showed significant positive change. Microdiscectomy, has a high success rate for patients with HLDs.

Keywords: MTRH, HLD, VAS

**EP-0484 [Spine and Peripheral Nerve » Degenerative Spine]
Comparison Suboccipital Pain, Range of Motion and Clinical Outcome in Patients with Os Odontoideum and Non Os Odontoideum Treated with Atlantoaxial Fixation**

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Aim: To compare the effect of atlantoaxial fixation on suboccipital pain, ROM and clinical outcome in patients with os odontoideum (OO) and non os odontoideum (non OO).

Method: Group A 22 OO patients and Group B 20 non-OO patients included in this study. Standing plain radiographs of the cervical spine were obtained pre- and postoperatively cervical spine alignment was assessed with the following 5 parameters: the Oc-C1, C1-2, C2-3, C2-7 Cobb angle, C2-7 sagittal vertical axis (SVA). VAS and JOA scores were obtained in all patients pre- and postoperatively.

Results: Group A the average age was 43.68±15.50 years, 19 male patients and 3 female and follow-up 24.23 ± 19.17 months. Pre- and postoperative C1-2 cobb angle were 26.02 ± 10.53° and 22.82 ± 8.3° respectively (p=0.03). Pre- and postoperative C2-7 SVA were 19.36±10.31 mm and 13.7±9.48 mm respectively (p=0.02). Odontoid tip floating in 22 patients (100%). Group B the average age was 52.95±14.82 years, 11 male and 9 female and follow-up 24.7±11.8 months. Pre- and postoperative of C2-7 cobb angle were 16.76±9.44° and 12.76±9.14° respectively (p=0.01). C1-2 changes were 3.2±7.3 in group A and -1.47±7.21 in group B (p=0.022). C2-7 changes in SVA were 5.64±11.56 mm in group A and -0.51±6.57 mm in group B (p=0.02).

Conclusion: After fixation, atlantoaxial loss of lordosis by floating odontoid tip will be marked in OO but realignment was observed. Non OO tended to exhibit a greater subaxial loss of lordosis.

Keywords: Atlantoaxial instability, Odontoid tip floating, Os odontoideum, Loss of lordosis

**EP-0485 [Spine and Peripheral Nerve » Degenerative Spine]
Phantom Radiculopathy: Case Report**

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Phantom pain, described by French military surgeon Ambrois Pare in 17 century, is defined as the pain of the amputee limb. Lumbar disc hernia is most common cause of radicular pain, and effects 1% of population every year. Less than 20 case of phantom radicular pain are reported in literature until today. In our study, we present a case about 75-year-old man who is right leg amputated 7 years ago suffer from phantom radicular pain because of right L3-L4 disc hernia. 75 years old man who is operated left L5-S1 disc hernia about 10

year ago and amputated right leg 7 years ago due to thromboangiitis obliterans, suffered from low back pain, and right leg pain. Right paracentral extrude disc hernia detected in his magnetic resonance imaging (MRI). We offered him surgical treatment. Right L3 hemipartialaminectomy + L3-L4 microdiscectomy and right L4 foraminotomy was performed. After the operation, patient's right leg phantom radicular pain was over. Previous studies enounce that lumbar degenerative diseases are caused from abnormal walking posture of limb amputated patients. When we observed incipient phantom pain with limb amputated cases, lumbar degenerative disease should be kept in mind.

Keywords: Phantom pain, Radiculopathy, Amputee

EP-0486 [Spine and Peripheral Nerve » Degenerative Spine] Kifo- and Vertebroplasty with Compression of Vertebrae of Various Origin

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Aim: To determine the dynamics of pain in patients after performing puncture percutaneous vertebro- and kyphoplasty (VP and KP) with compression of vertebrae of various genesis.

Method: We operated 50 patients using KP method, and 411 patients VP method. All patients were sent questionnaires in which noted VAS, before the operation and at the time of the survey.

Results: KP index on VAS before operation was $8,67 \pm 0,91$, after operation - $2 \pm 2,93$. The time from operation to the time of the study was $1,5 \pm 0,8$ years. In the VP group, the VAS before operation was $8,54 \pm 1,43$, after the operation - $3,82 \pm 2,99$. The average catamnesis is $1,28 \pm 1,33$ years. In the 6 observation KP and 32 VP there was a cement output beyond the boundaries of the vertebral body, 2 in the spinal canal. This complication did not lead to serious consequences in any case, and proceeded asymptotically. All patients were activated 2-3 hours after the operation, followed by discharge on the this day or the next day. Complications associated with early activation of patients we are not noted.

Conclusion: Puncture vertebro- and kyphoplasty are effective methods of treatment of pain syndrome, which significantly and quickly improve the condition of patients for a long time.

Keywords: Kyphoplasty, Vertebroplasty, Vertebra body fracture

EP-0487 [Spine and Peripheral Nerve » Degenerative Spine] Activation After Lumbar Microdiscectomy. Myth or Reality?

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Aim: To determine whether it is appropriate to refrain from early patients activation after lumbar microdiscectomies including sitting.

Method: Included 136 patients with a herniation of the intervertebral disc in lumbar spine segment during 2015-2016yy. Patients were allowed to sit down and get up after surgery immediately after surgery. Duration of walking, sitting, squatting, bending was not limited since the first day of the postoperative period. Herewith, all of the patients were operated by the same surgeon, using the same

method (standard microdiscectomy). Patients were assessed by NPS and OSWESTRY scales before surgery and at the time of the survey. **Results:** We were able to collect survey data from 57 patients (29 - 2015 and 28 - 2016). The average NPS rate before operation in 2015 amounted 9.62, in 2016 - 9.53. OSWESTRY for 2015 - 77.2%, 2016 - 56.6%. At the time of the survey results were distributed as follows: NPS 2015 - 2.5, 2016 - 3.57; OSWESTRY 2015 - 4.2%, 2016 - 15.2%. Among the operated patients we noted 3 observations of recurrence of a herniated disc, with 2 of them that were early (within 30 days from initial operation).

Conclusion: The activation mode "without restriction" of patients after lumbar microdiscectomies is safe. Stay in a sitting position immediately after surgery does not affect the likelihood of recurrence of a herniated disc, while significantly improves the quality of life of patients in the early postoperative period.

Keywords: Herniated disc, Lumbar microdiscectomy, Activity

EP-0488 [Spine and Peripheral Nerve » Degenerative Spine] Spontaneous Regression in Lumbar Disc Hernia: Case Report

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Surgical treatment for lumbar disc hernia has been operating for many years but the most effective treatment method of lumbar disc hernia is still being debating. Mostly patients complaints regression with conservative treatment. Spontan regression in disc hernia described by Guinto in 1984. We present a case with extrudate L5-S1 disc herina which is spontaneous regressed. 47 years old women suffered from right leg and low back pain. In her neurological examination, right laseque sign was positive at 30 degree in right leg, and she had weakness of right toe extantion. We offered surgical treatment but she refused. We refered her to physiotherapy. After 5 months she was seen in our clinic. In the meantime she did not take any treatment except non-streoidal antienflamatuar drugs and her complaints was over. In her lumbar magnetic resonance imaging (MRI) L5-S1 extrude disc hernia was regressed. In the literature, a lots of case was reported about spontaneous regression of lumbar disc hernia but mechanism of this regression can not be explained. In lumbar disc hernia cases with progressive neurological and symptomatic worsening, surgical treatment is first choice. Even though we must not forget the spontaneous regression with conservative treatment in patitens who have additional risk factors for operation or refuse the operation.

Keywords: Spontan regression, Lumbar disc hernia, Radiculopatı

EP-0489 [Spine and Peripheral Nerve » Degenerative Spine] Evaluation of Spondylolytic Clefts and Outcomes of Posterior Pedicle-Screw Surgery of Patients with Isthmic Spondylolisthesis: A Retrospective Study

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Aim: To evaluate isthmic spondylolisthesis patients according to spondylolysis type that underwent posterior lumbar stabilization.

Method: Twenty-six cases who operated for isthmic spondylolisthesis between January 2011 and June 2016 in our clinic were retrospectively studied. Data were analyzed: Age, sex, neurological examination, Meyerding grades, types of spondylolisthesis, coexist vertebral pathologies, surgical approach, complications, postoperative results and fusion. Spondylolytic clefts were evaluated via computed tomography.

Results: Mean age was 52.4 (between 27 and 73 years), male/female was 3/10. Most common sign was neurogenic claudication and level was L4 (50%) of all cases. 16 cases (61.5%) were type 2A. Shortest symptom duration was in type 2C. Only 1 case (3.8%) had unilateral pars defect. 4 cases (15.3%) were retrolisthesis. Most coexist vertebral pathology was degeneration (61.5%) and 100% over 55 years. Our surgical approach was posterior lumbar pedicle screw-rod stabilization with bone graft fusion in all cases, 24 cases (92%) also underwent decompression and 6 cases (23%) also microdiscectomy. Meyerding Grades: 8 (30.7%) were Gradel, 17 (65.3%) were Gradel preoperatively; 23 (88.5%) were Gradel and 3 (11.5%) were Gradel postoperatively. 86% of motor deficits and all sphincter deficits were completely improved. Most common complication was noninfected wound drainage in 2 cases (7.6%). Overall fusion rate was 96.1%.

Conclusion: Most common type of isthmic spondylolisthesis is 2A and it's more symptomatic in females and older ages, especially because of degeneration. Lumbar pedicle-screw stabilization and fusion is an advanced and effective method in the treatment.

Keywords: Isthmic spondylolisthesis types, Lumbar, Retrospective, Stabilization

EP-0490 [Spine and Peripheral Nerve » Degenerative Spine]

Cervical Disc Herniation: 10 Years Experience of Department of Neurosurgery of the University Hospital Ibn Sina of Rabat, Morocco

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Background: The cervical disc herniation is linked to a cracking of the annulus fibrosus with migration of part of the nucleus pulposus towards the spinal canal. They are the origin of a cervico-brachialgia. The goal of this study was to evaluate the cervical disc herniation in our department between January 2005 to December 2015.

Method: We conducted a retrospective study with duration of 10 years from January 2005 to December 2015. Medical records, radiographs, and clinical evaluations of consecutive patients who underwent non-traumatic cervical disc herniation were reviewed. Incomplete medical records were excluded. Out of 78 cases, 59 were included in this study.

Results: The mean of age was 49.3, the male sex was more represented with 57.63%, cervical neuralgia was found in 84.73%, with 92.87% of neurological deficits, and 33.9% of sphincter disorders. At least 54.23% of patients presented a pyramidal irritation. The radiological outcomes shown that the most affected level is C5-6 in 42.37%. Two patients had herniated disc staggered

on four levels. All patients was operated by anterior approach and in most of them iliac graft was performed in 64.4% of cases. 5.08% of patients receive an instrumented stabilization.

Conclusion: Our study focused on the evaluation of the frequency of this pathology affecting an active population with a direct impact on the functional status of these patients.

Keywords: Disc herniation, Cervical disc, Cervical spine

EP-0491 [Spine and Peripheral Nerve » Degenerative Spine]

Tophaceous Gout in Lumbar Spine

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Gout is a metabolic disorder primarily affecting joints in bones. It is more common in middle-age men. Defect in uric acid metabolism is the main reason to increase purine derivatives. Genetic disorders and oral intake of alcohol leads to provoke and alleviate arthropathies which is clinically seen as pain. Spine involvement of tophaceous gout is uncommon. 61 year old male with Gout history had progressive low back pain and neurogenic claudication. Motor, sensory or reflex deficit was not investigated in physical examination. Pain treatment had no response. Radiological findings showed no instability but L4-5 disc hernia with L3-4 and L4-5 spinal stenosis. Unfulfilled pain was the major indication to decide surgery. Preoperative clinacal and radiological signs showed no evidence of instability. L3 and L4 total laminectomy was performed with foraminotomies while preserving bilateral facets. Histological examination of chalky and cheese like material in L3-4 ligamentum flavum directed to the diagnosis of tophaceous gout of the lumbar spine. Tophaceous gout in spine is a rare. Differential diagnosis must include gout for an appropriate treatment. Surgical techniques of tophaceous gout in lumbar spine is about patient's age, pathology, comorbid diseases, preoperative radiological findings of stability and estimated instability.

Keywords: Tophaceous gout, Lumbar spine, Degenerative spine

EP-0492 [Spine and Peripheral Nerve » Degenerative Spine]

Effect of Modic Changes Type 1 Vertebral Involvement and Spinal Anatomy on Low Back Pain

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Background: The relationship between the size of modic type 1 (MD-1) change and pain in patients with backache without protrusion, extrusion and sequestration of lombar disc was not clearly stated in literature previously. The purpose of this study is to highlight this relationship.

Method: 49 patients who admitted to the outpatient clinic in march

2015-september 2015 with MD-1 change in the MRI were evaluated with the Oswestry pain scale (OPS). MD-1 area, height of the discs, number of Schmorl nodules in the MRI were evaluated. For the evaluation, the largest MD-1 affected area in the sagittal plane was detected. At this level the corpus was divided into 16 equal parts. Direct linear measurement was made for the height of the disc. Muscle size was measured by the axial area and degeneration of the disc was evaluated by the Phirrmann classification.

Results: The area of MD-1 and the pain score were directly proportional and this relationship was statistically significant. From the rest of the parameters only the Phirrmann classification was partially (at the L3-4 level) related with the intensity of pain.

Keywords: Modic changes type 1, Low back pain, Degenerative disc, Magnetic resonance imaging, Oswestry

EP-0493 [Spine and Peripheral Nerve » Degenerative Spine]

Long-Term Clinical Outcome and Reoperation Rate for Microsurgical Bilateral Decompression via Unilateral Approach of Lumbar Spinal Stenosis

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Background: Lumbar stenosis is a common spinal disease for degenerative process on lumbar spine. The aim of our prospective study is to evaluate long-term outcome and reoperation rate of surgery by microsurgical bilateral decompression via unilateral approach for lumbar spinal stenosis.

Method: Nine hundred and eighteen patients were treated for single or multilevel lumbar spinal stenosis by bilateral decompression via unilateral approach between January 2002 and January 2016. 180 patients of 918 underwent microdiscectomy with decompression. They were then followed-up postoperatively, at 6 and 12 months intervals with radiological investigations, ODI and SF-36 tests.

Results: Four hundred and ninety two were females (53,6%), whereas four hundred and twenty six were males (46,4%) whose mean age was 63,83±10,16 (range 43– 79 years). Duration of symptoms ranged from 4 to 49 months. Average follow-up time was 98 months (range, 25 and 168 months) and reoperation rate was 2.5%. The ODI scores decreased significantly in late follow-up evaluations and the SF-36 scores demonstrated significant improvement in late follow-up results.

Conclusion: Bilateral decompression via unilateral approach for lumbar spinal stenosis allowed sufficient and safe decompression of the neural structures, resulted in a highly significant reduction of symptoms and disability, acceptable reoperation rate, and improved health-related quality of life.

Keywords: Lumbar spinal stenosis, Bilateral decompression via unilateral approach, Reoperation rate

EP-0494 [Spine and Peripheral Nerve » Degenerative Spine]

Prospective Evaluation of Artificial Cervical Disc Implantations Up to 15-Year Results of 300 Patients and Complication Report

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Aim: To retrospectively evaluate pain resolution and clinical plus function scores through 15 years following cervical artificial disc implantation.

Method: This prospective random. case-series consisted of 300 patients presenting with radicular pain and axial neck pain caused by herniated discs. Patients underwent implantation of an artificial cervical disc, differ. types. Clinical outcomes measures were collected pre-operatively, and between 6 months and 15 years post op. Outcomes measures included the Visual Analogue Scale (VAS) for arm and neck pain, medication usage, the neck disability index, modified Oswestry index and the modified Mac Nab criteria's.

Results: Patient's age in years was distributed all patients reported neck and / or radicular arm pain VAS >6. Oswestry scores were also statistically distributed. No peri-operative complications were observed. All patients were observed and statistically checked and clinical, radiological and neurological examined in periods between 2 months up to 15 years. Drop out rate after 15 years: 2%. Complications post op: The study is reporting about cases of adjacent level pathologies and revision procedures.

Conclusion: The implantation procedure of artificial cervical disc's offers an exceptional treatment alternative since it provided. Results through 15 years demonstrated longevity of treatment success. A valid number of dislocations and bony re-stenosis of the neuroforamen caused by progressive ossification were observed. In summary, the rate of post op facet-joint pain syndrome is significant higher than in fusion cases. Rate of adjacent level syndrome with indication for resurgery (fusion): 7%.

Keywords: Artificial disc, Case selection, Complication avoidance

EP-0495 [Spine and Peripheral Nerve » Degenerative Spine]

Actigraphic Analysis of Patients with Cervical Disc Herniation

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Aim: To analyze the relationship between the severity of pain and sleep disorder using wrist actigraphy in patients with cervical disc herniation (CDH).

Method: Fifty patients with the diagnosis of CDH underwent subjective tests and actigraphic analysis in preoperative period, and at the end of postoperative first week and postoperative first month. The data of the subjective tests and actigraphic analysis were compared.

Results: There was a strong and statistically significant negative correlation between the subjective tests of Visual Analog Scale (VAS) for Pain 0-1-2 and the objective parameters of Sleep Onset Latency (SOL) 0-1-2 (rs= -0.798, p=0.009 – rs= - 0.832, p=0.006 – rs=- 0.710, p=0.004). There was a positive correlation between the subjective tests of VAS for Pain 0-1-2 and the objective parameters

of Sleep Efficiency (SEF) 0-1-2 (rs=0.721, p=0.006 – rs= 0.768, p=0.001 – rs= 0.748, p=0.001).

Conclusion: Actigraphy may be used for the evaluation of cervical disc surgery, as an alternative and objective test for sleep disorders.

Keywords: Actigraphy, Sleep disturbance, Cervical disc herniation

EP-0496 [Spine and Peripheral Nerve » Degenerative Spine] Use of Bone Scintigraphy in Spinal Fusion

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An instrumented fusion can fail if there is not enough support to hold the spine while it is fusing. Therefore, spinal hardware may be used as an internal splint to hold the spine while it fuses after spine surgery. However, like any other metal it can fatigue and break. In very unstable spines, it is therefore a race between the spine fusing, and the metal failing. A 47-year-old woman was operated due to cervical spondylotic myelopathy. Cervical single level corpectomy was performed. Cervical corpectomy cage, anterior plaque and screws were used for stabilization. Bone graft was inserted into the cage for fusion. We did not find any pathology in the cervical x-rays for one year. After one year, x-ray showed one broken screw. There was no displacement of the anterior plaque. On the postoperative imaging studies it was very difficult to tell if the patient's spine has fused, and it was even harder to determine if a further fusion surgery is necessary. We used bone scintigraphy to determine fusion. Scintigraphy showed fusion at the operation site. We follow up the patient and did not find instability. So we did not perform further operation to maintain fusion. We recommend bone scintigraphy before deciding reoperation after implant failure.

Keywords: Spinal fusion, Bone scintigraphy, Spinal instability

EP-0497 [Spine and Peripheral Nerve » Congenital Spine] Minimal Access Surgery of Chiari 0 and Chiari 1 Malformations

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Chiari 0 and Chiari 1 Malformations are routinely treated in Neurosurgical practice. Conventional surgical treatment entails significant tissue manipulation including long scalp incisions, wide muscular dissection at the skull base and upper cervical spine, generous bone removal of the occipital bone, C1, C2 laminae, which may result in significant postoperative pain, significant blood loss, long hospital stay and long time to recovery. Minimal access surgery of the spine has evolved from surgical treatment of lumbar degenerative conditions to surgery of spine tumors. The principles of minimal access surgery are applied to surgery of Chiari 1 and Chiari 0 Malformations. Our patient population undergoing minimal access surgery has shown comparable benefits and relief after surgical decompression, with less postoperative pain, less blood loss, shorter hospital stay and shorter time to fitness to work.

Keywords: Minimally invasive surgery of Chiari 1 and Chiari 0 malformations, Minimal access surgery of Chiari 1 and Chiari 0, Minimal access surgery

EP-0498 [Spine and Peripheral Nerve » Congenital Spine]

Management of Large Intrathoracic Meningocele: A Case Report

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Intrathoracic meningocele is a sacular protrusion of the meninges through a dilated intervertebral foramen or a bony defect of the vertebral column. These meningoceles remain asymptomatic, but back or radicular intercostals pain, cough, and dyspnea are possible manifestations. Kyphoscoliotic deformity of the thoracic spine is often associated. Giant intrathoracic meningoceles associated with neurofibromatosis are rare, and the standard treatment remains controversial. We report the case of large Intrathoracic meningocele, which was diagnosed in a 23 year-old female patient showing clinical features of neurofibromatosis type I, with kyphoscoliosis of the thoracic spine. This thoracic meningocele was successfully treated by cysto-peritoneal shunt.

Keywords: Large thoracic meningocele, Neurofibromatosis, Cysto-peritoneal shunt

EP-0499 [Spine and Peripheral Nerve » Congenital Spine]

Anterior Sacral Meningocele

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Anterior meningocele is a rare congenital malformation. Due to sacral bone defect, meningeal sac herniates anteriorly and it is usually asymptomatic. The patients may be present with constipation or urinary disorders or may be found during pelvic ultrasound. Presacral masses like teratoma or epidermoid cysts may accompany these meningoceles. In our case; an asymptomatic 31 years old female were undergone obstetric examination and ultrasound discovered a large pelvic cyst. Her magnetic resonance imaging (MRI) showed partial sacral agenesis along an anterior meningocele (12 centimeters) with multilobulated presacral teratoma or epidermoid cyst. Especially in asymptomatic patients differential diagnosis of the pelvic cysts are important. An careful preoperative planing should be made in these patients.

Keywords: Spinal meningocele, Presacral mass, Teratoma, Epidermoid cyst

EP-0500 [Spine and Peripheral Nerve » Congenital Spine]**Neglected Neurogenic Bladder as a Chief Complaint of Lipomyelocele in Children and Adult: Operate or not to Operate?**

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Lipomyelocele may cause wide range of symptoms, including neurogenic bladder. It is known that bladder function is harder to recover than of motor function. Should operation be performed in the absence of other significant symptoms? Here we present two cases of lipomyelocele in children and adult with neglected neurogenic bladder as their chief complaint. The risk of morbidity is considered high because motor and sensory function are still intact. Decision to operate was based on combination of neurologic examination, radiology, and urology study results. Microsurgical untethering was performed on both cases. The goals of operation are to debulk the intraspinal lipoma, free the nerve roots, cut filum terminale and perform safe closure. After three months follow up, neurogenic bladder symptoms achieved a satisfactory improvement. Multimodal assessment is crucial in deciding whether to operate in order to achieve improvement in neurogenic bladder symptoms.

Keywords: Tethered cord syndrome, Neurogenic bladder, Lipomyelocele, Microsurgery

EP-0501 [Spine and Peripheral Nerve » Congenital Spine]**The Result of Cranio-Cervical Decompression in Chiari I and II Malformation with Syringomyelia About 16 Patients**

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Aim: To report the result of our experience in management of chiari malformation I and II with syringomyelia.

Method: This series includes 16 patients who had syringomyelia with chiari malformation type I or II operated in our department of neurosurgery between 2006 and 2016. The average age of patient was 27 years with extremes between (6 – 46 years). All the patients presented syringomyelia syndrome and 3 patients had passive hydrocephalus. All the patients had sensitive disorders and 5 tetraparesia before surgery. All the patient had cranio-cervical decompression.

Results: Patient with chiari malformation type I 7 (44%) had C1 lamina decompression and the others with chiari type II 9(56%) had C2 lamina decompression. Three months after surgery all the patient report amelioration of their sensitive disorders and 2 of the five whom had tetraparesia begin to recover. The control at MRI three months after surgery show that the syringomyelia cavity decrease in all the patients.

Conclusion: This study like in literature show that cranio-cervical decompression is effective in chiari I and II malformation with syringomyelia.

Keywords: Syringomyelia, Chiari malformation, Cranio-cervical decompression

EP-0502 [Spine and Peripheral Nerve » Congenital Spine]**A Case of Arnold Chiari Malformation with Respiratory Failure**

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Arnold Chiari malformation is defined as downward displacement of the brainstem and cerebellum through the foramen magnum. It has different clinical presentations and four subtypes. It is known that downward migration of posterior fossa components through the foramen magnum and associated lower cranial nerve palsy and brainstem compression can cause respiratory failure. Acute respiratory failure could mark the onset of the disease. Posterior fossa decompression performed to treat primary disease can improve the central sleep abnormalities. As respiratory failure is rarely seen, the poster will present a case of 26 year old women presenting with respiratory failure revealing an Arnold Chiari malformation.

Keywords: Arnold-chiari malformation, Respiratory failure, Hypercapnia

EP-0503 [Spine and Peripheral Nerve » Infection]**Primary Epidural Hydatidosis of the Spine: Case Report and Literature Review**

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36yo farmer patient, with no past of medical history, presented with back pain, progressive weakness and numbness in both legs evolving for 1 week. Neurological exam showed paraplegia. CT scan and MRI showed an intracanalicular cyst lesion with regular contour and extradural location with dimensions of 3,8cm craniocaudally leading to an excessive spinal cord compression on T12, L1. Blood serology was positive; there was no biological or imaging proof of liver localisation. The patient was operated with a T12, L1 laminectomy and the cyst was removed totally. Histopathological examination confirmed the diagnosis. The patient had an excellent recovery, he could walk without help at his dismiss. The long-term follow-up under discontinued antihelminthic chemotherapy was uneventful. We are still waiting for the genotype results. Cyst hydatid should be considered in the differential diagnosis of medullary compression. Bone hydatidosis represent 2% of echinococcosis location. The epidural location is even rarer. Surgical excision is the reference treatment. Chemotherapy is an adjuvant treatment to prevent recurrence. The particularity of this observation is the genotype findings of a primary epidural localisation.

Keywords: Epidural hydatidosis, Spine, Genotype

EP-0504 [Spine and Peripheral Nerve » Infection]**Spinal Hydatid Disease: A Survey Study from Tunisia**

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Hydatid disease is a rare but serious condition affecting the bones in 0.5-2 % of cases of which spine is involved in approximately 45 % of cases. This survey study reviews six reports of spinal hydatid disease treated during the last three decades. Only one patient had also pulmonary infestation. The presenting symptoms were mostly typical and it was interesting that two patients were misdiagnosed before surgery suggesting that new imaging techniques such as computed tomography and magnetic resonance imaging are the procedures of choice for this disease. The cysts affecting the spine were commonly in the thoracic region and all patients had intraspinal extradural hydatid cysts associated with vertebral involvement. Posterior approach with decompression of the spine and removal of the hydatid cysts was performed in four patients and the two others needed combined anterior and posterior approaches. All patients received peri and post-operative Albendazole drug treatment. There was no mortality related to surgery. Recurrence of the disease occurred in five cases of whom three underwent second surgery. Most patients with neurologic deficit improved after first or second surgery compared to other reinterventions. There was marked improvement and no recurrences after combined approach. This study indicates that hydatid disease should be considered in the differential of skeletal cystic lesions. Early surgical decompression aiming for the complete cysts and involved bone removal in association with Albendazole therapy is the treatment of choice. Recurrence is common and if neurologic deterioration occurs reintervention is necessary.

Keywords: Spine, Hydatid disease, Surgery

EP-0505 [Spine and Peripheral Nerve » Infection]

Spinal Schistosomiasis? Medical or Surgical Treatment

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Background: Spinal schistosomiasis, an unusual form of schistosomiasis, this condition affect young individuals, producing clinical features consisting of low backache, lower extremities weakness, numbness, urinary incontinence and features of cauda equina lesion of recent onset.

Method: The study was conducted in the period from 1995 - 2009. All patients with diagnosis of spinal space occupying lesions whose histopathology revealed spinal schistosomiasis were included.

Results: Ten patients satisfied the study criteria. Age range was 6- 42years, mean age was 19.7 years. nine of the ten patients were males. seven were students the rest 3 have other jobs.50% were from endemic area. Clinical picture was. Backache, lower extremities hypohesia, weakness and urine incontinence. Duration ranged from two weeks to two months. Three patients were diagnosed by MRI which showed D 12 to L1 or L2 spinal cord swelling with hyper intense patches in T2 images, the remaining two patients were diagnosed by CT myelogram which showed D12 to L1 or L2 spinal cord intramedullary swelling. Nine patients were treated by D11 to L1 Laminectomy and spinal cord biopsy. one patient was treated by antibilharzial drugs. In surgically treated patients histopathology was schistosomal ovae surrounded by inflammatory cells and edema. All patient received Praziquantel and corticosteroids and all showed improvement.

Conclusion: Spinal schistosomiasis has characteristic features.

This condition produce severe neurological disability in young individuals. We advise medical treatment trial if failed then surgical decompression and biopsy to confirm the condition followed by administration of Praziquantel and Corticosteroids.

Keywords: Spinal schistosomiasis, Praziquantel, Spinal biopsy

EP-0506 [Spine and Peripheral Nerve » Infection]

Isolated Thoracic Vertebral Tuberculous Abscess Mimicking a Mass Lesion

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We would like to emphasize the importance of imaging and close follow-up to establish an accurate diagnosis and treatment in the management of the thoracic spinal lesions. A 56-year-old woman with severe back pain that worsened in the past month was referred to our institution with the pre-diagnosis of thoracic 10 and 11 spinal tumor. Her Magnetic resonance(MR) imaging study was not descriptive of a tumor or inflammation. Erythrocyte sedimentation rate(ESR) and C-reactive protein (CRP) were 49 mm/h and 9 mg/dL, respectively. Tuberculin skin test was negative. New thoracic spinal column MR imaging study with contrast was more susceptible of spondylitis. Empirical antibiotic treatment was set and hyperbaric oxygen (HBO) therapy was started while we were preparing for a percutaneous biopsy. after a week, weakness at left leg started. MR images discerned spinal cord compression on the left side. We surgically decompressed spinal cord and nerve roots. ASIA score improved to D immediately after surgery. Histopathological diagnosis was caveating granulomatous inflammation of the spine. Tests confirmed the diagnosis and specific treatment for tuberculosis was started (Isoniazid, rifampin, pyrazinamide, ethambutol-HRZE). Her follow-up MR images showed regression. VAS score progressed from 9 to 0. Her neurological deficit fully recovered, but a prolonged antituberculous chemotherapy up to 9-12 months was decided. Delays in diagnosis can lead to irreversible neurological deficits, so expedient identification of lesions that impend the risk for epidural extension is imperative. HBO alone without appropriate antibiotics may not be efficient in spinal tuberculosis.

Keywords: Spinal abscess, Spinal tuberculosis, Decompression, Hyperbaric oxygen therapy, Extension into canal

EP-0507 [Spine and Peripheral Nerve » Infection]

Tuberculosis of Spine: An Antiquated Disease with Modern Techniques of Management

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Background: Tuberculosis is one of the oldest disease known to modern world. Its prevalence is increasing secondary to the high burden of HIV disease within the South African setting.

Method: In Helen Joseph Hospital there were 3497 reported cases of Pulmonary Tuberculosis during the last 2 years (2015-2016). These included 29 case spinal Tuberculosis. Out of these 13 patients

presented with neurology and deformity of the lumbar spine in addition ten of these patients were HIV positive as well. All these patients underwent surgery, with 2 patients having precautious posterior spinal fusion, 2 Patients having open Posterior spinal fusion, 3 having spinal biopsies, 3 open thoracotomies and 3 underwent thoracoscopic corpectomy and anterior spinal fusion.

Results: All patient who underwent surgery were started on anti-tuberculosis drugs. The neurology was graded according to Frankel grading system. Seven Patient were classified as Frankel grade B, one patient Frankel grade A, 5 patients were Frankel C. They were followed up (and some continue to follow-up) at 6 monthly intervals for 2 years. All included patients had improved by one or two Frankel grades following the operation and anti-tuberculosis treatment.

Conclusion: The outcome of is generally good, with about 85-95% of patients showing improvement with deformity and neurological deficit. In patient with neurological deficit, good prognostic factors include young age, incomplete paralysis, performance of good surgical decompression and stabilization.

Keywords: Tuberculosis spine, Thoracoscopic decompression, Open thracotomy

EP-0508 [Spine and Peripheral Nerve » Infection]

Evaluation of Efficacy of Collagen Material Containing Double-Release Gentamicin Sponge in Preventing Postoperative Spinal Infection

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Background: We studied that collagen material containing double-release gentamicin sponge for preventing of experimental postoperative spinal infection animal model.

Method: A total of 28 adult female rats were used, in 4 groups each having 7 rats. Group 1: Only cutaneous-subcutaneous, fascia opened, muscles stripped, Group 2: Laminectomy of 2 levels + sterile normal saline, Group 3: Laminectomy of 2 levels + Staphylococcus aureus (106 CFU/10 ult), Group 4: Laminectomy of 2 levels + Staphylococcus aureus (106 CFU/10 ult) + collagen material containing double-release gentamicin sponge. With light microscope, epidural fibrosis, inflammatory cell infiltration and fibroblast density of sections were evaluated and graded.

Results: The group 2 had higher epidural fibrosis, fibroblast cell density and inflammatory cell density than those of the group 1. The group 3 had higher epidural fibrosis, fibroblast cell density and inflammatory cell density than those of group 1. The group 1 had lower epidural fibrosis, fibroblast cell density and inflammatory cell density than those of group 4. The inflammatory cell density was higher in the group 3 than that of group 2. The epidural fibrosis and inflammatory cell density were lower in the group 4 than those of group 2. The group 4 had lower epidural fibrosis, fibroblast cell density and inflammatory cell density than those of group 3.

Conclusion: We therefore consider that the material used for this study could be used for prophylaxis to prevent epidural fibrosis and infection in spinal surgery.

Keywords: Gentamicin, Containing collagen, Spinal infection, Epidural fibrosis

EP-0509 [Spine and Peripheral Nerve » Infection]

360 Degree Fixation of Spinal TB Through Posterior Approach Alone: A Technical Note

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Background: Pott's disease is the most serious form of bone TB. Thoracic and lumbar spines are commonly affected. About 10-40% of patients with spinal tuberculosis may have neurological deficit. Urgent measures are needed to halt progression of disease and deformity, especially to prevent and overcome paraplegia. Surgical decompression of the cord and instrumentation is needed in many cases besides chemotherapy. Although the amount of debridement and bony fusion is optimal when the anterior approach is used but the procedure is very time consuming and technically difficult, specially in compromised patients and morbidity is more. Posterior approach alone is enough for achieving adequate debridement, decompression, reduction, fusion reconstruction of the body and maintaining sagittal alignment in TB spine cases. The technical details will be discussed.

Method: 54 patients were enrolled in this study. Male:female ratio were 5: 2. commonly affected area was dorsolumbar junction. Only posterior approach was used as surgical procedure along with anti-TB drugs. Decompression was achieved through standard transpedicular approach, drainage of pus and debridement of granulation tissues. Bony defect was reconstructed with titanium cage filled with laminectomy bones. Fixation was done with pedicle screw and rod.

Results: Result was excellent. Motor improvement was dramatic in majority of cases. even in some cases patient with grade 0 motor activity could walk independently several months after surgery.

Conclusion: With the improvement of surgical techniques and advent of newer implants and expandable cages, 360 degree fixation can be done safely with posterior approach alone.

Keywords: Pott's disease, Dorsolumbar junction, Decompression, Pus

EP-0510 [Spine and Peripheral Nerve » Infection]

Intramedullary Abscesses. About a Case

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Intramedullary abscess is a rare entity and sporadic cases have been reported. Of these, 30% are children. The medullary abscess may be secondary to penetrating trauma, cutaneous infection on dysraphism or arterial septic embolism. Medullary meningeal infection would be unlikely. The organisms responsible are in order

of frequency: staphylococcus in 23% of cases, streptococcus in 17% of cases, then Gram-negative bacilli. Clinically, the medullary abscess can occur in three forms: acute in the appearance of transverse myelitis; Subacute; Chronic symptoms that develop over a period of more than 6 weeks. The biological signs are inconstant and non-specific and CSF culture is often negative. The scanner can show the lesion. The examination of choice is the MRI which shows the intramedullary seat of the lesion. Treatment consists of surgical drainage of the abscess after laminectomy and myelotomy, combined with broad spectrum antibiotic therapy, targeted antibiotic therapy after identification of the germ. The duration of treatment should be at least 6 weeks. Corticosteroids can be used pre- and postoperatively to reduce the edema accompanying the abscess, but without demonstrated efficacy. We present the case of a 10-year-old child with an abscess of the medullary cone revealed by a progressive paraplegia diagnosed by MRI and whose germ has not been identified. The evolution after surgery and broad spectrum antibiotherapy was satisfactory.

Keywords: Intramedullary, Abscesses, Staphylococcus, Drainage, Antibiotic, Paraplegia

EP-0511 [Spine and Peripheral Nerve » Infection]

Management of Spinal Extradural Abscesses: Results of Two Centers

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Background: Spinal extradural abscesses (SEDAs) are serious entities which have serious complications and poor prognosis. Spinal abscesses (SAs) generally occur in extradural region. The incidence estimated to be 0.37%. In this study, the surgical outcomes of 17 consecutive patients have been evaluated.

Method: Medical records of 20 SA cases which underwent surgery in Bezmialem Vakif University Hospital and Bakirkoy Ruh ve Sinir Hastaliklari Hospital, between 2012 and 2016 were retrospectively reviewed. All SEDA cases were selected as the core sample used for this study. Patients' demographics, compliants, prodrome, location, causative pathogen, surgical outcomes, and complications were investigated. Seventeen cases of SEDAs were surgically treated.

Results: Nine patients were female and eight were male. The mean age was 41.7±22.0(2-75) years. The most common complaint was local pain (88.2%) [n=15]. The mean prodrome was 12.6±12.4(0.5-52) weeks. The locations of SEDA were lumbar in 6, thoracic in 5 and cervical in 5 patients. All patients underwent decompression and evacuation of the abscess and eight patients underwent stabilization (4 posterior, 4 anterior). The causative pathogens were Tbc(n=9), MSSA (n=3), E.coli (n=1), Pseudomonas (n=1) and Brucella (n=1). Neurological outcome improved in 11 patients (64.7%) at their last follow-up after 30.6±20.6 (3-61) months of average. Short prodromal period (≤ 2 months) was the single factor associated with favorable outcome (OR=0.04, P=0.017). Two patients had seroma leak from the wound and were treated with antibiotics. One patient deceased after sepsis at postop second weeks.

Conclusion: The management of SEDAs is variable according to the patients' neurologic deficits, general status and the suspected pathogen diagnosis and urgent surgical treatment are important for good prognosis. Early diagnosis and treatment are important for good outcomes.

Keywords: Brucella, MSSA, Spinal extradural abscess, Tuberculosis

EP-0512 [Spine and Peripheral Nerve » Infection]

The Role of Percutaneous Surgery in the Treatment of Pyogenic Spinal Infections

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Treatment of pyogenic spinal infections is still discussed. Six patients with bacterial spondylodiscitis were treated. All patients presented with pain, without neurological deficit. C-reactive protein and complete blood cell count was analyzed in all cases. MR imaging and CT scans were obtained in all cases. We used percutaneous method of treatment of affected intervertebral disc. Methods included percutaneous aspiration of purulent exudate and introduction into the cavity of the disc antiseptic solutions under the control of the C-arm. Postoperatively, patients received antibiotic therapy for 6 weeks. Antibiotics are prescribed based on the results of bacteriological test exudate. We did not use this technique in cases outside the disc infection (epidural abscess, intramuscular abscesses). In all cases we received regression of clinical and radiological signs of spondylodiscitis. The results of bacteriological examination of exudate, allow for selective antimicrobial therapy. Puncture treatment of purulent focus in the early stages to prevent further spread of infection.

Keywords: Percutaneous, Spondylodiscitis, Spinal

EP-0513 [Spine and Peripheral Nerve » Infection]

Childhood Granulomatous Spinal Infections and Their Surgical Treatment: Report of 4 Cases

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The most well-known of the infectious ones are tuberculosis and Brucella. This report presents three tuberculosis cases and one Brucella case that are localized on the spine at childhood, since they are rare cases. Four children, 3 with tuberculosis, and 1 with brucellosis were included in the study. The patients were examined in terms of age, complaint, neurologic examination, localization, surgical intervention and complications.

Case 1: 2-year old female underwent operation twice at a different institution due to the mass that puts pressure on the canal at T2-3-4. The diagnosis was Pott abscess, TBC osteomyelitis. Paraparesis (At 2/5 muscle strength) MRI revealed T-34 total laminectomy, kyphosis and pressure on the canal. C7-T1-T5-6-7 transpedicular screw stabilization was performed. Treatment for TBC continued.

Case 2: 6-year old male. Brucellosis was identified during examinations and treatment started. Right-oriented deviation at the

neck and movement limitation. C2 dense fracture, C1-2 dislocation was observed in cervical MRI. Posterior C1-2 fusion was performed. Treatment for Brucellosis continued.

Case 3: 14-year old male. The legs started losing strength, after doing a tumble. Paraparesis (At 1/5 muscle strength). T2-3 anterior dislocation was identified in thoracic MRI. T2 total laminectomy + C7-T1-T3-4-5 transpedicular screw stabilization was performed. Pathology and microbiology indicated tuberculosis. Antitbc treatment started.

Case 4: 16-year old male. Treated for TBC since 6 months. Leg weakness started within the last 15 days. Cervical MRI: Mass that applies pressure to the cord at C6 level. C6 laminectomy + abscess excision on the intradural extramedullary capsule were performed. Treatment for TBC continued.

The patients' back, lower back and neck pains have to be taken seriously in terms of risk factors for early diagnosis in regions where the diseases are endemic, and the children with these complaints absolutely have to be assessed in cooperation with pediatric infection and neurosurgery clinics.

Keywords: Children, Tuberculosis, Brucellosis, Spinal column, Surgical treatment

EP-0514 [Spine and Peripheral Nerve » Infection]

Infected Paravertebral Hydatid Cyst: An Uncommon Cause of Paralytic Sciatica

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The sciatic nerve can be compressed by variety of causes, while intervertebral disc herniation is the most common cause of sciatica; other documented causes include infection, neoplasm, degenerative disease and congenital anomalies. We present an exceptional case of sciatic nerve compression by a paravertebral infected hydatid cyst. A 46-year old female presented with lumbar pain radiating to the right leg and difficulty in walking. Her past history included Diabetes Mellitus. Six months prior to admission, she progressively developed pain in the right side of the lower back. Three months later she developed right sciatica treated conservatively. CT scan of the lumbar spine was unremarkable. Three weeks prior to admission she received Oxacillin for skin infection. Two weeks later she developed paralytic sciatica. MRI imaging revealed multicystic masses in the Psoas and paravertebral muscles. The later extended to the right L4L5 neural foramina. The presumptive diagnosis was an abscess. The patient was treated surgically and the histopathological exam confirmed the diagnosis of infected hydatid cyst. The microbiological cultures of blood and pus yielded staphylococcus Aureus. Her neurological deficit partially improved after surgery. The patient received Oxacillin and Albendazole. The unique clinical presentation of our patient, mainly with sciatica and low back pain, resulted from the rarity of the primary of paravertebral hydatid cyst and its exceptional secondary infection. The paravertebral hydatid cyst should be taken into consideration in the diagnosis of low back pain and sciatica especially in endemic countries.

Keywords: Hydatid cyst, Infection, Sciatica, Surgery

EP-0515 [Spine and Peripheral Nerve » Infection]

Concomitant Tuberculous and Pyogenic Spondylodiscitis

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A series of 12 cases of concomitant pyogenic and tuberculous spondylodiscitis proven by features of tuberculosis on histopathology, tuberculous culture and pyogenic bacterial culture was studied. Mean follow up varied from 16 months to 28 months. Need for antibiotics and anti tuberculous drugs and surgical intervention were studied. The duration of drug therapy, need for surgical intervention and biochemical parameters were studied. This is to indicate the importance of suspicion of concomitant presentations of pyogenic and tubercular infections due to poor immunity and antibiotic resistance in non HIV patients.

Keywords: Concomitant spine infections, Antibiotic resistance, Surgical intervention spine

EP-0516 [Spine and Peripheral Nerve » Infection]

The Role of Minimally Invasive Percutaneous Posterior Titanium Screw Fixation for the Treatment of Thoracolumbar Spontaneous Pyogenic Spondylodiscitis

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Background: Posterior titanium screw fixation without formal debridement of the infected tissue and anterior column reconstruction for the treatment of PSD is still controversial. The aim of this study is to analyze the safety and effectiveness of posterior pedicle screw fixation for treatment of pyogenic spondylodiscitis (PSD) without formal debridement of the infected tissue.

Method: From March 2011 to June 2016, 10 patients with pyogenic spondylodiscitis underwent minimally invasive percutaneous posterior titanium fixation with or without decompression, according to their neurological deficit. The outcome was assessed using the visual analogue scale (VAS) for pain and the Frankel grading system for neurological status. Normalization both of C-reactive protein (CRP) and erythrocyte sedimentation rate was adopted as criterion for discontinuation of antibiotic therapy and infection healing. Segmental instability and fusion were also analyzed.

Results: At the mean follow-up time of 36 months (range, 12-42 months), resolution of spinal infection was achieved in all patients. Follow-up computed tomography scan at 12 months after surgery revealed solid fusion in all patients. The VAS before surgery was 9 ± 1.45 and at the final follow-up, it improved to 1.70 ± 1.03 , which was statistically significant ($p < 0.05$). Nine patients had neurological impairment at the final follow-up documented with the Frankel grading system.

Conclusion: Posterior screw fixation with titanium instrumentation was safe and effective in terms of stability and restoration of neurological impairment. Fixation also rapidly reduced back pain.

Keywords: Infection, Posterior surgery, Minimal invasive surgery

EP-0517 [Spine and Peripheral Nerve » Infection] Surgical Management of Postoperative Discitis with Transpedicle Screw Fixation: An Experience of 18 Cases

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Aim: To analyze the outcome of transpedicle screw fixation in postoperative discitis.

Method: This observational retrospective study was conducted from March 2015 to June 2016. The indications for surgery (transpedicle screw fixation) were failed medical management. The patient's visual analog scale (VAS) score was used, to evaluate clinical outcome, at 5 days and 1 month postoperatively. ESR and CRP were also measured pre-operatively and post-operatively.

Results: Out of 18 patients, 13 were male and 5 were female, with age range from 28-46 years (mean = 36.5 ± 6.26 years). Seventeen (95%) of the 18 patients had low back pain relieved significantly after operation. The preoperative VAS score for low back pain was 8.72 ± 0.89 , while it was 4.22 ± 1.26 and 1.44 ± 0.98 at 5 days and 1 month postoperatively respectively (statistically significant, p value <0.05). Sixteen (89%) patients were nonambulatory at presentation. At final follow-up, 14 of 16 patients were independently ambulatory. One patient develops vertebral osteomyelitis after surgery.

Conclusion: Transpedicle screw fixation is an effective and safe procedure in postoperative discitis, refractory to medical management.

Keywords: Postoperative discitis, Transpedicle screw fixation, Outcome

EP-0518 [Spine and Peripheral Nerve » Infection] Altern Hemilaminectomy for Spinal Epidural Abscess Drainage

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The spinal epidural abscess (SEA) is a suppurative process confined to the epidural space. SEA affects patients of all ages, though the majority is between 30 years and 60 years old, with a predominance of males. The most common organism isolated is *Staphylococcus aureus* (60%-90%), although Gram-negative bacteria are more common in intravenous drug users. History: 61 year old male with diabetes mellitus type 2, with no adequate glycemic control, presents with 2 week manifestation of back pain and lower extremities paralysis & paresthesias. He refers fall from his own height 4 weeks ago.

Physical exam: bilateral paraplegia (0/5) with absent deep tendon reflexes and bilateral Babinski negative, and had loss all types of sensitivity from T12 level. There is absent perineal sensation. Weak contracture of the anal sphincter noted, but no bulbocavernosus reflex could be elicited.

MRI: T2 weighted spine MRI was performed, we found and hyperintense epidural lesion in T6-T9.

Technique: altern hemilaminectomy to maintain the stability of the spine, in the T6 left hemilaminectomy, T7 right hemilaminectomy, T8 left hemilaminectomy, and T9 right hemilaminectomy.

The cultures were positive to *Staphylococcus aureus*. The patient was discharged 3 days after procedure with no wound complications, and finished his antibiotic treatment ambulatory. At follow up 1 month after the procedure he presented with discrete gain of the lower extremities motor function (2/5), no gain in sensibility.

Keywords: Altern, Hemilaminectomy, Spinal, Abscess

EP-0519 [Spine and Peripheral Nerve » Infection] Noncontiguous Multilevel Lesions in Spinal Tuberculosis and Their Management

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Background: Although, accounting for just 1-2% of total tuberculosis cases, spinal tuberculosis (sTB) is still a significant health issue in developing countries. Prolonged course of treatment, compliance issues and emergence of drug resistance are some of the factors responsible for this. We present our experience of managing multilevel noncontiguous sTB.

Method: Patients of sTB who had significant destructive changes at 2 or more noncontiguous levels were treated surgically between 2012 to 2017 in our institute. Their clinical presentation, radiology, operative and post-operative details and treatment decision making has been described.

Results: Total 3 patients (2 male, 1 female) hailing from poor socio-economic status presented with pain, fever, weight loss and paraparesis. On imaging, Patient 1 had cervico-dorsal junction and lower dorsal, patient 2 had cervicodorsal and lumbar and patient 3 had dorsal and lumbar disease. All 3 patients underwent decompression and fusion for both levels in single sitting using anterior and/or posterior approaches as both levels had clinical and radiologically unstable disease. No intra-operative complications were noted and blood loss was also minimal. Post-operative course was uneventful; imaging showed good fusion and patients are doing well in follow up.

Conclusion: In cases of sTB presenting with noncontiguous lesions at two levels which require surgical treatment for both the levels, with experience, both can be done in the same sitting for better results and early recovery. This presentation is to highlight this rare presentation and to motivate young neurosurgeons for attempting multiple level fusions for sTB in the same sitting.

Keywords: Pott's spine, Spinal tuberculosis, Skip lesions, Spinal tuberculosis management, Noncontiguous lesions

EP-0520 [Spine and Peripheral Nerve » Infection] Effect of Rifamycin Use on Infection Rates in Microdiscectomy

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Background: Spondylodiscitis following discectomy is a potentially life-threatening complication. Prophylactic use of antibiotics is crucial in preventing spondylodiscitis. The present study aims to

evaluate the effectiveness of prophylactic antibiotherapy in patients undergoing microdiscectomy.

Method: A total of 241 patients who underwent microdiscectomy at our clinic between September 2011 and October 2015 received intravenous (i.v.) cefazolin or ciprofloxacin during induction of anesthesia as a standard of care and rifamycin was administered intraoperatively into the disc space. Antimicrobial prophylaxis was continued with peroral cefuroxime and ciprofloxacin in the postoperative period between days 1 and 7. All patients were scheduled for clinical follow-up visits at one, three, and six months, and one year after surgery. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) values were obtained in patients with the symptoms of spondylodiscitis and the patients with clinically significant findings underwent contrast-enhanced spinal magnetic resonance imaging (MRI).

Results: Only one patient developed spondylodiscitis. The rate of spondylodiscitis was 0.3% in the present series of patients. Treatment of spondylodiscitis was more costly and required further use of antibiotics.

Conclusion: Our study results suggest that intraoperative rifamycin administration and postoperative use of first generation peroral antibiotics are effective in the prevention of spondylodiscitis, obviating the need for more expensive therapies.

Keywords: Microdiscectomy, Complication, Spondylodiscitis, Prophylactic antibiotherapy, Rifamycin

EP-0521 [Spine and Peripheral Nerve » Infection]

Surgical Management of Pyogenic Spondylodiscitis: A Review of 14 Consecutive Patients

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Background: Spondylodiscitis is a rare but serious and destructive disease with high mortality and morbidity rates. Better understanding of the condition and new imaging techniques have allowed for an early diagnosis resulting in a better outcome but its surgical management is still an infrequently used modality of treatment.

Method: Between January 2005 and December 2015, 14 patients suffering from pyogenic spondylodiscitis underwent surgical debridement and reconstruction in our institution. Their medical records were reviewed in order to evaluate the different surgical approaches dealing with this condition as well as the complications associated with the disease itself and with the different lines of treatment undertaken.

Results: Pyogenic spondylodiscitis represented 0.25% of spinal hospitalization in our department during that period. Middle aged males were the most concerned with an average 19 days diagnosis delay. Thoracic spine was the most frequent location (53%) and *Staphylococcus aureus* the most common pathogen (64%). All patients in this series underwent surgical debridement followed by antibiotic therapy for 12 weeks. Mean period of follow-up was 42 months. Healing of the inflammation was the rule for 13 patients and 1 patient died postoperatively due to septicemia. From the 13 patients with neurological deficit, 9 completely recovered. We experienced no metal failure.

Conclusion: Spondylodiscitis should be considered in patients with clinical and laboratory inflammation signs especially those who underwent recent spine surgery. Timely diagnosis and appropriate management are keys and could result in total recovery in most of the cases.

Keywords: Spine, Infection, Spondylodiscitis, Treatment

EP-0522 [Spine and Peripheral Nerve » Infection]

Spinal Compression Revealing Hydatid Cyst

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Hydatid disease is a common cause of spinal cord compression in its endemic areas. Its diagnosis remains obscure until symptoms resulting from complications due to root and cord compression appear. Preoperative diagnosis is essential because the rupture and dissemination of cyst may result in anaphylaxis and recurrence. Hydatid disease of spine, also called spinal cord hydatidosis is a rare disease with an incidence of less than 1%. Cysts are usually multiple and mostly extradurally located. The clinical symptoms vary according to which part of the spine cord has been involved. Hydatid disease of the spine is caused by the parasite *Echinococcus granulosus*, a helminth belonging to the cestode group. Hydatidosis of the bone occurs in 0.5-3% of all the cases: the vertebral column is involved in 50% of these (Ikhlass et al, 2015). The disease usually spreads to the spine by direct extension from pulmonary or abdominal infestation and less often begins primarily in the vertebral body. Primary extradural hydatid disease without any systemic foci is extremely rare. We report of one observation of extradural hydatid cyst of the thoracic spine in an 11 years old boy child, who was operated at our Neurosurgery Service at the University Hospital Mohammed VI of Marrakech.

Keywords: Echinococcosis, Hydatidosis, Spinal echinococcosis, Spinal compression

EP-0523 [Spine and Peripheral Nerve » Deformity]

Grisel's Syndrome

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Grisel's syndrome is non-traumatic subluxation of the atlantoaxial joint. This syndrome usually occur with Ear Nose Throat (ENT) pathologies that is infections, inflammatory processes and after the ENT surgery. Patients usually present with complaints of neck pain and limitation of movement in the neck. 6 years old boy was referred to our department for torticollis and rotation head to left side. In his history, he had operated a month ago for adenoidectomy. It had any peroperative complication. Postoperative first day morning, patient waked up torticollis and head rotation. Medical treatment was recommended for these symptoms After 3 weeks, radiologic examination performed, and he diagnosed with Type 1 atlantoaxial rotatory subluxation We recommade rigid cervical collar, anti-

inflammatory and muscle relaxant drugs for 2 weeks. We have check every week for neurological exam. After three weeks later, we have check with radiology. After detected the patient recovered in neurologically and radiologically, the rigid collar use was stopped. Grisel's syndrome is common in the age range of 3-12 years. Usually after previous ENT surgery or posterior pharynx infection. The most accepted hypothesis in the etiology is the separation of the joint capsule from the bone for inflammatory reasons. Field atlantoaxial subluxations were classified in 4 groups. Operative treatment recommend only for type 4. As a result, children with neck pain with torticollis, firstly the story of the ENT surgery must be questioned. According to clinical examination and radiological symptoms, the form of conservative or operative treatment should be determined.

Keywords: Grisel's sendrome, Servikal subluxation, Adenoidektomi

EP-0524 [Spine and Peripheral Nerve » Deformity]

Upper Thoracic PJK/PJF is Typically Due to Spondylolisthesis whereas Lower Thoracic PJK/PJF is more Often due to Vertebral Fractures

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Background: Proximal junctional kyphosis (PJK) is common after long thoracolumbar fusions for adult spinal deformity (ASD). Our aim was to compare incidence of radiographic PJK, revision rates for PJK and mechanisms of proximal junctional failure (PJF) resulting in PJK between ASD patients who underwent thoracolumbar fusions from the pelvis to the upper or lower thoracic spine.

Method: Consecutive adults who underwent thoracolumbar fusions for ASD (2003-2011) were reviewed. Perioperative spinal deformity parameters were assessed. Rates of radiographic PJK, revision surgery for PJK and mechanical failures were assessed and compared between patients whose UIV ended in the upper thoracic spine and lower thoracic spine.

Results: 340 patients met inclusion criteria. Average radiographic follow-up was 48.56 months. Patients with an UT-UIV were more commonly female, had a significantly lower final postop SVA, greater thoracic kyphosis, lumbar and thoracic Cobb and coronal imbalance pre- and postoperatively, as well as significantly less PJA progression postop compared to patients with an LT-UIV. There were no differences between the groups in regards to PJK incidence and PJK revision rates. Patients with UT-UIV had significantly fewer fractures (25 vs 41.4%) and significantly more spondylolisthesis (10.4 vs 3.3%) than patients with LT-UIV ($p < 0.05$).

Conclusion: Radiographic PJK after long thoracolumbar fusions for ASD is common in this cohort. Rates of radiographic PJK and revisions for PJF do not differ based on UIV level. PJK is more commonly caused by spondylolisthesis in UT fusions and by

vertebral body fractures in LT fusions.

Keywords: Adult spine deformity, Proximal junctional kyphosis, Proximal junctional failure

EP-0525 [Spine and Peripheral Nerve » Deformity]

The Role of Fresh Cadaveric Studies Prior to Dens Resection via Extreme Lateral -Transatlans Approach

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Aim: To improve patient outcome after dens resection via extreme lateral -transatlans approach first described by Türe U.

Method: Twenty inductive fresh cadaveric studies were performed prior to a planned dens resection via extreme lateral -transatlans approach.

Results: Dissection of the craniovertebral junction, and the corresponding vertebral artery segments using subperiosteal technique is mostly facilitated by 'everyday' inductive fresh cadaveric practice. Using this thechnique, a special surgical case with Down syndrome is also presented.

Conclusion: Surgical dissection of the craniovertebral -junction in cadaveric specimens, and in a real patient show clear similarities (the basic difference found was the pathology itself). This similarity allows neurosurgeons to effectively master the surgical steps prior to performing delicate and seldom maneuvers such as dens resection via extreme lateral -transatlans approach.

Keywords: Cadaveric, Lateral - transatlans approach, Dens resection

EP-0526 [Spine and Peripheral Nerve » Deformity]

Radicular Pain Resulting from Facet Malposition After Stabilization Surgery

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Posterior lumbar transpedicular stabilization surgery is a surgical procedure that has been described for a long time and the complications are clearly described. We will report here an overlooked but usual complication as a cause of radicular pain after fusion surgery. Between September 2015 and January 2017, a total of 9 patients who underwent posterior lumbar transpedicular stabilization surgery, suffered severe radicular pain and limb weakness unless any evidence of screw malposition or rezidual disc herniation after surgery. Lumbar CT scan revealed foraminal stenosis and lateral recess stenosis due to malposition of medial facet joint parts on the effected sides. Patients underwent revision surgery and removal of medial parts of facet joints and extended foraminotomy were performed. Severe compression on the traversing nerve root by medial facet part observed during surgery. Pain resolved immediately after surgery in five patients and in a week with analgesic treatment in four patients. We concluded that the reason of the facet joint compression is improper alignment of the screws on vertical plain and excessive pover usage for replacing

the rod. Screw trajectory should be calculated carefully and removal of medial part of facet joint should be performed in case of improper alignment of screws in vertical plain to avoid this complication.

Keywords: Radicular, Pain, Fusion, Alignment, Facet

EP-0527 [Spine and Peripheral Nerve » Deformity]

Do Perioperative Spinal Deformity Parameters and Junctional Mechanical Failures Predict the Development of Proximal Junctional Kyphosis after Long Thoracolumbar Fusions for Adult Spinal Deformity?

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Background: Proximal junctional kyphosis (PJK) is the most common complication following adult spinal deformity (ASD) surgery, although unique demographic and perioperative radiographic spinal deformity parameters for patients who develop PJK and those who do not after ASD operation are not well defined. Our aim was to assess unique demographic and perioperative radiographic spinal deformity parameters associated with PJK after ASD operation.

Method: A retrospective study of consecutive patients who underwent thoracolumbar fusions for ASD between 2003 and 2011 at a single institution was performed. A minimum of 2 year follow-up was conducted. Radiographic analysis included: pre- and postoperative spinal deformity parameters and mechanical failures at the proximal junction of fusions were assessed. Patients with and without PJK were compared.

Results: 340 patients met inclusion criteria. One-hundred seventy-six patients (51.8%) developed PJK of whom 104 (59%) had a PJE, 39 had proximal junctional screw pullout (22%) and 18 had spondylolisthesis (10.2%). While only 27% of patients with PJK required revision surgery. Compared to those without PJK, patients who developed PJK were significantly older and had significantly greater thoracic kyphosis, lumbar lordosis and less LL-PI mismatch on the first erect radiographic and at final follow-up. All other pre- and postoperative radiographs were statistically similar between the two groups.

Conclusion: After long fusions for ASD surgery, PJK occurred in more than 50% of patients, of which 27% were revised. Junctional mechanical failures (fracture, screw pullout, spondylolisthesis) often do not warrant revision surgery.

Keywords: Adult spine deformity, Proximal junctional kyphosis, Proximal junctional failure

EP-0528 [Spine and Peripheral Nerve » Deformity]

Os Odontoideum: A Case Report and Review of the Literature

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Os odontoideum or mobile odontoid apophysis is a rare malformation of the cervico-occipital hinge which involves the vital and functional prognosis by the risk of compression of the bulbo-medullary junction. We report the case of a twenty two-year-old patient who suffered cervical trauma at the age of two years, who was diagnosed with recurrent torticollis and subsequently with tetraparesis. Although a symptomatology deficiency is often revealing, the notion of recurrent neck pain (even isolated) must attract attention. The assessment uses dynamic radiographic images, CT and MRI. The etiopathogenesis remains unknown congenital or traumatic. The treatment is surgical in symptomatic patients and relies on arthrodesis and posterior osteosynthesis, while in the asymptomatic subjects a simple monitoring is recommended. Early diagnosis and treatment lead to stabilization and clinical improvement in the majority of cases.

Keywords: Odontoideum, Malformation, Hinge, Spine, Compression

EP-0529 [Spine and Peripheral Nerve » Deformity]

Dynamic Stabilization in Degenerative Spinal Diseases and Clinical Results

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Background: Stabilization is a commonly used treatment modality in spinal diseases. Systems that started with rigid stabilization now leave their place to dynamic systems. The problems seen in the later period in patients treated with rigid stabilization are clearer day by day. In rigid stabilization treated spinal diseases, there is restriction of flexion extension and rotational movements due to this rigidity.. Dynamical stabilization can allow physiological movements of the patient and long term problems can be solved.

Method: Of the patients, 90 were female and 32 were male. The mean age of the patients was 55.1 (27-77). Patients were treated with Peek rod stabilization (semi rigid). Patients with recurrent disc herniation, degenerative spine diseases, spinal stenosis and adjacent segment disease were present in the patients. All patients were examined with CT, dynamic 4-side radiography, and MR as standard.

Results: The mean follow-up period was 28.9 months (16-39). None of the patients had system problems such as instrument fracture, screw pull-out, rod and nut problems since the date of operation. Spondylolisthesis was not seen in any patient. None of the patients had adjacent segment disease.

Conclusion: The short and long term problems experienced in rigid systems have led to dynamic systems due to the more appropriate anatomy and physiology. The dynamic system has emerged as an

alternative to rigid systems. However, perhaps it will be the primary treatment systems in the near future. In our series, no problems have been seen in rigid systems such as adjacent segment disease, instrument problems and psodoarthrosis.

Keywords: Dynamic stabilization, Instrumentation, Peek rod

EP-0530 [Spine and Peripheral Nerve » Deformity]

Is There a Higher Propensity for Proximal Junctional Kyphosis and Revision Surgery in Adult Spinal Deformity Patients with Higher Preop Sagittal Imbalance?

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Aim: To analyze the relationship of preop sagittal imbalance with postop PJK, PJF mechanisms, and revision surgeries in adult spine deformity (ASD) patients.

Method: Consecutive patients, who underwent fusion for ASD at a single institution (2003-11), were analyzed. Patients with age >18 years, instrumentation extending from L1 or above to the pelvis, and a minimum 2 years follow-up were included. The relationship of pre-op sagittal imbalance (SVA<5cm, 5cm<SVA<10 cm, SVA>10cm with other SRS-Schwab sagittal spinopelvic modifiers) with PJK incidence, failure mechanisms (vertebral body fracture, screw-pullout, and spondylolisthesis at UIV) and revision rates were assessed.

Results: Of 340 patients (M: 86, F: 254, avg. age: 63±10yrs), 113 (33.2%) had preop SVA<5cm, 81 (25.8%) had preop SVA of 5-10 cm, 115 (37.2%) had preop SVA>10cm. There were higher PJK incidence (49.6%, 55.6%, 58.3%), higher revision rates (25%, 22.2%, 28.4%), and higher PJF mechanisms in patients with SVA>10cm, yet the differences were not significant (p>0.05 for all). PJK and revision surgery rates did not correlate with other SRS-Schwab modifiers (PT, lumbopelvic mismatch) except for the trend we observed with the preop SVA modifier (p>0.05).

Conclusion: We found a tendency for increased postop PJK and revision rates following long segment surgery in ASD patients with higher preop sagittal imbalance (especially with SVA>10cm) but this was not statistically significant.

Keywords: Adult spine deformity, Proximal junctional kyphosis, Proximal junctional failure, Sagittal vertical axis

EP-0531 [Spine and Peripheral Nerve » Others]

Who Sets Light to the Scientific Path of Spine?: Publication Rates of the Abstracts Presented at the Spine Society of Europe and the North American Spine Society Meetings

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Background: Publication rates of the presented abstracts are the recent point of interest in the literature. Similar studies have been conducted for different international scientific spine meetings. However, publication rates of the abstracts presented at EuroSpine and NASS meetings have not been compared, previously. Our aims were to compare the publication rates of the abstracts presented at these two international spine meetings and to find out the specialty with the highest abstract presentation rates and that with the highest publication rates.

Method: We retrieved 2372 abstracts from the corresponding published conference proceedings. The abstract titles and the author names were searched using Pubmed and Google Scholar engines. First, the author specialties and the abstract origins were recorded. Then, the name of publishing journal, time to publication and content changes were also recorded for each published abstract.

Results: Publication rates in the EuroSpine and NASS meetings were 31% and 48%, respectively. Orthopedic surgeons presented 71% of the abstracts at the annual meetings of the EuroSpine and the NASS 2009-2012. However, neurosurgeons had the highest publication rates among all specialties contributed to these spine meetings (48%, p=0.0001).

Conclusion: Publication rate of the abstracts presented at NASS is higher than those at EuroSpine. Even though the orthopedic surgeons are far more ahead in the number of abstract presentations at these two international spine meetings, neurosurgeons have higher success rates in publication of these abstracts (for NASS and altogether). Further studies are necessary to understand underlying factors leading to these differences.

Keywords: Publication, Abstract, Meeting, Journal

EP-0532 [Spine and Peripheral Nerve » Others]

Surgical Treatment of Spinal Plasmacytomas: Experience of Consecutive Twelve Cases

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Background: Multiple myeloma is a progressive uncontrolled growing of plasma tumor cells which has poor prognosis in bone marrow. Plasmacytomas are discrete, solitary masses of neoplastic monoclonal plasma cells in either bone or soft tissue. Spinal plasmacytomas (SPs) are progressive neoplasms which present with progressive weakness. This study presents the surgical outcomes of spinal plasmacytomas.

Method: The patients operated between the years 2008 and 2016, for SPs at neurosurgery department in BRSHH institution. All patients underwent laminectomy before STR/NTR/GTR. All of Patients were received RTP, ChT and stem cell transplantation (expected for one patient who died after 2 months) had been applied.

Results: 12 (4 female, 8 male) patients were operated for SPs. The mean age was 46.6±15(15-76). The most common complaints were local bone pain(100%), followed by extremities' pain(58.3%) and

motor weakness(50%), respectively. The mean clinical course was 1.89(1day-4months) months. Their locations were thoracic (58.3%), lumbar(33.3%) and occipito-cervical (8.4%). Five patients were underwent posterior instrumentation. The mean length hospital stay was 16.4±8.2(7-65)days. Immunohistochemical analysis showed 6cases were stain for lambda and 4cases for kappa, in the remaining 2cases, monoclonality could not be established because most cells did not stain for either kappa or lambda. The mean of follow-up (overall survive) was 66.4±26.3(13-98)months. 5-year overall survival rate was 75%. 1patient was reoperated for SSI, 3patients were died after 2, 36 and 39 months for diffuse multifocal form of multiple myelomas. All of survival patients who experienced motor weakness were improvement.

Conclusion: Stem cell transplantation has good outcomes after surgical resection+RTP+ChT.

Keywords: Plasmacytoma, Stem cell transplantation, Overall survival rate, Mortality

EP-0533 [Spine and Peripheral Nerve » Others]

Surgery for Cranio-Vertebral (CV) Junction Instability and Indications of Vertebral Artery Mobilization: Our Experience

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Background: Cranio vertebral (CV) junction is one of the critical sites for surgery. Its anatomy, physiological aspects and pathological involvement varies in a wide range of margins. Common problems are developmental anomalies, traumatic involvement, inflammatory, infective and neoplastic lesion. instability is the most common pathology. Aim of the presentation is to share our experiences.

Method: We prospectively analyzed 176 cases of Cranio-vertebral (CV) region stabilization surgery in the Department of Neurosurgery Dhaka Medical College Hospital, National Institute of Neurosciences and some other private hospital in Dhaka from 2001 to 2016.

Results: Pathologies were-Atlanto-axial dislocation (AAD)-135 cases, tuberculosis of CV junction 15 cases, 21 cases of Hangman's fracture, C2 bony tumor 03 cases and 02 cases were atlanto-occipital dislocation (AOD). Surgical procedures were done for decompression, reduction, stabilization and fusion. Among the surgical procedures C1-C3 lateral mass screw & rod fixation and fusion in 29 cases. C1-C2 joints jamming & lateral mass screw plate/rod fixation done in 122 cases. Condylar joint fusion and stabilization were done after vertebral artery mobilization in two cases of AOD. Total VA mobilization done in 04 cases. There was no post operative new neuro-deficit except two. Reoperation needed in 12 cases. Mortality was in 05 cases.

Conclusion: Complete pre operative radiological study and selection of proper surgical menu are very important for a successful surgical result. VA mobilization may be needed only in some selective cases.

Keywords: Crania-Vertebral junction, Instability, Vertebral artery mobilisation

EP-0534 [Spine and Peripheral Nerve » Others]

Symptomatic Adjacent Segment Disease (ASD) After Lumbar or Lumbosacral Minimally Invasive Interbody Fusion

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Background: Because of increase in fusion surgery in recent years, ASD become an important topic in spine surgery. The development of motion preservation technologies and minimally invasive interbody fusion theoretically should lead to a decrease in this pathology.

Method: We performed a retrospective cohort study based on medical record review. From 2012 to 2016, 83 cases of minimally invasive interbody fusion were performed by the authors. Clinical ASD was the principal judgment criterion.

Results: Only 41 patients met the recruitment requirements or were able to follow (22 M, 19 F) with an average age of 58 (24-78), Minimum 6 month follow up, (average 23 month, range 39-6). As preliminary results the incidence of ASD, following MI lumbar fusions in our serie was 4,8 % (two patients), one with prior adjacent degenerative disease.

Conclusion: Multiple studies explored the risk factors contributing to ASD; Damage to the posterior ligamentous complex, fusion length, sagittal imbalance, high degree of pelvic incidence, facet injury, and prior adjacent degenerative disease. Although the limitations of relative short follow up, we found a trend toward decreased risk of ASD compared to the published open group. This suggests that MILIF may be associated with decreased long-term morbidity regard ASD compared to the open approach. More Data and longer follow up especially after 5 years are need to evaluate the real incidence of ASD after minimally invasive lumbar interbody fusion in comparison with open approach to confirm these findings.

Keywords: Adjacent segment, Disease, Minimally invasive, Fusion

EP-0535 [Spine and Peripheral Nerve » Others]

Evaluation of Pre- and Postoperative CSF Flow MRI Results of Patients Operated due to Chiari Malformation

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Background: We have tried to prove in this study and preoperative and postoperative CSF flow MRI use is required in selection of patients with Chiari formation for which surgical treatment is planned and in evaluation of such patients' surgical efficiency.

Method: Pre-operation and post-operation foremen magnum CSF flow MRI images of 43 Chiari Malformation Type 1 patients who have undergone surgical treatment between August 2010-December 2015 have been examined.

Results: Foramen magnum decompression (FMD), C1 laminectomy and duraplasty have been applied to all patients.29 were female, 14 were male with a female to male ratio of 2,07:1. The youngest patient was 4 while the oldest was 61 with an average age of 34,1±14,6. The

lowest pre-operation foramen magnum CSF flow MRI values of all patients was 0.2 cm/second and the highest was 1.0 cm/second with an average of 0.6 cm/sec. Normal foramen magnum CSF flow MRI speed values were 1.6 cm/second–6.0 cm/second and flow of all patients have been reduced. Post-operation foramen magnum CSF flow MRI values were minimum 1.0 cm/second–maximum 6.5 cm/second and 3.0 cm/second on average. Post-operation 6th month foramen magnum CSF flow MRI speed value showed a meaningful ($p < 0,05$) when compared to pre-operative period (Wilcoxon test).

Conclusion: FMD and duraplasty are safe and effective surgical methods in Chiari formations with or without syringomyelia. When clinical and radiological patient selection was examined, it was determined that foramen magnum CSF flow MRI diagnosis should be carried out both pre-operative and post-operatively for Chiari 1 malformation and is effective in determining the efficacy of operation after surgery.

Keywords: Chiari malformation, Syringomyelia, Foramen magnum decompression, CSF flow, MRI

EP-0536 [Spine and Peripheral Nerve » Others]

Intradural Cauda Equina Nerve Root Cavernous Haemangioma

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Spinal Cord Intradural Cavernoma is a rare disease. It is a vascular disorder composed of capillary-like vessels without intervening neurons within a spinal lesion. It may only be discovered incidentally or may be diagnosed after a neurologic deficit. Approximately 10% of all intramedullary cavernous malformations are present in the pediatric population. A case of a 13 year old girl admitted with the complaint of back pain and right leg weakness for the last four weeks. Magnetic resonance Imaging revealed an L1 intradural tumor. We have operated the patient under general anesthesia. After opening the dura we have exposed a highly vascular malformation located in the nerve root. Lesion was originating in one nerve root and adherent to others. After meticulous dissection from other nerve roots we have totally removed the tumor. Pathology revealed cavernous angioma inside the nerve root. Lumbar intradural nerve root originated cavernous malformations are very rare lesions. Surgical excision may be necessary in patients. Complete removal should be the aim of the surgeon in these benign tumors. Meticulous microneurosurgical dissection is necessary to save normal nerves in the cauda equina location. Intraoperative ultrasound and neurophysiologic monitoring are very helpful during surgery to preserve neural tissue.

Keywords: Cauda equina, Cavernous hemangioma, Spine, Pediatric

EP-0537 [Spine and Peripheral Nerve » Others]

CT-Assisted Percutaneous Vertebroplasty of Upper Thoracic Spine

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Background: Percutaneous vertebroplasty of thoracic spine with C - arm is an effective and minimally invasive treatment option. If the process is localized from Th1 to Th5, the vertebroplasty is technically difficult at this area especially affected by marked osteoporosis.

Method: There were 35 patients with localization from Th1 to Th5 vertebrae. Of this cohort 21 (60%) patients with spinal compression fracture affected by osteoporosis, 8 (22.8%) patients hemangioma of vertebral body, and 6 (17.1%) patients secondary changes in vertebral body. The localization in Th1 vertebrae was 3 (8.5%), in Th2 vertebrae was 7 (20%), in Th3 vertebrae was 5 (14.3%), in Th4 vertebrae was 9 (25.7%) and in Th5 vertebrae was 11 (31.4%). Male - 15 (42.8%), female - 20 (57.2%). All patients had preoperative pain syndrome without neurologic deficit. Pain severity was assessed using VAS. Average operation time was $43 \pm 3,5$ minutes.

Results: In 3 (14.3%) cases, patients with osteoporosis had cement extravasation under the posterior longitudinal ligament. In this group, the preoperative regression of pain after 1 month up to a level of 2.5 ± 0.5 according to VAS. After 3 months, pain syndrome renewed associated with the progression of osteoporosis. In patients with hemangioma, the pain syndrome regressed in 30 minutes after vertebroplasty. After 3 months, the preoperative pain was not renewed. In patients with the secondary lesion in vertebral body pain after 3 months was detected in 4 (66.7%).

Conclusion: CT-assisted percutaneous vertebroplasty it's effective technique for treatment of upper thoracic spine.

Keywords: Percutaneous vertebroplasty, Osteoporosis, CT-assisted

EP-0538 [Spine and Peripheral Nerve » Others]

Improvement of Chiari Malformation Type 1 with Hydrocephalus After VP Shunt Surgery-A Case Report

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Arnold Chiari malformation 1 is defined as a herniation of the cerebellar tonsils into the foramen magnum of more than 5 mm. Symptoms are most commonly dominated by occipital headache torticollis and sometimes swallowing disorders and difficulty in walking. We report the case of a 17 years old girl was suffering from headache, difficulty in vision, vomiting, neckache, upper limbs pain, abnormal sensation in the whole body specially in both upper limbs and mild general weakness and difficulty in walking. CT scan of brain showed dilatation of ventricles. MRI of cervical spine shows chiari malformation with syringomyelia in cervical and extended into dorsal region. Then VP shunt was done and condition of the patient gradually improved, Now ventricles are normal, syring has disappeared and tonsil of cerebellum remains in normal positions.

Keywords: Chiari malformation, Syringomyelia, Hydrocephalus

EP-0539 [Spine and Peripheral Nerve » Others]

Carbamazepine Related L1-L3 Fracture: Case Report

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About 50 million people suffer from epilepsy. Epilepsy, mostly seen in pediatric and adolescent patients who are high bone growth and mineralization. In 70% of patients we can get under control the seizures with anti-epileptic drugs (AEDs). Fracture risk in epileptic patient is 2 or 6 times higher than normal population, related with AED type, dose, multiple drug use and duration of using AED. AEDs effects bone mineral density with various mechanisms. In our study we present L1-L3 fracture in long time carbamazepine user, without trauma. 38-year-old man suffering from low back pain for two weeks without trauma who used long time 400 mg/day carbamazepine and he uses 800 mg/day for two years. He did not take vitamin D, calcium replacement or use bisphosphonates. He had no neurological deficits. In his lumbar magnetic resonance imaging (MRI) L1 and L3 vertebra corpus fracture was detected. Dual-energy X-ray absorptiometry (DEXA) was shown osteopenia. Complaints of patients was over with analgesic treatment. We usually see lumbar fractures related phenytoin but as in this case we must remember that other AEDs also have increased lumbar disc fracture risk. Epileptic patients must follow up in 6 months periods for risk of bone fracture. DEXA, questioning of eating habits, blood calcium vitamin D, bone metabolism markers in blood and urine follow up are important. Vitamin D and calcium replacement, bisphosphonates use suggest for decreasing the fracture risk in these patients.

Keywords: Carbamazepine, Osteopenia, Lumbar fracture

EP-0540 [Spine and Peripheral Nerve » Others]

Posterior Endoscopic Cervical Discectomy for Cervical Soft Disc

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Background: There are many treatment options for cervical disc disease and according to many surgeons anterior cervical discectomy and fusion (ACDF) is currently the standard treatment for cervical disc disease. For all that cervical keyhole foraminotomy is indicated in case of nerve root compression secondary to posterolateral disc herniation or spondylolitic foraminal stenosis. Depending on developments in endoscopic approaches endoscopic cervical discectomy became an alternative choice of treatment for cervical disc disease.

Method: In this study, medical records were reviewed of 24 patients (14 men, 10 women; mean age 40,2 years) who had single level foraminal soft disc herniation who were operated by posterior endoscopic cervical discectomy (PECD). All patients were discharged the day after the operation and the mean followed up time was 24,7 months. At the last follow-up, we analyzed preoperative and postoperative VAS, PROLO and MacNab scales with the patients' clinical pictures.

Results: Patients' mean preoperative VAS was 8,4 (7-10), PROLO economic scale was 2,5 (2-5). After 1 week of the operation their mean VAS was 2,3 (0-6) and PROLO economic scale was 3,7 e (3-5). At last control inspection of the patients, their mean VAS was 0,91 (0-3), PROLO economic scale was 4,5 (3-5) and MacNab scale was; % 58 perfect, % 29 good, % 8,3 medium, % 4.1 bad.

Conclusion: The PECD is an effective alternative method for unilateral cervical radiculopathy due to soft disc herniations at lateral and foraminal location.

Keywords: Endoscopic, Cervical, Soft disc

EP-0541 [Spine and Peripheral Nerve » Others]

Acquired Chiari Malformation After Lumboperitoneal Shunt: Physiopathology and Therapeutic Options

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Acquired Chiari malformation is a rare complication of lumboperitoneal shunting. Therapeutic modalities are varied and subject to controversy with varying degrees of success. A 35 year-old patient, diagnosed with idiopathic intracranial hypertension, was treated initially with a lumboperitoneal catheter. Six months later, she complains of headaches and problems of balance and ataxia. MRI showed a herniation of the cerebellar tonsils and a disappearance of the cisterna magna. A lumboperitoneal shunt with an adjustable pressure valve was performed. Follow-up at 1 year showed relief of clinical signs and MRI showed resolution of the Chiari malformation. Delayed Chiari malformation after a lumboperitoneal shunt is a rare complication. Clinical and radiological follow up is mandatory in order to propose appropriate treatment and be able to carry out a reversion of this disease.

Keywords: Acquired chiari malformation, Idiopathic intracranial hypertension, Lumboperitoneal shunt

EP-0542 [Spine and Peripheral Nerve » Others]

Treatment and Surgical Outcomes of Cervical Syringomyelia: Retrospective Evaluation of 48 Patients

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Background: Syringomyelia is the condition of accumulation the fluid within the center of the spinal cord or within the extracanalicular area that expands the diameter of it. The current study evaluates the surgical treatment outcome of consecutive 48 cervical syringomyelia patients who undergone surgery at our institution.

Method: Forty-eight (32 women, 16 men) patients were presented with syringomyelia and operated between the years 2004 and 2015. First, the main cause was treated surgically. If syrinx cavity was regressed and complaints were relieved no additional surgical interventional applied. Otherwise, syringomyelia was treated surgically. The mean follow-up period was 109.7±24.8 (18-166) months. The mean age of the patients was 36.8±17.1 (18-64) years.

Results: The most common complaint was hemiparesis (72.1%). The mean prodrome was 8.3 months (15 days-36 months). The causes

of syringomyelia were chiari malformation (29), intramedullary spinal tumors(11), idiopathic(2), traffic accident (2), spondylitis (2), arachnoiditis (1) and meningitis (1). Syrinx locations were in cervical only (41) and cervicodorsal (7). 9-year survival rate was 100%. Morbidity rate for syringomyelia was 47.1%. 9 patients were underwent cyctectomy using T-tube, 6 patients were underwent syringopleural shunt and cystectomy±myelotomy applied in 4 patients. Shunt and T-tubes 9-year revision rate was %59.3.

Conclusion: Treat the main cause of syringomyelia such as resection the tumor or decompression, the cavity of syringomyelia may disappear automatically. Syringomyelia caused as result of ependymomas or spondylosis was regressed after tumor removal and cervical decompression. T-tubes and syringopleural shunt have high revision rate. The clinical recovery in syringomyelia patients is not possible every time.

Keywords: Syringomyelia, Chiari syndrome, Spinal intramedullary tumors, Myelotomy, T-tube, Syringopleural shunt

EP-0543 [Spine and Peripheral Nerve » Others]

Effect of Topical Rifamycin Application on Epidural Fibrosis in Rats

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Background: Rifamycin SV is topically applied to treat superficial and deep wound infections in various surgical interventions. However, there is a lack of data regarding the effect of topical rifamycin SV application on epidural fibrosis formation. This study aimed to investigate the effects of topical rifamycin SV application on epidural fibrosis formation in a rat model.

Method: Twenty Wistar rats were equally and randomly divided into two groups: laminectomy only (control group) and laminectomy and rifamycin SV (treatment group). Laminectomy was performed between L3 and L5 in all rats. Rifamycin SV (1 cc) was topically applied and left on the dura mater. After 4 weeks, the vertebral columns of the rats were removed en bloc between the L1 and L5 levels, and epidural fibrosis and arachnoidal involvement were histopathologically evaluated and graded.

Results: Topical rifamycin SV application had no significantly different effect on epidural fibrosis formation and arachnoidal involvement in the control and treatment groups ($p > 0.05$).

Conclusion: Topical rifamycin SV application for preventing wound infection via a spinal approach can be safely used without aggravating epidural fibrosis.

Keywords: Epidural fibrosis, Laminectomy, Rifamycin

EP-0544 [Spine and Peripheral Nerve » Others]

Spinal Arachnoid Cyst: Lessons Learnt

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Symptomatic spinal arachnoid cysts are rare and are either extradural, intradural or rarely combination of these. The etiology of these lesions is unclear and association with a defect of the dura mater is reported. The causes of this dural defect may be traumatic, postoperative, infectious or congenital. The diagnosis is suspected on use of clinical and radiological tools like MRI, CT myelography or a combination of both. The best treatment option is complete removal of the cyst with dural repair with or without duroplasty. Alternatively, a cyst fenestration or partial excision can be performed with or without combining with cysto-peritoneal shunt. This article provides analytical data of 21 patients (13 males and 8 females) with spinal arachnoid cyst who underwent surgery during 11 year duration from 2002 to 2013 at NIMHANS. 90.47% of the patients had shown improvement at-least 30 months after surgery, with highest success rate was seen among congenital/idiopathic cysts (90.90%). whether they underwent complete cyst excision alone (n=5), complete Cyst Excision with dural repair with or without duroplasty (n=5) or fenestration with Partial Cyst Excision (n=1). The single other patient from this etiology group had deteriorated in his symptoms compared to pre-op status. Most common complication seen was CSF leak from the wound in 28.57% (n=6) of patients. 9.52% (n=2) of the patients had wound infection with similar rate of recurrence of the cyst 9.52% (n=2). Two patients had Pseudo-meningocele at the operative site, managed with Theco-peritoneal shunt in one and re-exploration of the wound in another.

Keywords: Spinal, Arachnoid, Cyst

EP-0545 [Spine and Peripheral Nerve » Others]

Epidural Administration of Steroids in Failed Back Surgery Syndrome on the Spine

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Background: Epidural administration of steroids in failed back surgery syndrome on the spine. Nowadays, pain the back and FBSS take one of the most significant places in medical – social problems. According to different authors, 15% of patients and below face FBSS after being operated for intervertebral hernias.

Method: During first 6 months after surgical treatment in T1, T2 and STIR (TRIM) regime of MRI certificate fibrous and scarring tissue looked the same as moronic changed disc – hypointensive. Those difficulties in MRI interpretation in early postsurgical period appear to be reason to frequent second operations for false recurrence of disk hernias. However, clinical outcomes of similar operations tend to be worse than primary operations.

Results: From 2011 to 2016 in our clinics were treated 34 patients with FBSS after microdiscectomy on a L3/L4, L4/L5, L5/S1 levels. The most frequently clinical manifestation were low back pain, monoradiculopathy and poliradiculopathy. In this cases before

making the decision about second surgical treatment in addition to traditional complex treatment of chronic pain we used single-shot transforaminal injection of steroids to postoperative area, which considerably improved quality of patient's life.

Discussion: Application of the following method in our clinics led to triple reduction of second surgical treatment.

Keywords: Single-shot transforaminal injection, FBSS, Steroids

EP-0546 [Spine and Peripheral Nerve » Others]

What Differs Between L4-5 and L5-S1 Disc Herniation?

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Background: Lumbar disc herniation, a common cause of low back pain, is more commonly detected at L4-5 and L5-S1 levels. Both Modic changes and lumbo-pelvic parameters are associated with low back pain, lumbar disc degeneration and lumbar disc herniation. In this study, our primary aim was to evaluate whether patients with L4-5 disc herniation were different from those with L5-S1 disc herniation.

Method: Patients, who underwent single level lumbar microdiscectomy in between June 2013 and November 2015, were retrospectively evaluated using the electronic database. Demographic and radiological data were available for only 178 patients. Seventy-four patients underwent L4-5, 79 underwent L5-S1 microdiscectomy. Lumbo-pelvic parameters were evaluated on lateral X-rays. Modic changes were evaluated on T1- and T2-weighted mid-sagittal lumbar spine MRI.

Results: We included 81 male and 72 female patients (mean age: 44.24 years; range: 17-83 years). L4-5 disc herniation was more common in males, whereas L5-S1 disc herniation was nearly equally distributed between genders. Patients with L4-5 disc herniation were significantly older than those with L5-S1 disc herniation. Patients with Modic changes were also older than those without Modic changes. Lumbo-pelvic parameters were similar between the groups.

Conclusion: L4-5 disc herniation is more common in elder and male patients, whereas L5-S1 disc herniation is more common in younger patients. Modic changes are also more common in patients with L5-S1 disc herniation. L4-5 and L5-S1 disc herniation were similar in lumbo-pelvic parameters.

Keywords: Modic changes, Low back pain, Lumbar disc herniation, Magnetic resonance imaging, Surgery

EP-0547 [Spine and Peripheral Nerve » Others]

Spinal Subdural Hematoma After Lumbar Puncture: A Case Report and Review of Literature

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Spinal subdural hematoma is very rare and there are a few reports in the literature after trauma. A 54 years old female with headache and papilledema who admitted and undergone diagnostic lumbar puncture (LP). After LP she developed paraparesis and sphincter problem. In MRI, subdural hematoma revealed and the patient underwent decompression and hematoma evacuation. LP may be complicated by epidural/subdural hematoma. It occurs especially in patients with coagulopathies. There are less than 15 cases of spinal subdural hematoma in the literature.

Keywords: Spinal subdural hematoma, Lumbar puncture, Spinal trauma, Paraparesis

EP-0548 [Spine and Peripheral Nerve » Others]

An Extremely Rare Complication of Lumbar Instrumentation: Iliac Vein Encroachment

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Vascular injuries are very rare complication of spine surgery. Although the overall reported incidence of vascular injuries is less than 0.01%, most authors agree that the incidence of vascular injury in spine surgery has been under reported in the literature to date. 57 years old male patient was operated for L4 fracture caused by trauma. Then patient reoperated because of medially positioned L5 right pedicle screw. After the revision operation, control computed tomography imaging performed. Right L5 pedicle screw have been seen encroached to right iliac vein. Patients consulted to cardiovascular surgery department and they did not suggest any operation. Patient followed up with serial hemogram and abdominal contrasted computed tomographies. Then he mobilized and we saw that he had no pain or any complaint. Finally he was discharged from hospital with follow up suggestions. Vascular complications associated with spinal instrumentation can occur both in the early perioperative period from direct vascular injury as well as in the more distant postoperative period from secondary vascular injury. Secondary injuries may occur from chronic erosion of the arterial wall pulsating against the instrumentation and can occur multiple years after initial hardware placement. Vascular encroachment of major vessels occurs rarely in the setting of freehand pedicle screw placement in the lumbar spine. The aorta seems to be the vessel at highest and iliac vein at lowest risk of injury. Routine intraoperative and postoperative CT scanning allows for early identification of pedicle screws encroaching on vascular structures thereby facilitating early revision surgery.

Keywords: Iliac vein encroachment, Spinal instrumentation, Spinal instrumentation complications

EP-0549 [Spine and Peripheral Nerve » Others]

A Comparison of Intradiscal Ozone with Transforaminal Metilprednizolone and Bupivacaine to Ozone Therapy Alone in the Treatment of Discogenic Pain

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Background: Percutaneous intradiscal ozone therapy is a minimally invasive treatment procedure used in patients with sciatica due to prolapsed lumbar intervertebral disc, in which the goal is to make use of the biochemical properties of oxygen-ozone mixture. It is used alone or in combination with the injection of mixture of metilprednisolone and bupivacaine into the postganglionic epidural space transforaminally. The aim of this prospective study is to assess the outcome difference of these two treatment modalities in nonsurgical lumbar disc diseases.

Method: In 2016, 50 patients who suffered from discogenic pain were treated with intradiscal ozone injection in combination with transforaminal injection, and 22 patients received ozone therapy alone. All patients underwent follow up examination at 1 month and 3 months postoperatively. Visual Analog Scale (VAS) was used to assess pain intensity, and functional outcome was analyzed by Oswestry Disability Scale.

Results: Although the patients treated with in combination with transforaminal injection showed slightly better VAS and Oswestry scores at 1 month, no clinical significance was found at 3 months.

Conclusion: Despite of no difference between these two procedures at 3 months, because ozone therapy in combination with transforaminal injection offers immediately pain relief, combining these two treatment modalities seems to provide a shorter period of recovery time.

Keywords: Lumbar disc herniation, Oxygen ozone therapy, Transforaminal injection

EP-0550 [Spine and Peripheral Nerve » Others]

Forestier's Disease: Case Report and Review of the Literature

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Forestier's disease is a musculo-skeletal disorder characterized by a calcification of ligaments. It is characterised by diffuse exuberant hyperostosis in anterolateral faces of the vertebral bodies essentially affecting the anterior longitudinal ligament. It generally affects males over 50 years. It is often incidentally discovered on standard spine X rays. Even more rarely, it manifests by neck stiffness, pain or dysphagia. We present a case of a 70 years old patient with difficulty in swallowing solids for several months. Pharyngolaryngoscopy revealed a bulging of the pharyngeal wall indicating an extrinsic compression. Barium swallow showed paravertebral ossification affecting five consecutive vertebrae from C3 to C7. CT-scan confirmed the osseous proliferation with a split between the vertebral body and the hyperostosis confirming the diagnosis of Forestier's disease. The patient was operated with good post-operative outcomes. In conclusion, Forestier's disease presents with exaggerated hyperostosis can result in complications requiring neurosurgical intervention.

Keywords: Forstiers's disease, Ligamental ossification, Dysphagia

EP-0551 [Spine and Peripheral Nerve » Others]

Ligamentum Flavum Hematoma: A Very Rare Cause of Foot Drop

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Ligamentum flavum hematoma is a very rare entity that can occur in any part of the spine. Etiology is still unclear while the minor trauma and ligamentum flavum degeneration are the potential suspects. Patients can present with either radiculopathy or myelopathy according to the location. MRI is the most important tool for the proper diagnosis. The differential diagnosis include juxtafacet cysts, disk herniation and spinal cord tumors. Treatment is usually surgical with favorable surgical outcomes. Ligamentum flavum hematoma should be kept in mind in the differential diagnosis of intraspinal cystic lesions that lead to neurological deficits.

Keywords: Ligamentum flavum hematoma, Foot drop, Intraspinial cysts

EP-0552 [Spine and Peripheral Nerve » Others]

Spiritual Significance of Spine - What is the Evidence?

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Human race has been interested in soul and its location has been debated since the time immemorial. The main contest has been between heart and brain however according to some literature spine also has important connection. The author has an interest in this subject and has found interesting evidence with reference to spine in the world literature. This is not only based on the ancient Indian scriptures but also mentioned in Western philosophy. Most fascinating facts have been revealed that may be correlated with some of the modern concept on neuroanatomical connections in the spine. Like Istanbul, the venue for the WFNS 2017, this topic is also of interest where Eastern and Western literature has some common agreements. More importantly, there are some findings from the ancient literature that could be extrapolated to the modern knowledge of spine.

Keywords: Spine, Spiritual, Energy, Heritage, East, West

EP-0553 [Spine and Peripheral Nerve » Others]

Efficacy of Goreisan for Syringomyelia with Chiari Malformation Type1

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Background: The natural history of Chiari malformation type

1 and syringomyelia is unpredictable. Spontaneous resolution of syringomyelia without surgery and remaining syringomyelia after surgery have been reported. The purpose of this study was to investigate the efficacy of Goreisan (TJ-17) for syringomyelia associated with Chiari malformation type 1. Goreisan (TJ-17) is a Japanese herbal Kampo medicine for treatment of prevention of postoperative recurrence of chronic subdural hematoma.

Method: Three women with syringomyelia due to Chiari malformation type 1 were enrolled in this study. The mean age was 46.3 years (range: 37-58 years) and the mean levels of syringomyelia was 14.3 levels. Goreisan was used for two remaining syringomyelias after surgery and one mild expanded syringomyelia without surgery. The follow-up periods from using Goreisan was 13 months (range: 10-16 months). The size of syringomyelia was evaluated by T2-weighted axial images.

Results: The sizes of syringomyelia were reducing in two cases and unchanged in one case with surgery.

Conclusion: Goreisan was effective for syringomyelia associated with Chiari malformation type 1.

Keywords: Goreisan, Syringomyelia, Chiari malformation type 1

EP-0554 [Spine and Peripheral Nerve » Others]

Spinal Epidural Arachnoid Cyst: About Four Cases

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Spinal epidural arachnoid cyst (SEAC) is a benign disease of unknown pathogenesis. It results from a small defect of the dura that leads to cerebrospinal fluid accumulation and communication defect between the cyst and the subarachnoid space. Usually asymptomatic, it can cause serious neurological sequela, especially when the treatment is delayed. We report our experience in the management of SEAC through a retrospective analysis of four cases treated at the department of Neurosurgery University Hospital of Fez, Morocco. There were three males and one female patient. The mean age was 35 years old (range: 16 to 56 years old). All patients have had clinical symptoms of spinal cord compression. Spinal MRI was performed in all cases. It revealed a fluid epidural collection, having the same signal characteristics as the cerebrospinal fluid, and compressing the spinal cord. The location of the SEAC was thoracic in all cases and was located in respect to one or two vertebral levels. However, the arachnoid cyst extends from C6 to T8 in one case. All patients underwent surgery through a posterior approach. The resection of the cyst wall and ligation of the neck was done in three cases. However, a duraplasty associated to resection of the cyst was done in the other case. Histological study confirmed arachnoid cyst in all cases and the postoperative course was favorable.

Keywords: Epidural arachnoid cyst, Spinal cord, Surgery

EP-0555 [Spine and Peripheral Nerve » Others]

Spontane Spinal Epidural Hematoma; Case Report of Three Patients

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Spinal epidural hematoma that occur spontaneously or following the trauma as LP, epidural anesthesia, fracture, spinal surgery or chiropractic manipulation. Occurs predominantly in patient who is anticoagulated, thrombocytopenic or has a vascular lesion. Spontane spinal epidural hematome (SSEH) is very rare and it's etiologies may be hemorrhage from spinal cord AVM, from vertebral hemangioma or tumor. SSEH may occur at any level of spine, however, thoracic is most common. Most often located at posterior to spinal cord, facilitating removal via laminectomy. In this study, medical records were reviewed of 3 patients (all of them women; mean age 65 years) who suffering from sudden hemiplegia or hemiparesis because of SSEH. The clinical pictures of the patients showed that the patients had SSEH at servical level which have distribution as C3-4 / C5-6 / C6-7. They operated with hemylaminectomy to removal the hemorrhage. The mean follow up was 33.3 months (6 – 40). One case returned to their physical activity like preoperation. One of the patient used ecopirin, one used clexane and the other used NSAİ drug. The patient evaluated with DSA after the operation, but none of them had spinal AVM. Although conservative treatment is possible in SSEH without neurologic impairment, in case of neurologic impairment, diagnosis with emergent spinal MRI and surgical treatment is very important.

Keywords: Spontane, Spinal, Epidural, Hematoma

EP-0556 [Spine and Peripheral Nerve » Others]

Neurosurgical Management of Handicapping Spasticity

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Spasticity represents handicapping sequellae after head and spinal injury, CVA, cerebral palsy, multiple sclerosis and other upper motor neuron insults. Classical oral antispastic drugs or botulinium toxins, intensive physiotherapy are of great help, but in spite of all these, spasticity continue to develop in many patients, "especially in spinal cord injury and cerebral palsy patients", which compromise the physiotherapy and rehabilitation plan. The improvement in basic understanding of the problem, with the concept of useful and harmful spasticity, sophisticated neurophysiological examinations, advancement in microsurgical techniques combined to intra-operative electrical stimulation and neurophysiological monitoring. All these factors played significant roles in improving the management of spasticity where many international and surgical techniques are well developed such as the functional posterior rhizotomy and the selective peripheral microsurgical neurectomies, the DREZ and the intrathecal chronic infusion of Baclofen. With

all these factors, functional neurosurgery has shifted to improve the functional results in spastic patients, choosing co-operation rather than competition with the other disciplines concerned by spasticity treatment. The neurosurgeon specialised in spasticity represents only one part of a comprehensive team composed of physiatrist or paediatric neurologist, physiotherapist, orthopedist and nursing. Multidisciplinary team, help making comprehensive therapeutic decisions in pre-operative patients' selection, surgical technique and post-operative planning. This paper we will cover many techniques used in our interventional approach to treat these patients.

Keywords: Spasticity, Cerebral palsy, Handicapping, DREZ

EP-0557 [Spine and Peripheral Nerve » Others]

The Role of the Features of Facet Joint Angle in the Development of Isthmic Spondylolisthesis in Young Male Patients with L5-S1 Isthmic Spondylolisthesis

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Aim: To investigate the facet tropism and its role in the development of lumbar isthmic spondylolisthesis (IS) in young male adults.

Method: Bilateral facet joint angles were measured axially at the level of L3-4, L4-5 and L5-S1 in the lumbar computerized tomography (CT) of the 97 individuals (46 patients with IS and 51 control) aged between 20 and 29. Classification was as follows: If the difference between the two corresponding facet angles is $<6^\circ$, no tropism; if it is $6^\circ-12^\circ$, moderate tropism; and if it is $>12^\circ$, severe tropism.

Results: For the patients with IS, no tropism in 43.5% (n=20), moderate tropism in 50% (n=23) and severe tropism in 6.5% (n=3) at the level of L3-4. For the level of L4-5, no tropism in 28.3% (n=13), moderate tropism in 60.9% (n=28) and severe tropism in 10.9% (n=5). For the level of L5-S1, no tropism in 32.6% (n=15), moderate tropism in 39.1% (n=18) and severe tropism in 28.3% (n=13). For the control group, no tropism in 86.3% (n=44), moderate tropism in 13.7% (n=7) and no severe tropism at the level of L3-4. For the level of L4-5, no tropism in 80.4% (n=41), moderate tropism in 17.6% (n=9) and severe tropism in 1.9% (n=1). For the level of L5-S1, no tropism in 68.6% (n=35), moderate tropism in 29.4% (n=15) and severe tropism in 1.9% (n=1).

Conclusion: Facet angle tropism is seen in a high proportion of patients with IS and seems to be a predisposing factor in the etiology of IS.

Keywords: Isthmic spondylolisthesis, Facet joint tropism, Young adult, Computerized tomography

EP-0558 [Spine and Peripheral Nerve » Others]

Spinal Instrumentation in Bangladesh: My Experience of 752 Cases

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Background: Spinal instrumentation is a method of stabilising the unstable spine to keep it proper alignment and to prevent injury or irritation of the spinal cord or nerve roots and to prevent incapacitating deformity. Spinal stabilisation by instrumentation is a gold standard in unstable spine to achieve good neurological recovery & to prevent complications.

Method: In the last few decades there is rapid expansion of surgical armamentarium for the treatment of spinal instability & compressive cord injury. We operated 752 cases for vertebral instability. Common cause is trauma 400 cases, TB spine 55, degenerative spine diseases 288 & vertebral tumour 9 cases. Types of implant uses for cervical spine are anterior cervical plate & screw, lateral mass screw & rods, Wire and cables, titanium Mesh cage, peek cage, self expandable cage.

Results: For thoracolumbar spine -transpedicular screw and rod, Luque rods, Harrington's rod, Steffee plates. Complete recovery 348 cases. No recovery 73 patients. Postoperative infection 6 cases managed by antibiotics, Graft migration 3 cases, dysphasia in cervical cases in 54, loosening of transpedicular screw 6 cases, respiratory problems in 3 cases, death 2 cases.

Conclusion: So, we conclude that early reduction, decompression & stabilization by instrumentation is an effective procedure for good neurological & functional recovery for unstable spine. Our results are encouraging.

Keywords: Unstable spine, Spinal instrumentation, Fusion

EP-0559 [Spine and Peripheral Nerve » Others]

Arachnoiditis Ossificans Taking the Aspect of a Spinal Tumor: Presentation of a Case with a Diagnostic and Therapeutic Challenge

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Arachnoiditis ossificans of the spine is a very rare entity defined as an ossification of the leptomeninges resulting in neurologic declines. We describe the case of a 42-year-old woman, without any obvious predisposing factor, who presented with very progressive cauda equina syndrome. The imaging findings on magnetic resonance imaging (MRI) was confusing by showing an intraspinal lesion taking the aspect of a tumor extending from L2 to L5. The computed tomography scan with three-dimensional reconstruction was more specific by showing imaging suggestive of a huge calcification of the thecal sac sheathing the nerve roots of the cauda equina. The patient underwent a large lumbar laminectomy with an incomplete resection of the ossified arachnoid, but the neurological function didn't improved. The histological study confirmed the bony nature of the lesion. Analysis of this observation highlights the importance of 3 D computed tomography scanning for the establishment of the diagnosis. A brief literature review is presented, discussing the pathophysiology and therapeutic strategy of this rare disease that are still controversial.

Keywords: Arachnoiditis ossificans, Computed tomography scanning, 3D reconstruction, Decompressive surgery

EP-0560 [Spine and Peripheral Nerve » Others]**Percutaneous Oxygen-Ozone Nucleolysis in Cervical Disc Disease: Experience with 11 Patient**

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Background: Ozone therapy is a minimally invasive treatment procedure that is used in cases with cervical disc herniation without free disc fragment, for whom microsurgical intervention is not considered, and medical treatment has no benefit. The aim of this prospective study is to assess the value of this procedure.

Method: In 2016, 11 patients (7 females, 4 males; ages range between 25 and 57) with cervical discopathy pain due to cervical disc disease were treated with ozone therapy. Visual Analogue Scale (VAS) was used to determine pain intensity, and modified Macnab criteria for quality of life.

Results: Before treatment, the report of modified Macnab evaluation was poor in 9 patients and moderate in 2 patients. After cervical intradiscal ozone treatment, 9 patients showed significant improvement and no change were observed in 2 patients. Also there was a significant decrease of pain was found in their mean VAS scores.

Conclusion: Despite this is small series for statistically investigation, the results of our study recommends that percutaneous ozone therapy offers good pain relief in selected patients with cervical disc herniation who got no benefit from medical treatment.

Keywords: Cervical disc herniation, Oxygen-ozone therapy, Percutaneous ozone therapy

EP-0561 [Spine and Peripheral Nerve » Others]**The Role of Electromagnetic Navigation in Spine Surgery: Preliminary Report**

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Aim: To evaluate the feasibility and accuracy of the electromagnetic navigation in spine surgery.

Method: Ten patients were operated for spinal fixation in the presence of electromagnetic navigation. The preoperative thin cuts CT scan was transferred to the navigator. The usual surgical exposure of the spine was performed. The localizer was attached to the spinous process in the middle of the operative field. Registration was performed by selected four anatomical landmarks. The process of the fixation was performed depending on the anatomical knowledge and under the guidance of C-Arm. The accuracy of the navigation was checked at every stage of fixation in correlation to the anatomical landmarks and the images obtained from the C-Arm. The navigation was tested during determining the entry point of the screws as well as the guidance of the screws into the pedicles. The accuracy of the navigation was then correlated to the postoperative CT scan.

Results: The registration process was obviously faster than the conventional optic navigation. The initial results showed good accuracy of the electromagnetic navigation. The navigation corresponded to the anatomical strictures in the surgical field, to the intraoperative images acquired from the C-Arm, and to the postoperative CT scan.

Conclusion: The electromagnetic navigation is an accurate navigation system. It could be very promising in complex spinal fixation procedures.

Keywords: Electromagnetic navigation, Spinal fixation, Complex spine surgery

EP-0562 [Spine and Peripheral Nerve » Others]**Developmental of a Patient Specific 3D-printed C1 Spine Model Preoperative Modelling for Comprehensive and Practical Vision System of Patient Specific Mass Screw Fixation**

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Background: Fatal complications of screw cervical fixation are such as vertebral artery (VA), carotid artery and spinal cord injuries. To clarify the landmark for deciding the entry point for C1 lateral mass screws via the posterior arch by using life-size three dimensional patient specific cervical spine model. 3D neck modeling was created both pre and post operatively to determine the possible variations of the neuroanatomical formations of the screwing and to observe the success rate of the screwing in the treatment of vertebral fractures.

Method: A total of 10 patients with C1 fractures were recruited, dual CT scan data from C1 pre and post screwing were transformed into 3D patient specific life-size cervical spine model. These models were analyzed to obtain detailed information of each pedicle, VA and curvature of spine were used as an intraoperative reference. Diameter of the spinal canal, transverse foramen diameter, distance from midline to transverse foramen and distance from midline to transverse foramen, the height and the area of pedicles were investigated in the 3D cervical spine models.

Results: Non bony elements such as difference in the course of the VA and arterial diameter were determined.

Conclusion: 3D printing cervical model provides an accurate representation of the fracture location, pedicle size and VA shapes. Individual screw fixation has superiority over transarticular screw fixation because cervical transarticular fixation has several limitations, including the position of the VA, high riding VA, thoracic kyphosis, and obesity. This individualized 3D printing screw insertion template was user-friendly, moderate cost, and enabled a radiation-free cervical screw insertion.

Keywords: Patient specific, 3D-printed, C1 Spine, Screw fixation

EP-0563 [Spine and Peripheral Nerve » Others]**Thoracic and Sacral Intra Spinal Hematopoiesis Secondary to Thalassemia Intermedia: An Extremely Rare Association**

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Extramedullary haemopoiesis (EMH) associated with thalassemia is an extremely rare cause of spinal cord compression. Simultaneous thoracic and sacral spinal EMH has never been reported before. The authors report a very rare case of an EMH that occurred simultaneously in the thoracic and sacral spine in a patient. A 19-year-old-man with known medical history of Thalassemia Intermedia and splenectomy experienced weakness in his legs and increased frequency of urination with urgency. On physical examination, the patient was pale. Motor examinations revealed a spastic paraparesis. Babinski sign was positive bilaterally. Sensory examination revealed decreased pain, temperature and touch sensation below T6T7 level. His hemoglobin count was found to be 5.4 g/l. MRI of the neuroaxis demonstrated thoracic and sacral epidural masses. The thoracic mass arose posteriorly to the cord and extend from T5 to T9, compressing the spinal cord. The sacral mass arose anteriorly and extended from S1 to S4. The patient was operated urgently. After laminectomy, the extradural mass was totally removed. He received a total of 800 ml of packed red white blood cells. His neurological deficits completely improved after surgery. Spinal cord compression secondary to EMH is a rare neurosurgical entity. Management options include transfusion therapy, radiotherapy, surgery, or a combination of modalities. Early diagnosis of EMH will affect the course of management and may reduce the incidence of irreversible neurologic damage that would otherwise occur with prolonged undiagnosed cord compression.

Keywords: Spine, Extramedullary haemopoiesis, Thalassemia intermedia, Cord compression, Surgery

EP-0564 [Spine and Peripheral Nerve » Others]**Radiofrequency Thermocoagulation of Ganglion Impar in the Management of Coccydynia: Long-Term Results**

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Aim: To investigate the short- and long-term effect of ganglion impar radiofrequency (RF) treatment in patients with chronic coccygodynia.

Method: We retrospectively analyzed the medical records of the patients whom RF ablation of ganglion impar were done between 2009-2011. The pain intensity factor VNS and the quality of life indicator EQ5D scores were recorded pre- and post-intervention 1st,6th,12th months. The difference between preprocedural and

6th and 12th mo. postprocedural VNS scores were evaluated. The success of intervention recorded as the percentage of the difference between pre-intervention with post intervention 6th and 12th months VNS scores.

Results: The mean age of the patients was 48.7 ± 14.3 with 11 females (55%) and 8 males (45%). The average follow-up duration was 17.3 ± 2.9 months. Statistically significant differences were observed between the preprocedure and post-procedure VNSs ($p < 0.0001$). Improvements in VNS scores were correlated with improvements in the EQ-5D scores. Midterm (6th months) and long-term (12th months) evaluation after the treatment revealed that 67.4 % and 61.1 % of the patients had a successful outcome.

Conclusion: Our data suggested that RFT destruction of ganglion impar in patients with chronic coccydynia had an effective outcome and patients responding to RFT had significantly lower post-RFT pain scores.

Keywords: Coccydynia, Ganglion impar, Radiofrequency thermocoagulation

EP-0565 [Spine and Peripheral Nerve » Others]**Cervical Osteochondroma**

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Osteochondroma is a benign bone hamartoma known as chondroma or osteocartilaginous exocytosis. Osteochondromas are thought to develop at secondary sites of ossification and are found in the spinous process, lamina, and transverse process. Also, osteochondroma is usually seen in the appendicular skeleton. Additionally, computed axial tomography is the reference method for diagnosis and surgical treatment. They might be located very rarely in the spine; however, they can be managed properly if a suspected diagnosis is established. Surgical treatment involves resection of the tumor, and it is the ideal method of treatment because it relieves the symptoms almost immediately. 53 year old female, she has had a neck and arm pain for four years and the pain has been increase more for last one year. Neurological examination of the patient, weakness in upper extremity, hyperactive deep tendon reflexes, urinary incontinence. Computed tomography (CT) scans of the cervical spine showed the at the level of C2 vertebrae, exophytic skeletal lesions extending into the spinal canal of the left lamellar line, extending from the right neural foramen to the C6 vertebrae level (exostosis?). Also, magnetic resonans (MRI) scans of the cervical spine showed the level of the C6-7 intervertebral disc, hyperintense in the T1A series, heterogeneous hypointense in the T2A series, and lesion size of approximately 4x7 mm without contrast enhancement was observed in the medial compartment of the left facet joint. The patient was operated on Cervical hemilaminectomy. The best choice of treatment for spinal osteochondromas is surgical excision or curettage and spinal stabilization, if it is necessary.

Keywords: Cervical spine, Hemilaminectomy, Osteochondroma

EP-0566 [Spine and Peripheral Nerve » Others]**From Spontaneous Intracranial Hypotension to Intracranial Hypertension Because of Arachnoid Cyst: Case Report**

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Spontaneous intracranial hypotension (SIH) causes a rare and curable secondary headache. Arachnoid cysts are usually benign, asymptomatic lesions and are discovered by accident. We present a novel case secondary to SIH, whose treatment was complicated by the presence of a coincidental temporal arachnoid cyst. Noninvasive approaches were not useful in the patient's treatment; the unilateral resorption of the subdural effusion due to the temporal arachnoid cyst changed the brain dynamics from intracranial hypotension to hypertension. The clinical symptoms of SIH may vary because of traction on eloquent structures of the central nervous system (such as cranial nerves or spinal roots) or prolonged venous engorgement due to low cerebrospinal fluid (CSF) pressure, so misdiagnosis of SIH could be dangerous as a result of a life-threatening subdural hematoma or venous sinus thrombosis. Neuroimaging is quite helpful for diagnosis. Subdural effusion, pachymeningeal thickening, engorgement of venous structures, pituitary hyperemia and sagging of brain can be discerned in magnetic resonance imaging. However, the spectrum of clinical and radiographic findings is wide and skipping diagnosis in headache patients is common. Despite the growing volume of publications helping to develop a treatment algorithm for the management of patients with SIH, no evidence based approach has hitherto been available. The purpose of this presentation was to discuss our treatment and management approaches to treating a complicated case of SIH with a temporal arachnoid cyst.

Keywords: Intracranial hypotension, Orthostatic headache, Arachnoid cyst, Myelography

EP-0567 [Spine and Peripheral Nerve » Others]**Outcomes of Spinal Surgical Treatment in Rheumatoid Arthritis Who Used Arava (Leflunomide) for Long-Term: Analysis of Ten Patients**

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Background: Rheumatoid Arthritis (RA) is a systemic chronic disease which affect all body organs especially joints. For chronic RA physicians describe disease-modified antirheumatoid drugs (DMARDs). The most common used DMARDs are Arava (leflunomide), Azulfidine (sulfasalazine), Plaquenil

(hydroxychloroquine), and Methotrexate. This study presents the surgical outcomes of in RA who used leflunomide for long-term.

Method: The RA patients who were used Arava for long-term (>5years). They operated between the years 2012 and 2014, for degenerative spinal diseases (LDH, LSS, instability and chronic abscess) at neurosurgery department in BRSHH institution. The surgical outcomes were evaluated retrospectively.

Results: 10 (9 female, 1 male) patients were operated for degenerative spinal diseases. The mean age was 65.4±5.6 (59-77). All patients had back and extremities pains. Preop- and postoperative ODI were improved from 69±7.73%(62-84) to 23±9.10%(8-38). 5 (4 female, 1 male) patients underwent laminectomy, 3 females underwent discectomy and one female underwent anterior fusion and instrumentation after resection of L4 abscess. All patients were improved apparently from surgeries. Back and leg VAS were improved from 7.8±1.32(6-9) and 8±1.15(7-10) to 2±0.82(1-3) and 2.8±0.79(2-4), respectively. One out of the patients, who were underwent laminectomy and discectomy, was presented with SSI after 2 weeks. Antibiotics was the sufficient to treat her. Anterior and posterior instrumented 76 and 59 aged two females were suffered of unhealed SSI then sepsis was diagnosed before died on postoperative 103rd and 27th days, respectively.

Conclusion: We recommend to study the indication well before instrumentation the patients who used DMARDs for any chronic disease. We thought that use DMARDs for long-term(>5years) is a contraindication for instrumentation.

Keywords: Arava (Leflunomide), Rheumatoid arthritis, DMARDs, Instrumentation

EP-0568 [Neuro-oncology » Basic Science]**Coexistence of Transitional and Fibrous Meningioma in the Same Patient**

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Meningioma is often benign, slowly growing, extraxial, arachnoid lesions. Cure is often provided in the case of total excision. These tumors are most often found near the top and the outer curve of the brain. Tumors may also form at the base of the skull. Some contain sacs of fluid (cysts), mineral deposits (calcifications), or tightly packed bunches of blood vessels. There are various histopathological types of meningioma. Coexistence of different types in a same patient is quite rare condition. A 43-year-old woman presented with headache and epileptic aura. Her neurological examination was found to be normal. A contrast-enhanced computed tomography and magnetic resonance imaging scans revealed right parietal avidly enhancing tumors in three different extra-axial localizations. An increase in the tumor size was detected in the follow-up of the patient. Surgical resection was planned for the patient. Three independently different tumoral masses were gross total excised. One of the tumoral masses was found to be transitional meningioma and two of the tumoral masses were found to be fibrous meningioma in the pathological examination. Coexistence of different types of meningioma in a same patient is extremely rare condition. However, it is useful to think of this possibility and send the masses in different localizations separately to the pathological examination.

Keywords: Meningioma, Intracranial tumor, Pathology

EP-0569 [Neuro-oncology » Basic Science]**Trigemino-Cardiac Reflex in Vestibular Schwannoma Surgery. Our Experience and Literature Review**

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Background: Bradycardia in Neurosurgery and especially in vestibular schwannoma surgery is a pejorative sign which manifests itself when there is tumor adherence to the brainstem. It can be a major factor limiting tumor excision. This hypothesis is now questionable; is it valid?

Method: We have operated 174 vestibular schwannomas KOOS stage III or IV by retrosigmoid approach in the period 2008-2015.

Results: We observed 14 cases where the patients presented with bradycardia following tumor dissection from the trigeminal nerve and not the brainstem as previously thought. This phenomenon was first described by Schaller in 1999 as a reflex between the trigeminal nerve and the heart rather than the brainstem. However it is from 2004 that it was considered a physiological phenomenon rather than pathological and in 2009 was when it was actually recognized as a brainstem reflex. Further subtypes of TCR have been defined based on trigger points at the proximity of the central nervous system or at peripheral nerve branches. Central (proximal) TCR is triggered upon stimulation of the intracranial course of the trigeminal nerve, namely from the Gasserian ganglion to the brainstem. Peripheral (distal) TCR is elicited upon stimulation of the trigeminal nerve anywhere throughout its course outside the cranium to the Gasserian ganglion.

Conclusion: The various studies published describing the mechanism of the trigeminocardiac reflex makes the notion of performing partial excision of vestibular schwannomas due to bradycardia resulting from brainstem adherence a notion of the past.

Keywords: Trigemino-cardiac reflex, Vestibular schwannoma, Brainstem

EP-0570 [Neuro-oncology » Basic Science]**Differential Expression Patterns of Apoptosis, Angiogenesis, Invasion and Cancer Cell Related Proliferation Markers at Protein Levels in GBM Tumor Samples**

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Glioblastoma Multiforme is the most common Central Nervous System tumor. GBM constitutes 60-70 percent of all gliomas. The word "multiform" identifies clinical characteristics of tumors, genetic variations, different and heterogenic therapeutic responses in disease. Activation of PI3K/AKT/mTOR pathway is one of the most important pathway that plays role in disease pathogenesis. In our study, we aim to investigate the expression patterns of some of the major genes that have important roles in PI3K/Akt/mTOR

pathway in Glioblastoma Multiforme tumor samples at protein expression level. CASP-3, BCL-2, BAD, BAX, HIF1A, VEGF, FAK, MMP-9, GSK-3, CCND1, c-MYC, CDK4, B-Act protein expression levels were detected by western blotting analysis in 15 GBM+ tumor samples. This differential protein expression patterns might be an important prognostic indicator of treatment response for anti-angiogenic therapy (HIF1A, VEGFA) and for metastasis-prone, aggressive tumor types like FAK, MMP-9 expression. This variable protein expression patterns can be useful in GBM patient stratification and also needs to be confirmed with further follow-up studies for a prognostic biomarker of treatment response or survival.

Keywords: Glioblastoma multiforme, Patient stratification, PI3K/AKT/mTOR

EP-0571 [Neuro-oncology » Basic Science]**New Pathogenetic Approach to Prevent Relapse of Malignant Gliomas in the Postoperative Period**

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Background: Brain gliomas are still the most difficult problem particularly in neurosurgery and in oncology in general. The aim of the work is to identify tumor-associated inflammation in patients with gliomas in the postoperative period, which would indicate incomplete removal of malignant gliomas.

Method: Blood was taken from 65 patients before and after surgery on the 7th day. Initial 0.25% verapamil hydrochloride solution (company "Farmak") beziionnoy diluted with water from 1:10 to 1:100,000 times. The level of aggregation of blood during inflammation operdelyali with an instrument "Plasmon" Using nanotechnology principles that allows to register the intercellular interaction at nanoscale distances (of the order of 200-300 nm). PPR is considered an indicator shift of the resonance curve SPR, measured in degrees.

Results: Indicators of the aggregation of blood cells in the tumor-associated inflammation in glioblastomas decrease in total removal of gliomas, as glioblastoma does not release glutamate, which stimulates the growth of gliomas.

Conclusion: This paper presents a laboratory rapid method for determining the effectiveness of the removal of malignant gliomas by selective exposure to calcium channel blocker - verapamil in high dilutions. If total removal of gliomas verapamil helps to reduce the aggregation of blood cells, and in subtotal - increase the level of aggregation of blood cells. These data can be used in clinical practice to monitor the effectiveness of long-term preventive measures for the prevention of relapse of malignant gliomas in the remote postoperative period.

Keywords: Glioblastoma, Tumors removal efficiency, Verapamil

EP-0572 [Neuro-oncology » Basic Science]**Prognostic Factors of Survival in Moroccan Patients with Glioblastoma**

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Background: Glioblastoma is the most common and aggressive glioma with a poor survival. Some parameters have been identified as potential prognostic factors. Our purpose is to examine the influence of clinical, tumor and treatment factors on overall survival in Moroccan patients with newly diagnosed glioblastoma.

Method: We retrospectively analyzed data from 89 Moroccan patients with newly diagnosed Glioblastoma (54 males and 35 females). The effect of different prognostic factors on survival was evaluated using Kaplan-Meier method and log rank test for univariate analysis; and Cox regression method for multivariate analysis to identify the independent prognostic factors.

Results: The Median age of patients at diagnosis was 52 years (range 11-84 years) and the male/female ratio was 1.54/1. The median of pre-operative Karnofsky Performance Score (KPS) was 70 (95% CI: 60-70) and the median overall survival was 12 months (95%: 9-13 months). According to univariate analysis, age ($p = 0.0088$), KPS ($p = 0.0001$) and radiation treatment ($p < 0.0001$) parameters were significantly associated with survival. In addition, the tumor size, KPS and radiotherapy parameters were significantly associated with survival in multivariate Cox analysis ($p < 0.05$). However, extent of tumor resection, gender, chemotherapy and clinical history delay factors were not found significant in both analyses ($p > 0.05$).

Conclusion: Our results showed the strong prognostic value of age, performance score, and treatment with radiotherapy for glioblastoma patients validating the results published in previous studies. This work could contribute towards informing further research on prognostic variables for patients with glioblastoma.

Keywords: Glioblastoma, Prognosis factors, Radiotherapy, Outcome, Moroccan patient

EP-0573 [Neuro-oncology » Basic Science]

Epidemiological Aspects of Primary Brain Tumors in Samarkand Region

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Background: The incidence of primary brain tumors (PBT) in the world is from 2.4 to 21 cases per 100.000 people. Questions of clinical epidemiology of PBT in the Republic of Uzbekistan have been insufficiently studied. Purpose of the study is to study the epidemiological aspects of PBT in the Samarkand region, this is the second most populous.

Method: From 2004 to 2013, 883 cases of patients with PBT been registered. The men were 456, women - 427 between the ages of 2 months to 83 years.

Results: The incidence of primary brain tumors in 2004 was 2.7 cases per 100.000 populations, in 2013 - 4.6. The peak incidence occurred in the age of the patients 41-50 years.

Supratentorial location of tumors was observed in 76.4% of cases, subtentorial - in 23.6%. Hemispheric localization of the tumor was detected in 523 (59.2%) cases. The second highest rates were tumors of the cerebellum, in 104 (11.8%) cases, tumors of chiasmosellar region - in 75 (8.5%), tumors of the lateral ventricles - in 35 (3.9%). Histological distribution of tumors showed that the most frequent neuroepithelial tumors - in 54.9% of cases (328). Meningiomas detected in 28.1% of cases (168), acoustic neuromas - in 3.5%

(21), tumors of chiasmosellar area - in 3.9% (23), tumors of the hematopoietic system - in 3.0 % (18), germ cell tumors - in 3.5% (21).

Conclusion: The incidence of primary brain tumors in Samarkand region is 4.6 cases per 100,000 populations per year, with marked increase in the annual incidence.

Keywords: Epidemiology, Primary, Brain, Tumor

EP-0574 [Neuro-oncology » Basic Science]

Effect of Sonodynamic Therapy with 5-Aminolevulinic Acid on Malignant Gliomas

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Background: Photodiagnosis (PD) with 5-aminolevulinic acid (5-ALA) is useful to detect malignant glioma tissue during surgery. On the other hand, photodynamic therapy (PDT) with 5-ALA is not yet popular for malignant gliomas. One of the problems of PDT for gliomas is the limit of penetrating distance of light. Since glioma grows invasively into deep tissue, its effect does not reach the peripheral of the tumor. Ultrasound instead can conduct its energy into the deep tissue with less attenuation and is known to activate photosensitizing drug like light. We have been investigating its application for glioma treatment and report the different effects on two glioma cell lines.

Method: Two human malignant glioma cell lines (U-87 MG, SNB-19) were cultured in exponential growth phase. The glioma cells were treated with 5-ALA for 4 hours and then enclosed in plastic tubes. Ultrasonication (US) was performed at the condition of 2.0W/cm², 1.0MHz, 5min and the depth of 3 cm. As control, 5-ALA(-) or US(-) groups were set. The number of cells was counted immediately after SDT and after 48 hour-incubation.

Results: The SDT with 5-ALA showed suppressive effect (approximately 15% by comparison with a control data) on U-87 MG. Whereas no effect was seen in other groups of U-87 MG, and all groups of SNB-19.

Conclusion: SDT with 5-ALA has the potential as an option for treatment of malignant glioma. The conditions have to be investigated for its stable effectiveness. The mechanism of action should also be elucidated to understand the differential effects on each cell lines.

Keywords: Malignant glioma, Ultrasound, 5-aminolevulinic acid

EP-0575 [Neuro-oncology » Basic Science]**Intracranial Tuberculoma: Report of Two Cases**

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Intracranial tuberculomas develop in 1% of neuro tuberculosis (Tb) patients. The incidence was high by the year 1900 but diminished following the investigation of the drugs and vaccine. Nowadays, human immunodeficiency virus, alcoholic and intravenous drug abusers, transplantation resulted with increase in incidence. We present a case with tuberculoma mimicking intracranial mass without Tb history and primary focus and another case with multiple intracranial tuberculoma, active Tbc and primary focus.

Keywords: Intracranial tuberculoma, Surgery, Antituberculous, Chemotherapy

EP-0576 [Neuro-oncology » Basic Science]**Primary Cerebral Lymphomas: Is Conservative Treatment Enough?**

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Primary cerebral lymphomas are the second most common brain tumors following gliomas. Most neurosurgeons think that primary cerebral lymphomas don't need surgery, are easily cured by oncologists through corticosteroid treatment which causes them to disappear and that biopsy is just what they need. This assumption is far from being correct. A search in Pubmed and Medline databases, in accordance with cases of our institution, showed that primary cerebral lymphomas are extremely malignant lesions which can kill the patients in a month even after total removal if radiotherapy and chemotherapy is not done. Even if radiotherapy and chemotherapy are administered, median survival is no longer than fourteen to sixteen months. We present our cases and in accordance with some recent publications we communicate our opinion that an attempt at gross total resection is reasonable for patients with solitary lesions that can be removed without morbidity.

Keywords: Lymphoma, Malignancy, Surgery

EP-0577 [Neuro-oncology » Basic Science]**Novel Function of Glioma Stem Cells in Tumor Tissue Remodeling: Inducing Host Cells Malignant Transformation in Tumor Microenvironment**

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Background: Several kinds of tumor-associated parenchymal cells in tumor microenvironment interacted with glioma stem cells (GSCs) play vital roles in tumor progression. However, whether these cells only act as pro-tumor factors or undergo malignant transformation, together with molecular mechanism kept largely unknown.

Method: Myeloablative damage of bone marrow by irradiation in nude mice, bone marrow expressing green fluorescent protein (GFP) was transplanted to establish a GFP-bone marrow reconstructed nude mouse model. GSCs transfected with red fluorescent protein (GSCs-RFP) were orthotopic transplanted into the GFP-bone marrow reconstructed nude mice to establish a dual-fluorescent tracing model. Malignant transformation mesenchymal stem cells (imBMSCs) were cloned from xenografts. Cell phenotypes of transformed GFP+ cells were determined. siRNAs inhibited c-Met expression, imBMSCs invasion and angiogenesis ability was assessed. siRNA to inhibit the expression of Lnc-RNA Ftx, protein and mRNA expression of c-Met were evaluated.

Results: GFP+ cells bear characteristics of self-renewal and 100% tumorigenic rate, suggest their expression of malignant transformation. Inhibited Ftx can significantly reduce c-Met expression of imBMSCs, further inhibited invasiveness and angiogenesis capacity of imBMSCs. miR-342 had complementary base sequence with Ftx, suggest that miR-342 may be a target for oncogene c-Met. Reducing Ftx RNA expression can significantly inhibited c-Met protein level expression, but for c-Met mRNA and miR-342 expression level no obvious impact.

Conclusion: Host BMSCs can recruit into glioma microenvironment. Parts of BMSCs undergo malignant transformation, induced by GSCs. Our results on Lnc-RNA/miRNA competitive regulation may help to explore imBMSCs malignant transformation mechanism, and disclose the truth of glioma heterogeneity.

Keywords: Glioma stem cells, Mesenchymal stem cells, Malignant transformation, Dual-fluorescent tracing model, Tumor microenvironment

EP-0578 [Neuro-oncology » Basic Science]**Neuropsychological Signs in Patients with Arachnoid Cyst**

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Arachnoid cysts are benign, congenital lesions that are mostly found in the middle fossa. The prevalence of arachnoid cysts in the general population is 1-2%. The accepted indications for surgery are epileptic seizures, persistent headaches or findings of increased intracranial pressure. Review of the literature shows that beside these general

tendencies, in cases of cognitive, speech, psychotic disorders, the removal of concomitant arachnoid cyst can produce surprisingly good outcome. In the light of cases presented in the literature we review effects of arachnoid cyst surgery on neuropsychological disorders and suggest which neuropsychological tests need to be performed before and after surgery.

Keywords: Arachnoid, Cyst, Neuropsychology

EP-0579 [Neuro-oncology » Basic Science]

Sudden Scalp Swelling and the Case of Presence of Pancreatic Head Tumor with Vertebral Fracture

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The spine is one of the most frequently metastatic sites of tumor cases in the body. Spinal metastases are rare due to the structural characteristics of the pancreatic cancer and the short life expectancy. The most common metastatic sites of pancreatic cancer are the liver and peritoneum. In the presence of distant metastases, operation may not be considered because of the expected life span, even in these patients the operation may be contraindicated. In this regard, it is very important to determine the metastases. A 37-year-old male patient had a rapidly growing soft tissue mass in the left frontotemporal region for 2 months. The patient also began complaining of weakness in the back and left leg. In his examinations (Cranial CT and Lumbar MRI), there was a massive extradural mass that completely destroys the left frontotemporal bone and externally compresses the dura. On Lumbar MRI, L3 pathological burst fracture was present. The patient underwent extensive mass excision and craniectomy for the cranial lesion. Pathology was reported as high grade Neuroendocrine carcinoma pancreatic head tumor. Posterior stabilization and partial excision were performed to the lumbar region after a week. The patient was transferred to the medical oncology department for oncology therapy. As a result, rapidly growing masses, anywhere on the body as seen in our case, need to be evaluated for primary and metastatic malignancy. In later stages of this, vertebral metastases may be presented with neurological deficits. In this case, the stabilization surgeon should also be added to the tumor excision surgeon, taking into account the presence of instability

Keywords: Pancreatic cancer, Metastases, Scalp, Lumbar burst fracture

EP-0580 [Neuro-oncology » Basic Science]

Bitemporal Arachnoid Cyst Associated with Temporal Lobe Agenesis and Seizure

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Bilateral temporal lobe agenesis or hypogenesis is a rare congenital anomaly. This syndrome is often associated with the arachnoid cyst and abnormal CSF collection. The formation of arachnoid cysts in the temporal region is based on 2 theories. Arachnoid membrane malformation or partial agenesis of the temporal lobe are the main

reasons for arachnoid cyst formation. We would like to present a rare case of bitemporal arachnoid cyst associated with left temporal agenesis and right temporal hypogenesis. A 20-year-old male patient was admitted to the emergency room due to head trauma. The patient also had a headache for 3 months. Bilateral arachnoid cysts were detected at CT and MRI examinations. The size of the right cyst was 4 cm, and the size of the left cyst was 7 cm. These pathologies were accompanied by temporal lobe agenesis on the left and temporal lobe hypogenesis on the right. The patient was discharged to the emergency department without any pathology related to head trauma and was followed up. EEG examination was performed on the patient who had 4 seizures afterwards. In the EEG examination, a slow teta wave, which frequently appears in the right temporal region, was detected. The patient started to use levitiracetam and his seizures were under control. Surgical treatment was not considered because there were not any additional complaint. Temporal lobe agenesis associated with arachnoid cyst may cause EEG impairment and epilepsy. Surgical treatment may be considered in cases where medical treatment fails.

Keywords: Temporal lobe, Agenesis, Arachnoid cyst, Seizure

EP-0581 [Neuro-oncology » Basic Science]

The Clinical Course of Chiari Malformation Type I

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In our hospital from 2007 to 2015 were examined 84 patients with Chiari malformation type I in age from 11 to 67 years. The average age of -40.6 years. Among them were 49 women (58.3%), men - 35 (41.6%). The main group consisted of 20 patients who were operated on with the use of advanced methods of contact. The control group consisted of 60 non-operated patients who received conservative treatment.

The clinical picture of CM allocated 5 neurological syndromes:

- 1) Hypertension-hydrocephalic - in 76 (90.4%) patients,
- 2) Cerebellar - in 61 (72.6%) patients,
- 3) Pyramidal-bulbar syndrome - in 54 (64.3%) patients,
- 4) Radicular - in 47 (55.9%) patients,
- 5) Syringomyelic - in 23 (27.4%) patients.
 - The latent form of the disease has met 20% of patients. When it neurological signs were stable for several years (more than 3 years).
 - Slow-like progressive - 50%, in those observations, leading the symptoms grew in the period from 6 months to 3 years.
 - Fast-like progressive - in 30% of patients.

The clinical and anatomical aspects are two variants of the CM: 1st variant with compression of the medulla dorsal parts of the brain and spinal cord, and the 2nd option, in which there is a compression effect on the ventral and dorsal regions of the aforementioned brain structures. Compression only oblongata and upper segments of the spinal cord ventral departments found in other craniovertebral anomalies. These include: basilar Impression, platibasy and a number of others, which often require surgery of the anterior access.

Keywords: Chiari malformation type I, Clinic, Surgery

EP-0582 [Neuro-oncology » Basic Science]**Treatment Approach and Clinic Manifestations in Patients with Multiple Brain Tumors: A Case Report**

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Brain tumors are classified according to their degree, from low to high. The grade of a tumor indicates how the cancerous cells look under the microscope. Although two or more different types cranial tumors in the same patient are not common, sometimes it can occur. A 56 year old female patient applied to our clinic because of weakness in her right extremities for two months. In her neurological examination we determined that; her right arm muscle strength was 1/5, her right leg muscle strength was 3/5 and no other neurological deficits. No residual mass was found in the cranial MR of the patient who was operated 3 days after the hospitalization. One of the pathological results of the removed masses; was anaplastic oligodendroglioma, the other was psahmamatous menengioma. In her post-op third day neurological examination; it was recorded that her right arm muscle strength 4/5 and right leg muscle strength was 4+/5. In particular, brain tumors of similar structure can be detected in the same patient at the same time. The common point between menengioma and oligodendroglioma is Ki-67 / MIB-1 genetic codes. Whether or not they come from a common source, carry or not similar genetic traits, all brain tumors should surgically be removed when they are detected and clinically formed. Although more than one brain tumor in the same patient radyologically show the same features, treatment should be shaped according to postoperative pathological reports.

Keywords: Menengioma, Multiple brain tumors, Oligodendroglioma

EP-0583 [Neuro-oncology » Basic Science]**Simultaneous miRNA and mRNA Transcriptome Profiling of Glioblastoma Samples Reveals a Novel Set of OncomiR Candidates and Their Target Genes**

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Background: Although glioblastomas are common, there remains a need to elucidate underlying mechanisms behind their initiation and progression and identify molecular pathways for improving treatment. The aim of this study is to uncover data about miRNA and mRNA relationships in glioblastomas by combining mRNA and miRNA expression profiles, and to analyze data regarding glioblastoma versus healthy tissue, and IDH-wildtype versus IDH-mutant subtypes.

Method: Sixteen fresh-frozen glioblastoma samples and seven samples of healthy brain were analyzed with miRNA and whole transcriptome microarray chips. Candidate miRNAs and mRNAs were selected to validate expression in tissues. miRNA and target

mRNA relationships were assessed by inhibiting miRNA in glioblastoma cells. Analysis was done to determine correlations between selected molecules and clinicopathological features. Samples were also compared with regard to their IDH mutation status.

Results: With the whole transcriptome microarray, 1332 genes were found to be dysregulated, and 319 miRNAs were dysregulated according to miRNA microarray. The results were combined and analyzed with Transcriptome Analysis Console 3 software and the DAVID online database. Primary differential pathways included Ras, HIF-1, MAPK signaling and cell adhesion. OncomiR candidates 21-5p, 92b-3p, 182-5p and 339-5p for glioblastoma negatively correlated with notable mRNA targets both in tissues and in in vitro experiments. The potential clinicopathological effects of these molecules were revealed.

Conclusion: We present valuable integrated microarray analysis of glioblastoma samples regarding miRNA and gene-expression levels. Notable molecules and miRNA-mRNA relationships have been identified, some of which correlated with clinicopathological features in our cohort.

Keywords: Glioblastoma, IDH, Microarray, miR-21-5p, miRNA, Transcriptome

EP-0584 [Neuro-oncology » Basic Science]**Autonomic Reactions of the Brain During Posterior Cranial Fossa Surgery**

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Background: During operations on posterior fossa tumors (PFT) specific autonomic reactions (AR) occur. The 1-st type of AR - due to irritation of local centers or nuclei of cranial nerves relevant to the regulation of BP and heart rate. The 2-nd type of AR - resulting from hypoperfusion, with irritation of the midline structures, hyperecatecholaminemia, persistent arterial hypertension. Our aim is to evaluate the efficacy of dexmedetomidine in anesthesia in PFT operations.

Method: 80 patients underwent the operations on PFT. Induction of anesthesia: pipecuronium 0.1 mg/kg followed by rocuronium 0.6 mg/kg, propofol 1,5-2,35 mg/kg, fentanyl 3,54-5,9 µg/kg) + clonidine or dexmedetomidine. All patients were divided into 3 groups: group I (22 patients) were administered clonidine 1-2,63 µg/kg, in group II (38 patients) - dexmedetomidine of 1.05 to 2.33 µg/kg in group III (20 patients) - dexmedetomidine 0,54-0,95 mg/kg. Maintenance of anesthesia: propofol 2 -8.4 mg/kg/h, fentanyl 0.65 -2.08 µg/kg/h+ (in group I - clonidine 0,22-0,81 µg/kg, in group II - dexmedetomidine 0,21- 1.04 µg/kg/h in group III- dexmedetomidine 0,11 - 0.42 µg/kg/h). Monitoring: "NihonKohden" and "PICCO PULSION", "BISAspect".

Results: In group I, the 1-st type of AR - 14 patients (64%), the 2-nd type - 1 (0,05%). II group the 1-st type of AR - 24 patients (63%), the 2-nd type - 1 (0.03 percent). III group, the 1-st type of AR - 14 patients (70%).

Conclusion: Application of dexmedetomidine in anesthesia allows

to identify emerging autonomic response and could be applied during operations on posterior fossa tumors.

Keywords: Posterior fossa tumors, Autonomic reactions, Dexmedetomidin

EP-0585 [Neuro-oncology » Basic Science]

Coaxial 3D Bioprinting of Self-Assembled Multicellular Heterogeneous Tumor Fibers

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Three-dimensional (3D) bioprinting of living structures with cell-laden biomaterials has been achieved in vitro, however, some cell-cell interactions are limited by the existing hydrogel systems. To better mimic tumor microenvironment, self-assembled multicellular heterogeneous brain tumor fibers have been fabricated by a custom-made coaxial extrusion 3D bioprinting system, with high viability, high proliferative activity and efficient tumor-stromal interactions. Therein, red fluorescence protein (RFP)-expressing glioma stem cells (GSCs) and green fluorescence protein (GFP)-expressing mesenchymal stem cells (MSCs) were used for observing tumor-stroma interactions and self-assembly of tumor fibers. In order to further verify the sufficient interactions between tumor cells and stroma MSCs in tumor fibers, CRE-LOXP switch gene system which contained GSCs transfected with “LOXP-STOP-LOXP-RFP” genes and MSCs transfected with “CRE recombinase” gene was used. Results showed that tumor-stroma cells interacted with each other and fused, the transcription of RFP was higher than that of 2D culture model and control group with cells mixed directly into alginate, respectively. RFP expression was observed only in the cell fibers but not in the control group under confocal microscope. In conclusion, coaxial 3D bioprinted multicellular self-assembled heterogeneous tumor tissue-like fibers provided preferable 3D models for studying tumor microenvironment in vitro, especially for tumor-stromal interactions.

Keywords: Coaxial 3D bioprinting, Tumor fiber, Glioma stem cells, Mesenchymal stem cells, Cell fusion, CRE-LOXP gene

EP-0586 [Neuro-oncology » Basic Science]

Cognitive Dysfunction as a Presenting Sign of Glioblastoma Multiforme

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Glioblastoma (GBM) is a malign brain tumor that is more common in males aged 45-70 years. Clinically, GBM usually presents with a headache and is seen in more than 50% of the patients. Neuroradiological imaging methods are used to diagnose GBM. Here, we present a case of an elderly male patient with cognitive dysfunction as an initial clinical finding of GBM who was diagnosed by cranial magnetic resonance imaging (MRI). A 67-year-old male

patient was admitted to the hospital with a 3-months history of inwardness, self-talk in the evening hours, an inability to conduct daily activities, and a headache during the last week. In his past medical history, he had no other disease except for asthma. In his neurological examination; the patient was poorly cooperative, time and space orientation were impaired and plantar responses were bilaterally absent. Psychoparametric tests were compatible with the cognitive impairment. Cranial MRI revealed T1 isointense and T2 hyperintense lesions in the corpus callosum, posterior lateral ventricle, bilateral temporal regions. The patient was directed to the gamma knife treatment with the diagnosis of GBM. The patient and his relatives refused treatment and were followed up with symptomatic medical treatment. The most common symptoms of GBM are, headache nausea and vomiting, as well as slow progressive motor weakness, cognitive impairment and seizures are less frequently seen. Isolated cognitive impairment above the age of 65, primarily suggests dementia. Neuroradiology is the gold standard to detect the underlying organic pathology.

Keywords: Cognitive dysfunction, Glioblastoma multiforme, Magnetic resonance imaging

EP-0587 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Patients' Perspective on Awake Craniotomy for Brain Tumours: Single Institute Experience

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Background: Awake craniotomy with brain mapping is the gold standard for eloquent tissue localization. Patients' tolerability and satisfaction have been shown to be high; however, it is a matter of debate whether these findings could be generalized, since patients across the globe have their own cultural backgrounds and may perceive and accept this procedure differently.

Method: We conducted a prospective qualitative study about the perception and tolerability of awake craniotomy in a population of consecutive brain tumour patients between January 2009 and January 2017. 22 patients were interviewed.

Results: Patients' thoughts were grouped into five categories: (1) overall perception: no patient considered awake craniotomy a bad experience, and most understood the rationale behind it. They were positively surprised with the surgery; (2) memory: varied from nothing to the entire surgery; (3) negative sensations: in general, it was painless and comfortable. Remarks concerning discomfort on the operating table were made; (4) postoperative recovery: perception of the postoperative period was positive; (5) previous surgical experiences versus awake craniotomy: patients often preferred awake surgery over other surgery under general anaesthesia, including craniotomies.

Conclusion: Awake craniotomy for brain tumours was well tolerated and yielded high levels of satisfaction in a population of patients. This technique should not be avoided under the pretext of compromising patients' well-being

Keywords: Awake craniotomy, Surgery, Patients prospective

EP-0588 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Endoscopic Surgery Combined with Neuronavigation for Resection of Colloid Cyst with Small Ventricles: Case Report**

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Neuronavigation has been increasingly used in combination with endoscopy. However, clear indications for its application have not yet been defined. The aim of this case report is to demonstrate the place of neuronavigation in endoscopic resection of colloid cyst with small ventricles. A 37-years old female was admitted in our department for the management of colloid cyst of third ventricle. The patient gave a one year history of headaches. The neurological examination was normal. The initial MRI showed a large cyst placed posteriorly to the foramen of Monro, hyperintense on T1 and isointense on T2 weighted images with peripheral enhancement after injection of Gadolinium, there was no associated hydrocephalus. Therefore, pre-operative planning was mandatory before surgery. The neuronavigation was useful to target both lateral ventricles and colloid cyst per-operatively. A gross total removal with aspiration of the content of the cyst via endoscopic transchoroidal fissure approach was performed. The pathological examination confirmed the diagnosis of colloid cyst. Post-operatively, MRI didn't show any residual tumor and the patient had no major complaint after 9 months of follow-up. In endoscopic neurosurgery, neuronavigation is a useful tool in planning and realizing the approach and improving intraoperative orientation in selected cases, especially in colloid cysts with small ventricles.

Keywords: Colloid cyst, Neuroendoscopy, Neuronavigation, Small ventricles, Minimally invasive, Transchoroidal fissure approach

EP-0589 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Recovery of Hemiplegia-Aphasia After Laser Interstitial Thermal Ablation of Dominant Basal Ganglia Glioblastoma Multiforme**

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Laser interstitial thermotherapy (LITT) is a minimally invasive approach that uses thermal energy delivered by a laser to ablate tissue. Recent advances in this technology and near real-time MRI generated thermography have triggered renewed interest in its application for the treatment of brain pathologies. We are reporting the case of a 55 years old women with a large left basal ganglion biopsy documented glioblastoma multiforme (GBM), intolerant to adjuvant chemo therapy and refractory to radiation therapy, presenting with evolving aphasia-hemiplegia while on treatment. After 2 sessions of LITT and near total volumetric ablation, the patient resolved both aphasia and hemiplegia. The resolution of symptoms and the radiographic evidence of tumor control have persisted for 22 months. The role of tumor ablation is critically

linked to neurological function preservation. The small size of the LITT probe minimize normal anatomy distortion while reaching target. Laser heat redistribution relies on the applied laser power and the property of the surrounding tissue. Within the infra-red spectral range, white matter shows the lowest level of absorption and the shortest penetration depth while glioblastomas demonstrate higher level of absorption. The selectivity of the thermal injury to pathological tissue while maintaining a sharp thermal border with the normal tissue is critical in the activation of contiguous residual fascicular pathways and restoration of neurological function. Multiple questions remains in regard to the effect of LITT on the blood brain barrier, the immunological response, their synergies with radiation and chemo therapy and their combined effects on tumor control.

Keywords: Glioblastoma, LITT, Fascicular anatomy

EP-0590 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Application of Neuronavigation in Brain Surgery**

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Background: Neuronavigation has become an important tool in the surgical management of brain lesions. It provides intraoperative orientation, assists the surgeon in planning a precise and safe approach to the targetted lesion by defining the surrounding neurovascular structures and helps to avoid the eloquent areas of the brain during surgery. The aim of this study is to evaluate the application, the usefulness and the effectiveness of neuronavigation in the surgery of brain lesions.

Method: A prospective study of 173 patients undergoing neuronavigation assisted (NNA) neurosurgical interventions in the Department of Neurosurgery of the University Hospital of Blida (Algeria), between 2007 and 2012, is presented.

Results: There were 67 females and 106 males. The mean age was 34 years (6 - 74 years). The mean time of planning was 9,7 minutes. The procedures included NNA-Microsurgery in 87 cases (50,3%), NNA-Endoscopy in 50 (28,9%) and NNA-Biopsy in 36 (20,8%). The mean operative time was 147 minutes (54-230 minutes). The applications of neuronavigation were: gliomas in 81 cases (46,8%), metastasis in 26 (15%), meningiomas in 9 (5,2%) and other lesions in 57 (33%). An accurate histological diagnosis was possible in 96,53%. The neurological status was improved in 68,2%, unchanged in 19,7% and worsened in 12,1%. There was no mortality and the morbidity was related to the depth of the lesion, the localization in an eloquent area and the brain shift.

Conclusion: The neuronavigation provides important informations that can improve the safety and efficacy of brain surgery.

Keywords: Neuronavigation, Brain tumors, Image-guided surgery

EP-0591 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Results of Surgical Treatment of Extramedullary Tumors of the Cervical Spinal Cord**

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For the period of 2006 to 2016 in the clinic of neurosurgery we operated on 41 patients with extramedullary tumors of the cervical spinal cord. Of these, 26 are women, 15 are men; The average age is 41.8 ± 1.6 years. The localization of the spinal cord tumor was distributed: the upper cervical (C0-3) -17 patients, the lower-neck (C4-7) -24 patients. Of these, tumors were intradural in 37, extradural proliferation was detected in 4 patients. For diagnosis, MRI with contrast was used. On the McCormick scale, neurologic status at admission in 17 (41.5%) corresponded to grade II, in 21 (51.2%) of grade III-IV, and in 3 (7.4%) patients with grade V. All patients are operated microsurgically. Depending on the location of the tumor, various approaches were used: back access was performed in 15 patients, posterior-lateral in 25 patients, transoral access - 1 patient. Total tumor removal was performed in 38 (92.7%) observations, subtotal - in 2 (4.9%), partial - in 1 (2.4%) cases. Of all tumors, meningiomas were 21 (51.2%), neurinoma-19 (46.4%), chondroma in 1 (2.4%) cases. In the early postoperative period, a good result was observed in 35 patients, in 3 patients satisfactory, in 3 patients the neurological status remained at the preoperative level.

Keywords: Cervical, Spinal, Cord, Extramedullary, Tumor

EP-0592 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Results of Surgical Treatment for Metastatic Brain Tumors**

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73 patients with metastatic lesions of the brain were examined. The most frequent source of metastatic tumor was lung cancer - in 26 cases (45.6%). In 11 cases - breast tumors, 3 observations of the thyroid gland, stomach and melanoma, in 2 cases, a tumor of the kidneys and large intestine. In 23 (19.5%) patients, the primary source was not detected. All (73 observations) patients entered the hospital with the existing focal neurological symptoms, and more (50%) in a state of moderate severity, with predominance of general symptomatology. In 34 (80.4%) patients single metastases were revealed, in 39 (19.6%) - multiple, of which oligometastatic were (75%). All patients were operated on. In 84% of patients, the tumor was removed radically, 12% - subtotal, 4% - partially. In three cases, a lethal outcome was observed, which amounted to (6.5%) In 71.7% of patients, a significant regression of neurologic deficit was observed, (19.5%) were discharged in a satisfactory condition, a re-growth of focal neurological symptoms was observed in 8.8% of patients. The cause of death was progressive cerebral edema with a dislocation syndrome. The average life expectancy after surgery was increased to (5.1 ± 1.2) months.

Keywords: Metastatic, Brain, Tumor

EP-0593 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Outcome of Radical Surgical Resection of Craniopharyngiomas in 1054 Patients: Special Consideration for the Preservation of Hypothalamic Structures**

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Aim: To study the effectiveness of internal maxillary artery bypass surgery for the treatment of huge/dolichoectatic aneurysms.

Method: 64 patients with huge or dolichoectatic aneurysms, 41 males and 23 females; mean age is 44.13 years. Angiographic studies showed the aneurysms are located in cavernous sinuous segment of the internal carotid artery in 21 patients, the middle cerebral arteries in 17 patients, supraclinoid carotid artery in 14 patients, cervical and petrous carotid artery in 2 patients, basilar tip-posterior cerebral artery in 6 patients, basilar trunk in one patient, and vertebrobasilar artery in 3 patients. Surgical technique: Of the 64 cases, aneurysms without perforators were trapped after the bypass in 39 cases. In 25 cases, aneurysms connected to perforators were managed through proximal occlusion with distal bypass so the perforating arteries would still be perfused.

Results: Neurological outcomes were measured on the basis of Glasgow Outcome Score (GOS). Recovery rate to normal daily life after surgery in trapped aneurysms without perforators and reversal flow of the aneurysm with perforators was 28/29 (93.1%), and 23/25 (92%) respectively. In 47 patients with mean follow-up of 3.0 years (0.5-6.5), 41 patients had bypass grafts of proximal M2 segment of MCA and 6 had PCA bypass grafts. Of those, 50 patients had good outcome, 2 patients needed assistance for daily living, and 1 death occurred unrelated to surgery.

Conclusion: Huge /dolichoectatic aneurysms pose unique therapeutic challenges that require thorough surgical planning, individualized treatment strategies, and refined neurovascular techniques for successful outcome.

Keywords: Craniopharyngioma, Surgical resection, Pterional approach, Interhemispheric approach

EP-0594 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Intraoperative Ultra Sound in Low Grade Gliomas Surgery**

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Background: Tumor boundaries may often be difficult to define intraoperatively, particularly in low grade gliomas, and despite the advances made in neuroimaging neither magnetic resonance (MR) imaging provides precise determination of intraxial tumor margins. Precise localization of histologic margins of the tumor is crucial for surgical planning.

Method: Twenty patients with low grade glial tumors were evaluated with intraoperative ultrasound studies. There were 16 males and 4 females with an age range of eighteen to sixty years (median 35 years). All patients underwent preoperative MR images (1.5 Tesla Magnet).

Results: Positive correlation existed between both IOUS and T1 ($p < 0.001$) and IOUS and T2 ($p < 0.001$) volume estimates. There was a tendency for IOUS volumes to be larger than T1 volumes ($p = 0.07$). Although not statistically significant, IOUS and T2 estimates appeared similar ($p = 0.8$).

Conclusion: Low grade glioma represent a special challenge in glioma surgery. It is often difficult to differentiate tumor tissue from normal tissue visually. Therefore, ultrasound is a very useful intraoperative imaging modality to define borders of low grade gliomas.

Keywords: Ultrasound, Tumor boundaries, Surgical planning

EP-0595 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

A Rare Occurrence of Extradural Haemorrhage (EDH) in Adult Post Mayfield Head Clamp; A Case Report and Literature Review

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Mayfield head clamp has been associated with skull fractures, lacerations, air embolism and epidural hematoma in children. However, post clamping EDH occurrence adult is very rarely reported and discussed. Pin site generally contraindicated in patients below 3 years old and not recommended for child < 5 years old. 25yo gentleman, he is a non smoker and non alcoholic with underlying of left sphenoid wing meningioma. Initially presented with GTC with post ictal drowsiness on the September 2016 and underwent partial excision then. However, repeated scan on the December 2016 shows tumour recurrence with mass effect. Subsequently, he underwent re-craniotomy and tumour excision in January 2017. Post operatively, immediate CT Brain done in the brain suite shows right sided extradural haemorrhage. Patient underwent immediate right craniotomy and clot evacuation. Intra-operatively, there is no fracture line or punctured bone with intact dura noted and about 10cc of clots removed. Post operatively, patient recovered well and discharged home. There are a few risk factors for occurrence of EDH post Mayfield clamping such as coagulopathy, pre-existing hydrocephalus (causing reduced in calvarial thickness but more commonly seen in children), incomplete homeostasis of dura or brain mater and abrupt change in intracranial pressure (as seen in our case). Some articles have advise on preoperative skull thickness measurement with assistance of headrest to reduce the pressure applied by the Mayfield. In conclusion, post clamping EDH is a rare but preventable complication.

Keywords: EDH, Mayfield clamp, Rare

EP-0597 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Antero-Posterior Combined Surgery in Rare Retroperitoneal Giant L3 Schwannoma

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Schwannomas are peripheral nerve sheath originating benign natural tumors arising from schwann cells. Retroperitoneal localization for schwannomas is extremely rare(%3). The primary surgical approach for such tumors is total resection. We report a schwannoma case; giant, retroperitoneal extension originating from L3 nerve root. A 43-year-old female patient was admitted to our department with a cellulosic schwannoma pathology after excisional biopsy at another center. The patient's neurological examination was normal. On the lumbar-abdominal contrast-enhanced MRI examination of the patient, a mass lesion was observed in the vertebral compartment interior component 2x3x3 cm and the component psoas component 8x4x3 cm in size, extending from the right L3 nerve root into the right psoas muscle. The patient was operated on postoperatively in the first stage and then in the anterior approach plan in the presence of intraoperative neuromonitoring. All components of the kits were encapsulated in a single seantar total encapsulation with a two-stage surgical procedure. Postoperative contrast-enhanced MRI showed no enhancing tumoral lesions. The pathology result was compatible with the sells schwannoma WHO Grade 1. Two-stage surgical procedure in such cases should be preferred in order to prove that the surgical field is adequate and to avoid the complications that may occur in neighboring anatomical structures during resection of these circumferentially circumscribed tumors. Because there are many different applications and options mentioned in the surgical approach, urgent surgical intervention is needed in such cases. Elective surgery planning should be made clear both surgical procedure and approach selection, both preoperative evaluations to be performed,

Keywords: Giant, Schwannoma, Approach, Combined, Lumbar

EP-0598 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Tumors of the III-rd Ventricle Region: Surgery Results and Sequelae Prediction

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Background: The treatment of the IIIrd ventricle tumors is still difficult problem for neurosurgeons.

Method: The analysis was made of the results of complete examination and surgical treatment of 348 patients with the IIIrd ventricle tumor, who underwent treatment at the State Institution "Institute of Neurosurgery" in period from 1993 to 2016; 181 male

and 167 female. Surgery: total removal – 94 patients ($\approx 42\%$), gross total removal – 42 patients ($\approx 19\%$), partial removal – 74 patients ($\approx 34\%$), biopsy – 8 patients ($\approx 4\%$). Shunting operation was done in 129 patients without tumor resection. Histological examination was done in all patients, who underwent tumor resection (219 patients – 63%).

Results: Total excision of tumors, regardless of their localization, promoted a better life quality for 80% of patients, gross total resection – for 57%, partial removal – for 60% ($p=0.02$). 85% of patients with the IIIrd ventricle tumor lived 5 years after surgery, 83% of patients – 10 years. Favorable predictive factors in the treatment are the following: total tumor excision and quality of life (Karnofsky index) score more than 70 points. Unfavorable factors for the surgical Results: localization and histological structure of the tumors and non radical removal of the neoplasm. The most negative factors: invasive tumor ($p<0.01$) partly excision of the tumor ($p<0/01$), presence of craniopharyngioma ($p<0.001$).

Conclusion: The surgical treatment depends on the patient condition, topographo-anatomic correlations with nearest brain structure, tumor growth and histological tumor properties.

Keywords: Third ventricle tumor, Surgical treatment, Life quality, Predictive factors

EP-0599 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Mid Line Skull Tumors, Affecting Superior Sagittal Sinus-Surgical Challenges

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Many variety of tumors could involve the skull bone (primary, metastatic, benign, or malignant); however, very few may occur strictly over the midline convexity of skull. Some may affect venous blood flow of superior sagittal sinus, depending on their rate of tumor growth. Three challenging cases are presented. 1-Rare case of osteoblastoma over the torcula, (headache, visual s symptoms, papilledema, VI nerve palsy). 2- Rare case of metastatic liposarcoma involving midsagittal sinus with partial occlusion (headache and visual blurring). 3- A huge atypical (grade2) meningioma over the vertex.

Case 1, the tumor over the venous confluences removed easily, without any complications, with complete resolution of symptoms
Case 2, complete en-block resection of tumor, with sacrifice of mid-sagittal sinus, without any neurological sequelae.

Case 3, subtotal resection, followed by radiotherapy.

Anterior 3rd of the superior sagittal sinus could be sacrificed (if necessary), without major consequences. However, whenever mid or posterior portion of the sinus is involved, interruption of venous flow could pose very serious complications. Occasionally, chronic compression of superior sagittal sinus may force increasing collateral venous return, in which case one may attempt a complete resection of the lesion, with sacrifice of part of the sinus, as in our second case. In the region of torcula, however, one should be very careful not to damage the confluence of sinuses.

Keywords: Skull tumors, Superior sagittal sinus, Venous flow

EP-0601 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

The Use of Intraoperative Ultrasound in the Intracranial Tumor

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Ultrasound has been used as a diagnostic tool for nearly 40 years. In the practice of neurosurgery, the use of ultrasound have become widespread in the intraparenchymal masses that can not be seen from the surface because of their ability to determine location and to determine the amount of remaining tissue. Therefore ultrasound provides opportunity for protecting healthy tissue and reducing complication rate. A 80-year-old man presented with headache and gait disturbance. A contrast-enhanced computed tomography and magnetic resonance imagining scans revealed a left temporal tumor with cystic and solid components. Surgical resection was planned for the tumor tissue. After craniotomy, ultrasound was used to determine the exact location of tumor. Cystic and solid components of the tumor were detected. Gross total resection was performed. After resection, we confirmed with ultrasound for residual tumor tissue. The use of ultrasound intraoperatively provides an advantage of real time imaging. Therefore ultrasound was facilitated and shortened our operation. We recommend intraoperative ultrasound with easy access and use.

Keywords: Intracranial tumor, Ultrasound, Intraoperative imaging

EP-0602 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Colloid Cyst of Third Ventricle: Report of 11 Cases with Transcallosal Transforaminal and Transcolumna Fornicis Approach and Clinical, Radiological Features

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Aim: To evaluate, clinical findings, radiological evidences, operation technique, complications and outcome in third ventricle colloid cysts and to assess the most safe and easy surgical approach for the treatment.

Method: 11 cases of third ventricle colloid cyst who underwent transcallosal operation between 2009-2017 were analysed retrospectively. In 10 of these cases cyst was visualised through foramina monroe and in nine of them cysts were easily removed. We additionally applied posterior inter fornical approach to the 10th case. In the 11th case the cyst could not be visualised through

foramina monroe and was found to be buried in paranchyma between foramina monroe and commissuria anterior. The cyst was removed through the incision performed to the columna fornicis lying on the cyst. Up to our knowledge third ventricle colloid cyst at this location is not reported in literature.

Results: There were 7 males and 4 females. The age range was 6 to 70 years. The most common preoperative symptom was headache, it was episodic, and together with nausea and vomiting in 3 of them. All of the patients were diagnosed with MRI, 5 patients also underwent CT examination. We detected hidrocephalus in 8 cases.

Conclusion: Transcallosal, transforaminal and interforaminal approach which enables total resection with low complication and recurrence rate can be estimated as the most reliable procedure.

Keywords: Transcallosal transforaminal, Transcolumna fornicis, Colloid cyst, Third ventricle, Craniotomy, Surgery

EP-0603 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Local Experience with Repair of Superolateral Orbital Wall: Fat Sandwich Technique

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Background: Anterior skull base meningiomas involving the superior and lateral orbital wall are challenging regarding clinical presentation, surgical technique and functional outcome. One potential morbidity is sunken temporal fossa after the surgery with possible occurrence of pulsatile enophthalmos. Hence reconstruction of the base is of great importance both for functional and cosmetic outcome. The aim of this study to evaluate outcome of double fat sheet technique plus vascularized peri-cranial flap (Sandwich technique) in anterior skull base reconstruction after extensive orbital drilling.

Method: In twenty nine cases of meningiomas involving superior and/or lateral orbital wall or cases requiring roof orbitotomy for high skull base approach during the period of 2011 to 2016 we applied a simple method for repair of dura, filling defect left by extensive bone drilling, and create a cushioning barrier between the orbit and frontal dura. A double fat sheets sandwiched between supportive vascular plans; first filling layer based on temporalis muscle and periorbita, supportive vascularized pericranial flap, and lastly a second overlying sheet dependent on pericranium and dura vascularity.

Results: Good cosmetic early results were obtained in all cases. No pulsatile enophthalmos encountered, overfilling of temporal fossa with no clinical relevance in one case, three cases suffered late hollowing of temporal fossae that needed esthetic intervention.

Conclusion: Supero-lateral orbital walls reconstruction can be done effectively, with good cosmesis, using our autologous double fat sandwich technique. In addition of being cost effective, this technique supports water tight dural closure.

Keywords: Orbit wall, Skull base, Reconstruction, Fat graft

EP-0604 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Transseptal Submucosal Transsphenoidal Hypophysectomy with Preservation of Vital Nasal Structures

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Background: Endoscopic transsphenoidal approach is the less traumatic route to the sella turcica, avoiding brain retraction, and also permitting good visualization, with lower rates of morbidity and mortality. Although mortality of pituitary surgery decreased by advances in surgical techniques morbidities such as synechia formation, anosmia, bleeding, nasal septal perforations, drying, and incrustation due to traumatization of the nasal structures such as septum, nasal mucosa, and middle concha are the current problems in pituitary surgery. Here, the authors described an endoscopic transseptal submucosal transsphenoidal hypophysectomy with minimal damage to normal anatomy and physiology and discussed advantages of this technique.

Method: The authors performed endoscopic transseptal submucosal transsphenoidal hypophysectomy to 37 patients and evaluated intraoperative exposure and postoperative results.

Results: None complication was noted during the surgery. One patient had nasal fistula. It was not noted other complication during postoperative period with endoscopic transseptal submucosal transsphenoidal hypophysectomy.

Conclusion: Endoscopic transseptal submucosal transsphenoidal hypophysectomy is a safe technique, provide one good field's view during the surgery, even in reoperations, and decrease morbidities like a synechia formation, anosmia, bleeding, nasal septal perforation, dry and incrustation with preservation of important nasal structures as turbinates and mucosa, keeping olfactory function and some sinusal quality of life.

Keywords: Endoscopy, Submucosal transsphenoidal, Hypophysectomy

EP-0605 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Three-Dimensional (3D) Transsphenoidal Endoscopic Surgery for Skull Base Tumors (Our Experience)

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Background: Endoscopic endonasal transsphenoidal approach is a less traumatic minimally invasive approach for surgery on the skull base. However, it has its problem, such as the two-dimensionality of the surgical field. Using three-dimensional (3D) endoscopic technique provides adequate vision with satisfactory surgical manipulation in the depth of surgical field. The aim is to increase the positive results of the surgery of the skull base using 3D endoscopic transnasal transsphenoidal approach.

Method: We used three-dimensional (3D) endoscopic endonasal

transsphenoidal surgery for removing the tumors of the skull base. We analysed our experience in 10 patients aged between 36 to 66 years. In all cases we used a rigid 3D endoscopes "Karl Storz" with 00 and 30O visual angle.

Results: The most frequent lesion was pituitary adenoma - 8 (80 %) patients. Among other tumors, histologically were craniopharyngioma (1) and chordoma (1). Total removal of the tumors was achieved in 8 (80 %) cases. Post-operative complications were present in 2 cases. In 1 case was diabetes insipidus. In 1 case was hypopituitarism.

Conclusion: The use of 3D endoscopy allows to improve treatment results and decrease the complication rate by depth perception of the surgical field.

Keywords: Endoscopic endonasal transsphenoidal surgery, Three-dimensional (3D) endoscopic technique, Skull base, Pituitary adenoma

EP-0607 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Piezosurgical Device for Mini Demolitive Craniotomies in Brain Tumors

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Background: Piezoelectric surgery represents an innovative surgical technique to perform a safe and effective osteotomy or osteoplasty that contrasts with the traditional bony tissue management methods using rotating or perforating instruments, with bone tissue loss and possibility of vascular and soft tissue injury. The aim of this study is to evaluate safety and feasibility of craniotomies using an ultrasonic scalpel that allows a selective cut of only mineralized structures avoiding damages to the vascular, dural and parenchymal structures.

Method: A case series of 317 patients undergoing elective cranial surgery from 2013 to 2016, in which the craniotomy was achieved using a piezoelectric device, was retrospectively reviewed.

Results: Supratentorial craniotomies were performed in 179 patients, the remaining 138 were subtentorial ones. Patient mean age was 55.3 years (ranging from 01 to 81). Among them, 73 patients were affected by vestibular schwannomas, 104 by meningiomas. The ultrasonic scalpel was used to gain access to skull base, to fashion a parasagittal craniotomy over underlying dural sinuses and, in 26 case of vestibular schwannomas surgery, to open internal acoustic meate. In our series, no parenchymal tissue damages or dural veins injuries were reported, also in elderly patients. We observed minor dural tear in 21 cases (0,06%), requiring surgical sutures.

Conclusion: This report illustrates an alternative technique to perform craniotomy for brain tumor surgery which employs an ultrasonic bone dissector to safely achieve bone removal. This surgical technique appears to be safe and complication free with excellent cosmetic results

Keywords: Brain tumor, Craniotomy, Dural sinuses, Piezosurgery, Ultrasonic surgery

EP-0608 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Acute Hydrocephalus and Anton Syndrome Secondary to Colloid Cyst of the Third Ventricle

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Colloid cysts are congenital benign intracranial lesions, the up portion of the third ventricle. They account for 0.2% to 2% of all intracranial tumors and represent 15% to 20% of intraventricular tumors. Anton's syndrome is a cortical blindness in which the occipital cortex, a site of vision integration, is bilaterally affected. These patients deny their own blindness. 37 years-old female patient presented with headache, sudden onset, oppressive type - 3 days afterwards stuporous, indifferent to the environment, leading to emergency service, nausea and vomiting on 3 occasions with food. Glasgow sudden neurological deterioration 5 points (M: 3 - V: 1 - O: 1), simple skull CT - in which acute hydrocephalus is observed - cyst in the 3rd ventricle, VP shunt is placed. In the postoperative course, she presented with cortical blindness, she argued to observe the objects and describes characteristics of the same as of the people, he gets up and tries to stroll around with the objects and stumbles on several occasions. The patient denies her own blindness. Neuroendoscopy is performed for resection of the lesion. Colloid cysts of the third ventricle are usually diagnosed when symptoms of intracranial hypertension secondary to obstructive hydrocephalus are evident, although they may remain asymptomatic and may be found incidentally.

Keywords: Colloid cyst, Intraventricular tumor, Neuroendoscope, Anton syndrome

EP-0609 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Removal of an Intraventricular Ependymal Cyst Presenting with Tremor: Case Report

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Intraventricular ependymal cysts (ECs) are rare, histologically benign neuroepithelial cysts. Most of these cysts are clinically silent and discovered incidentally. Rarely, they become symptomatic, leading to obstruction of the cerebrospinal fluid circulation. ECs located inside the ventricles may manifest with signs of increased intracranial pressure. A 32-year-old woman presented with a 6-year history of tremor affecting her left hand. In the last month, she had been experiencing headache as well, and the tremor of the left hand was affecting her quality of life. The patient demonstrated a fine resting and intention tremor of the left hand and a voice tremor. Magnetic resonance imaging revealed a large cystic, nonenhancing lesion within the right lateral ventricle. The fluid within the cyst was isointense to cerebrospinal fluid on all sequences. Because of the

rapid progression of her symptoms and no response to medication, surgical decompression of the cyst was considered. The cyst was removed by an endoscope-assisted microsurgical technique. Her postoperative course was uneventful. A marked reduction in her tremor was noted in the immediate postoperative period. Histopathologic diagnosis was of an EC. During the follow-up period, the patient's tremor, although still present, had improved dramatically. At 6 months postoperatively, she could hold a drinking glass without spilling. This is a unique case of an intraventricular EC that manifested with tremor, which improved by endoscope-assisted microsurgical removal of the cyst. This case also supports the important role of endoscopic surgery in the treatment of intraventricular cystic lesions.

Keywords: Endoscopic surgery, Ependymal cyst, Lateral ventricle, Tremor

EP-0610 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Utility of Neuronavigation, and Transoperative Ultrasound for the Resection of Tumors in Eloquent Areas During an Awake Craniotomy

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The neuronavigation systems guided with ultrasonography in real time allows the surgeon to avoid critical structures and perform a minimally invasive surgery, among the advantages versus the conventional procedure are more accuracy, smaller incision and less time of surgery, also diminishes the length of stay in ICU and in hospitalization. We present a clinical case of a female patient who underwent surgery with an awake craniotomy, aided with neuronavigation system and transoperative ultrasound for the resection of a low grade glioma in eloquent area. We present the case of a 32 year old female patient, with a 6 month history of headache, dizziness and vomit, and then presented tongue fasciculations in her right side and left hemiparesia. In the CT scan and MRI we found an hyperdense/hyperintense lesion in the right frontal lobe. We performed an awake craniotomy, the surgical approach was guided with the neuronavigational system (sonowand invite®) and the resection with the transoperative ultrasound. The macroscopical resection of the tumor was about 90%, and the patient had a well postsurgical course, being 6 month free of relapse of the tumor, and no neurological deficit added. The neuronavigational systems aid the neurosurgeon to perform a more precise tumor resection with better outcomes and better cosmetic results.

Keywords: Neuronavigation, Eloquent areas, Awake craniotomy

EP-0611 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Supracerebellar Infratentorial Approach for Resection of Pineal Region Epidermoid Tumor

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In this report we present case of a 15-year-old male who presented with five year headache, double vision and a 20-month history of progressive ataxia. Workup with MRI scans showed a 3 cm diameter epidermoid tumor at the pineal region, hypointense T1-weighted with no contrast enhancement, hyperintense T2-weighted. Diffusion weighted images showed a bright at the pineal region. Under general anesthesia, the patient was placed in a sitting position. We performed a suboccipital craniotomy crossing the transverses and sagittal sinuses. Then the dura was opened in a very shallow U. Arachnoid adhesions were dissected and freed with the sharp dissection and we came to the very end of the superior vermis of the cerebellum. We visualized precentral vein and coagulated and cut with the microscissors. We visualized both internal cerebral veins and basal veins of Rosenthal and then dissected them. Then further arachnoid dissection was performed to free all these vascular structures and dissected the cystic mass. There were very minute smaller vessels in the wall of the mass. These were coagulated and then the mass was opened with the microscissors and a characteristic "pearly tumour" was encountered. Then we deflated the mass and performed by carefully dissection using blunt and sharp dissection from internal serebral vein. Final inspection revealed no residual epidermoid tumor. Then after this we visualized posterior 3rd ventricle and hemostasis was established. Bone flap was replaced. The patient tolerated the procedure well and there were no post-operative complications. The patient was discharged home on postoperative day 3 and made an excellent recovery.

Keywords: Supracerebellar infratentorial approach, Pineal region, Epidermoid tumor

EP-0612 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Neurosurgery of the Intracranial Potential Spaces

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The refinement of neuroendoscopic technique has resulted in safer and effective way of treating various lesions located within the intracranial spaces which allows direct visualization of the surgical corridor, meticulous handling and assessment of floor of the cerebral ventricles and its related structures through a keyhole entry point. Pure Neuroendoscopic technique require cavity and working space to look around and to allow manipulation of instruments within its working channel. The intracranial potential spaces applicable to endoscopic Neurosurgical procedures can be divided into natural anatomical spaces and true potential spaces which can be expanded by disease process or injury. Pathological obstruction along CSF pathway in the brain gradually resulted in hydrocephalus and dilatation of the potential spaces of CSF, particularly ventricles and makes it favorable as a medium for surgery. For the purposes of endoscopic procedures, obstructive Hydrocephalus is further divided into 5 types based on the radiological features and side of the ventricular dilatation i.e.1) Monoventricle hydrocephalus, 2) Biventricle Hydrocephalus, 3) Triventricle Hydrocephalus, 4) Tetra ventricle Hydrocephalus and 5) Multiloculated Hydrocephalus. The concept of endoscopic Neurosurgery within intracranial potential spaces will be elaborated and demonstrated through various

pure neuroendoscopic techniques from basic to advanced and navigation guided such as contralateral transventricular endoscopic disconnection of hypothalamic hamartoma in retractable seizures, removal of intraventricular and paraventricular tumours, benign cyst, endoscopic lavage in infective hydrocephalus and removal of bullet fragment in gun shot head injury.

Keywords: Pure neuroendoscopy, Key hole neurosurgery, Intracranial potential spaces

EP-0613 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

The New Neurosurgical Method of the Brain Echinococcus Cyst

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On the basis of the above presented purpose in the our clinic for the period of 1980 – 2016 we have scientifically evaluated case histories of the 113 patients with echinococcus of the brain. According to the methods of surgical treatment used all patients were divided into two group; there were 38 patients surgically treated by the use of ordinary method in the first group and there were 75 patients surgically treated by the use of the new proposed method in the second group. Among evaluated patients all of them were at the age from 3 to 40 years old, 54,3% of them were men and 45,7% of them were women. After estimation of the echinococcus cyst between cyst and brain tissue with care and use of spatulas we have entered in a half distance sterile surgical glove full of physiologic solution then we rhythmically compressed it and as a result hydrostatic pressure has been found. After it pressure has been increased in the area of hand and as the result of this echinococcus cyst has been gradually separated from the brain tissue and fully removed. As a conclusion we could say that by the use and the help of the new proposed method of the surgical treatment during surgical operation of the echinococcus cyst we have removed solid cysts without any injuries of the brain tissues. The effectiveness of the hew method has been presented decreasing recurrences of the disease, purulent-septic complications and lethal outcomes of the diseases.

Keywords: Echinococcus, Surgical glove, Cyst

EP-0614 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Outcomes and Factors Affecting the Recurrence of Central Nervous System Chondrosarcomas: A Serial of Seven Patients

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Background: Chondrosarcomas are the most common second primary bone tumor. They rarely originate from brain parenchyma as well as dura. They are rare, slow-growing but locally aggressive lesions. The current study presents the surgical outcomes of patients with chondrosarcomas involving central nervous system.

Method: The patients operated between the years 2008 and 2015, for chondrosarcomas at neurosurgery department in BRSHH institution. After craniotomy/laminectomy performed using high speed drills under microscope to reach the lesions then gross-total/subtotal removal had been performed. The mean follow-up period (survival rate) was 67.9±28.1(41-96) months. The mean age of the patients was 44.5±22.5(17-69) years.

Results: Six (2women,4men) were primary and one man had metastasis of humerus metastasis which affected C3. Three patients underwent STR (66-M, 69-F and 40-M). All of them were resected totally for recurrence after (12, 18 and 48 months, respectively). Other three patients underwent GTR, while there one (suprasellar tumor) was underwent STR (progressed after 40 months and sent to receive gamma knife). Their locations were cervical (2), thoracic(1), lumbosacral (1), temporal (1), parietooccipital (1) and suprasellar (1). The most common complaint was headache (100%) for cranial group, weakness and loss of sensation for spinal group. The mean clinical course was less than 6months 3.4±1.8(1-6) months. Morbidity rate was 22.2%. The recurrence rate was 57.1%. 5-year overall survival rate was 100%.

Conclusion: Spinal chondrosarcomas are eroding bones and caused abundant bleeding. That makes their surgery more difficult. Extension of resection (GTR:P=0.014), age<21.5 (P<0.001), intracranial location (P=0.014) and low grade (P=0.002) were the factors reducing recurrence rate.

Keywords: Intracranial chondrosarcoma, Primary bone tumor, Spinal chondrosarcoma, Recurrence

EP-0615 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Yellow Fluorescence [Y 560] Microscope use in Stereotactic Guided Biopsy of the Brain Space Occupying Lesions: Initial Experience

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Background: Stereotactic biopsy of the SOL are very useful in deep seated and eloquent areas of the Brain. This will help in diagnosis and followed by treatment. Some times biopsy material is inadequate or non representative of the lesions. Use of Y560 microscope will help in confirming the nature of the lesion.

Method: This study has been done at Kovai Medical Centre hospital, Coimbatore during May 2016 to January 2017. This centre uses Y560 fluorescence integrated microscope [Zeiss Pentero] for intra cerebral tumours approximately 50 surgeries every year. We have used this microscopic confirmation for stereotactic biopsy of 3 different type of SOL during the study period. Stereotactic Biopsy of the lesions done as per standard procedure followed by confirmation under the microscopic filter. yellow fluorescence staining whether bright or dull will be marked and sent to HPE. Correlation to the brightness and HPE confirmation studied.

Results: All 3 biopsies were positively identified by the Yellow 560 fluorescence and correlated well with histopathology.

Conclusion: This method will help in identifying the tumour tissue in real time and confirms the correct biopsy specimen. This will avoid negative tumour tissue and there by repeated procedures.

Keywords: Yellow 560, Stereotactic biopsy, Yellow fluorescence

EP-0616 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

The Basic and Advanced Neuroendoscopic Techniques in Intraventricular Tumor Surgery

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Endoscopic surgery in the neurosurgery has been developed for the biopsy and tumor resection. We reviewed my own consecutive 23 cases located in the ventricles. All case were indicated for the biopsy, possibly tumor resection. There were 7 pineal tumor, 10 intraventricular tumor, 3 supra-sellar tumor, and 2 mid-brain tumor. One of 22 cases were unable to diagnose. The pathology were 6 glioma, 5 germinoma, 2 PCNSL, one pineal teratoma, 2 metastatic tumor. Basic techniques are well-known. In short, a small burr hole was made more anterior, if the lesion seated in the pineal and large massa intermedia. Transparent plastic neuroendoscopic sheath was placed through the Foramen Monro to see the floor of ventricle or pineal lesion. Endoscopic third ventriculostomy was done before biopsy to avoid poor visualization. I preferred a rigid endoscopy, but some cases were used flexible one simultaneously. The hole of endoscopy was embed by gelatin sponge. The cases without hydrocephalus is difficult but possible. Stereotactic frame or neuronavigator were adopted. In the vascular rich tumor, hemostasis was difficult. Pressure irrigation and electrical coagulation were needed. The compression by endoscopy shaft could be effective. The total tumor removal was achieved in two soft tumor, which were central neurocytoma and colloid cyst. It was not expected in all cases. In conclusion, the endoscopic biopsy is safe and reliable to diagnose. We will demonstrate our surgical videos.

Keywords: Endoscopy, Hemostasis, Tumor

EP-0617 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Colloid Cyst of the 3rd Ventricle: Technical Notes for Safe Endoscopic Removal

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Colloid cysts are well known as non vascular lesions, and had fragile attachment to the roof of the 3rd ventricle, its strong relation to the choroid plexus confirmed surgically besides its pathological origin that still a matter of debate. The microsurgery usually had good results with some complications, previous endoscopic treatments had less complication with less good results for total resection, during the endoscopy treatment many safety signs can be detected to try this en block removal with this technique we had booth the lass and acceptable complications with very good results for

complete resection proved by long term follow up. If we could not find these safety signs, then we try capsule puncture and de bulking the contents of the cyst, then capsule removal. Endoscopic treatment should be done as first line treatment for all symptomatic cases of colloid cysts, and it will be successful in high percentage to perform the total resection with less complication, and just the cases that we could not remove by endoscope should be send for microsurgery. Endoscopy is burr hole surgery and can be done as an urgent procedure which we need in one third of all symptomatic cases to avoid deterioration, and this is totally different issues in the microsurgery in this points in addition to its lower complications.

Keywords: Colloid cyst, Third ventricle, Endoscopy

EP-0618 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

A Suprasellar Colloid Cyst - Neuroendoscope Technique

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Colloid cysts (CCs) are rarely found in the sellar-suprasellar region. Differential diagnosis of CCs is more challenging in this region because many other cystic lesions may locate or invade sellar or suprasellar structures. We present a large and unusual case of sellar-suprasellar CC with extension into the suprasellar, interpeduncular, and prepontine cisterns. This is the first case of sellar-suprasellar CC treated with an endoscopic transsphenoidal approach. A 33-year-old woman presented with a 1-year history of recurrent headaches. Her headaches had been unresponsive to medical treatment for the last 2 weeks. She had normal neurologic and ophthalmologic examinations. Neuroradiologic studies showed a large cystic sellar lesion with extension into the suprasellar, interpeduncular, and prepontine cisterns. The lesion did not show any enhancement, not even in the cyst wall. Her hormonal status was also normal. The cystic lesion was totally resected via a purely endoscopic endonasal approach. There were no complications, and the patient was recovered completely with improvement of her headache. Pathology was consistent with a CC. At 6-month follow-up, magnetic resonance imaging did not show any evidence of the residual or recurrent lesion. Although rarely found in this location, CC should be considered in the differential diagnosis in patients who present with a sellar-suprasellar cystic lesion. Additionally, sellar-suprasellar CC would be a good candidate for the endoscopic endonasal approach.

Keywords: Colloid cyst, Endoscopic endonasal approach, Sellar region

EP-0619 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Compression of Pons due to Hemostatic Matrix After Pure Endoscopic Transsphenoidal Narrow Transclival Approach for a Giant Skull Base Cordoma. No Bleeding!

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Hemostatic matrix with its gelatinous granules is widely used for preventing bleeding and it has been recommended to be removed by gentle irrigation. Bleeding is an important problem in endoscopic endonasal procedures for deep skull base malignancies. We present a 55 years old male who had a giant cordoma coursing anterior skull base to inferior clival region. A pure endoscopic transnasal transsphenoidal narrow transclival approach (diameter: 0.6cm) had been performed in order to prevent cerebrospinal fluid fistula. A total removal of the tumor had been achieved. Hemostatic Matrix was used to prevent brainstem venous plexus bleeding but although it has been recommended to be removed by gentle irrigation Hemostatic Matrix had not been removed in order to maintain hemostasis. Postoperative CT scans revealed with excessive compression on pons and the patient suffered temporary brainstem symptoms. Narrow transclival technique for removing cordomas is very useful for skull base reconstruction but makes it harder for hemostasis.

Keywords: Chordoma, Transclival, Endoscopic, Hemostatic matrix, Compression

EP-0620 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

The Role of Postoperative Nasal Care in Endoscopic Endonasal Skull Base Surgery, Review of Related Articles and Our Practice

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Aim: To evaluate the role of postoperative care in improving the sinonasal symptoms induced by the manipulation of nasal mucosa after endoscopic endonasal approach (EEA) which may last until the healing process is completed and the nasal function is restored.

Method: After 10 years of practicing endoscopic endonasal skull base surgery, a prospective study was conducted from February 2011 to December 2014 on 47 patients with pituitary adenoma living in dry climate areas that were candidate for EEA and received reconstruction with nasoseptal flap. The patients were asked to irrigate their nose with saline solution and use a paper mask during the first postoperative month. Self-reported Sinonasal Outcome Test 22 (SNOT-22) Questionnaire was completed preoperatively and 1, 3, 6, and 12 months postoperatively.

Results: The average use of paper mask in these patients was 10.09±6.06 hours per day and 36.38±25.13 days in total. Patients who used nasal paper mask for more than 100 "hour-days" showed a better SNOT-22 scores at 1st (p=0.04) and 3rd (p < 0.001)

postoperative months. The data related to postoperative care in endoscopic surgeries were reviewed in Medline and presented along with our routine practice.

Conclusion: Saline sprays and irrigation are used in postoperative period. The use of nasal paper mask in dry environments can also help in maintaining the humidity inside the nasal cavity, thus leading to decrease in sinonasal symptoms in the patients undergoing EEA. The effect needs to be evaluated in other nasal surgeries

Keywords: Postoperative care, Endoscopic endonasal approach, Sinonasal, Quality of life, Skull base

EP-0621 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

First Case of Primary Sellar/Suprasellar Intraventricular Ewing Sarcoma: Case Report, Operative Video and Review of Literature

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Intracranial Ewing Sarcoma (ES) and peripheral primitive neuroectodermal tumors (pPNETs) are extremely rare and poorly differentiated neoplasms. Recent immunohistochemical and cytogenetic findings support the possibility of a unique nosological entity. Primary intracranial localization of this tumor is extremely rare: a small number of cases are reported in the literature, with only a part of them confirmed by genetic studies. We report the case of 12 year-old-patient affected by sellar-suprasellar mass with intraventricular extension that in all its features mimics a transfundibular craniopharyngioma. The patient underwent to endoscopic endonasal transtuberulum approach with complete resection of the lesion six days after ventriculo-peritoneal shunt for acute obstructive hydrocephalus. Histopathological and genetic examinations resulted for ES/pPNET. In fact, the diagnosis was confirmed by detection of a rearrangement of the EWSR1 gene by fluorescent in situ hybridization (FISH) and identification of the diagnostic t(11;22) translocation by reverse transcription-polymerase chain reaction RT-PCR. Twelve months after tumor resection followed by adjuvant chemotherapy, the patient remained in complete clinical remission with no radiological evidence of tumor recurrence. This case was illustrated by surgical video. To our knowledge, this is the first case of primary intra/suprasellar intraventricular ES/pPNET, confirmed by molecular genetic analysis. Extensive investigations, including pathological, immunohistochemical and genetic studies, are needed for the differentiation of these tumors from other more common sellar/suprasellar tumors. Finally, our case highlights that an interdisciplinary therapeutic approach is mandatory to guarantee a favorable outcome.

Keywords: Ewing sarcoma, Sellar/suprasellar tumor, Endonasal transtuberulum approach

EP-0622 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**The Modified Lateral Supraorbital Approach: Technical Note**

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Lateral supraorbital approach is a simpler and quicker method than pterional approach. It provides a more anterior projection when compared to the pterional approach. There are some minor differences of the modified lateral supraorbital approach when compared to lateral supraorbital approach. We used this method with small modifications in approximately 120 cases between 2012 and 2015. The advantages of the modified lateral supraorbital approach are as follows: the operation duration is significantly less, the skin incision and flap are smaller, temporal muscle damage is minor. There is a single burr hole and a small craniotomy. Risks such as post-operative CSF fistula, epidural hematoma, and infection are decreased with the small craniotomy.

Keywords: Modified lateral supraorbital approach, Pterional approach, Sphenofrontal craniotomy

EP-0623 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Endoscopic Transsphenoidal Surgery in Management of Pituitary Adenomas with Extra Sellar Extension**

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Transsphenoidal approaches usually are the preferred method for treatment of pituitary tumors because of a lower risk of complications. In our institute, the microscope has been used alone in treatment of such tumor for long time. Recently, this study enable us for establishing minimal invasive surgery, so endoscope has been introduced as an alternative and effective tool in transsphenoidal surgery. The aim of the present study was to present a review of literature dealing with pituitary tumors and to evaluate the role of endoscope in dealing with pituitary tumors with suprasellar and parasellar extensions. In the present study, the endoscopic endonasal procedure resulted in improved rates of complete tumor removal, improved visual outcome and a reduced incidence of complications when compared to the microscopic transsphenoidal technique. Endoscopic transsphenoidal surgery is the preferred method for removal of the recurrent pituitary tumors because it provides better visualization and makes the orientation in the operative field of the secondary surgery easier and safer than the microscopic transsphenoidal approach. A significant advantage of this procedure is the shortened post operative stay in hospital and medication consumption which has an obvious economic issue. In

this way, it should be possible, by educative measures, to stimulate young neurosurgeons to learn this endoscopic technique, providing them with all the opportunities and encouragements in acquiring competence in this field.

Keywords: Pituitary, Endoscope, Endonasal

EP-0624 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Endoscopic Approach of Intracranial Arachnoid Cysts**

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Background: The arachnoid cyst is an entity whose pathophysiology is not yet elucidated. The choice of indications remain a matter of controversy. Nowadays, endoscopy seems to be the most favored in the literature. The aim of this study is to analyze the effectiveness of endoscopic versus non-endoscopic procedures in the treatment of cerebral arachnoid cysts.

Method: A retrospective study performed in the Department of Neurosurgery of University Hospital of Blida, from January 1990 to December 2016. A total of 152 patients with intracranial arachnoid cysts are reported.

Results: There was a slight male predominance in our study. The mean age at the time of diagnosis was 35 years (7 months to 68 years). Headache and epilepsy were the most constant symptoms. 53% of arachnoid cysts were located in the temporo-sylvian area, 26.5% in the supra-sellar region and 12.9% in the posterior fossa. 87% of these arachnoid cysts were treated with endoscopic fenestration. There was no mortality in all cases, with no morbidity for endoscopic procedures and 38% for non-endoscopic procedures. The minimally invasive endoscopic approach for treatment of cerebral arachnoid cysts is recommended as the first therapy of choice. It allows the derivation of intra-cystic fluid in the subarachnoid or ventricular spaces and avoids all the risks related to the microsurgical approach and those generated by the cyst-peritoneal shunt which exposes the patient to both infectious and mechanical complications.

Conclusion: Endoscopic procedures may be an excellent alternative to microsurgery or shunting for the treatment of arachnoid cysts.

Keywords: Arachnoid cyst, Neuroendoscopy, Minimally invasive neurosurgery

EP-0625 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]**Keyhole Approaches to Brain Tumors**

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Surgery of brain tumors via the standard craniotomy has been the mainstay in treatment of extrinsic brain tumors. However, the standard craniotomies may significantly increase the operative time, blood loss, postoperative pain, hospital stay of patients. Minimally invasive brain tumor surgery with the use of keyhole principle may be an approach that does not vary significantly

from the standard craniotomies employed. The main advantages using the keyhole principle include shorter operative time, less blood loss, postoperative pain and hospital stay of patients. Our patient population undergoing this alternative approach to surgical treatment of brain tumors has shown comparable success in tumor excision, shorter operative time, less blood loss and postoperative pain.

Keywords: Keyhole approach to brain tumors, Minimally invasive brain tumor surgery, Minimal access brain surgery

EP-0626 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Utilization of Bone Wax as a Marker for Spatial Orientation in Intra-Operative Magnetic Resonance Imaging

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The main goal of the glioma surgery is to achieve maximal extent of resection (EOR) while preserving surrounding healthy brain tissue. Determining tumor boundaries under the illumination of surgical microscope might be challenging especially when operating low-grade gliomas (LGG), due to their diffuse and infiltrative behavior. Introduction of intraoperative magnetic resonance imaging (IO-MRI) improved EOR, however even when combined with neuronavigation, precise 3-dimensional orientation under microscopic illumination might be an issue. Here, we present an alternative use of bone wax, as a marker for guidance in IO-MRI navigation. Two pediatric cases with normal neurological examinations were admitted following seizures. MRI demonstrated frontal mass lesions in proximity to eloquent regions; caudate nucleus – anterior limb of the internal capsule and Broca's area. Imaging characteristics suggested LGGs. Both cases were operated under image-guidance and IO-MRI was utilized in order to confirm resection amount. Following the initial resection, a small piece of (approximately 1 cm in diameter) bone wax was placed in the resection cavity prior to IO-MRI. Bone wax was easily identified as a prominently hypointense round structure on T2-weighted images, provided guidance and helped spatial orientation. Precise definition of tumor boundaries during LGG surgery remains to be an arduous issue. Despite high-field IO-MRI is the current gold standard of intraoperative imaging, surgery related volumetric changes limit its accuracy. Bone wax; a cheap, MRI compatible and easily identifiable marker provides guidance and improves spatial understanding of the resection cavity by the surgeon, allowing more decisive and safe resection.

Keywords: Bone wax, Intraoperative, Low grade glioma, Magnetic resonance imaging, Neuronavigation

EP-0627 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Outcomes Following Endoscopic, Endonasal Resection of Pituitary Adenomas: A Series of 225 Cases

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Background: The use of endoscope for the management of pituitary adenoma is not new. The better magnification and illumination provided by the endoscope gives better outcome than microscopic pituitary surgery. The purpose of the study to find the outcome of endoscope pituitary surgery.

Method: We did 225 cases of pituitary adenoma surgery by endoscopic endonasal approach from July 2008 to December 2016.

Results: Among 225 cases underwent endoscopic transsphenoidal approach gross total removal was done in 186 cases, rest 39 cases subtotal removal was done. Residual tumor was seen in 32 cases (15.5%) in postoperative follow-up MRI scan. Visual improvement was satisfactory and hormonal improvement of functional adenoma was nice. Postoperative visual acuity and visual field was improved in 73.77 % cases. There were 24.89% cases of temporary D.I. and about 4% cases of permanent D.I. The average duration of follow-up was 48 months. One patient was required re-exploration to correct visual deterioration in the immediate postoperative period. Two patients were also required re-exploration for C.S.F leak. There were 12.89 % cases of C.S.F leak and 5.78 % mortality. Mortality were early or late S.A.H and from electrolyte imbalance.

Conclusion: Endoscopic endonasal pituitary surgery now become a gold standard surgery for most of the pituitary adenoma because of its better outcome in relation to microscopic surgery and less complications and less hospital stay.

Keywords: Endoscopic transsphenoidal, Endoscopic endonasal pituitary surgery, Adenoma

EP-0628 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Treatment of Intraventricular Meningiomas

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Background: Intraventricular tumoral location is rare and accounts for 0.5% to 5% of all intracranial meningiomas. As compared to other intraventricular tumors.

Method: 11 patients underwent craniotomy for intraventricular meningioma resection in high technology medical center University clinic in the period from 2009 till 2016. The mean age was 51 years. Among which women rate was 8(79%) patients, men 3(21%). Headaches and seizures were most frequent initial presentations. In all cases tumors were located in the ventricular trigone. Right sided tumor location was in 8 patients, left sided –3. Pre-operative embolization we used in one case. There were posterior parieto – occipital transcortical.

Results: In all cases we used parieto – occipital transcortical craniotomies. Resection grade was Simpson I in 10 patients. Simpson II in one. Surgical mortality was zero.

Conclusion: Correct understanding of microsurgical anatomy cooperates for further success in operation in Intraventricular meningiomas. operation of Pre-operative embolization is helpful reduce bleeding.

Keywords: Meningiomas, Intraventricular, Intraventricular tumors

EP-0629 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Infratentorial Supracerebellar Approach for Removal of Pineal Region Tumor

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A pineal region tumor is an uncommon deep-seated, heterogeneous group of mass lesions of the brain, and the surgical management strategy of these tumors remains controversial. It is the purpose of this communication to present results of our experience in treating one patient with this neoplasm. A 14 year-old child consults with a progressive intracranial hypertension syndrome. Neurological examination was unremarkable. Brain MRI showed a pineal tumor with an obstructive tri-ventricular hydrocephalus. A ventriculo-peritoneal shunt was performed rapidly. Alpha fetoprotein and beta-HCG blood rates were normal. Surgical removal of the tumor was decided in order to plan adjuvant therapy. the patient was operated in sitting position, using supra-cerebellar infra-tentorial approach. The surgical removal of tumor was performed almost completely, excluding millimetric remnants on the right basilar vein. The postoperative course was uneventful. The histopathologic examination confirmed dysgerminoma. In the absence of elevated tumor markers, the surgery allows a more or less complete excision and a histologic diagnosis. The supra-cerebellar infra-tentorial approach is most used for the pineal region. This surgery is not without risk and all precautions must be taken into consideration including patient positioning, anesthesia, surgical techniques and anatomy. The tumors of the pineal region are rare and most commonly affecting children. Their surgical excision could be necessary in some cases. A good knowledge of the surgical technique should provide good results.

Keywords: Pineal tumor, Surgical technique, Infratentorial approach

EP-0630 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

The Role of Neuronavigation in Endoscopic Transnasal Procedures to Microadenomas: What are the Limits and Is It Really Necessary?

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Aim: To discuss about the necessity and reliability of neuronavigation during endoscopic transnasal procedures for hypophyseal small-size tumors, as microadenomas.

Method: Fifty patients with microadenoma operated via neuronavigation assisted endoscopic endonasal approach between the years 2014-2017 were included in our study. Intraoperative nuances and postoperative clinical and surgical results were reported in terms of removal of tumor percentage, laboratory results. The accuracy of neuronavigation was tested by touching the probe to the intranasal landmarks such as optic strut, lateral recesses, carotid bulb bilaterally and dorsum and tuberculum sella anteriorly and posteriorly in the midline and compared with the intraoperative observations. Before and after opening the dura, calculated tumor locations by navigation was compared.

Results: In all of our patients, total tumor removal was observed intraoperatively. In all patients, postoperative MRIs confirmed these observations. According to intraoperative results, the showing of navigation that the approximate location of tumor prior to and after dural opening were deduced as almost identical.

Conclusion: In almost every cases, neuronavigation systems are thought as indispensable for neurosurgeons, knowledge of brain anatomy still keeps its priority. Although CSF leakage following dural opening changes the previous locations of intracranial compartments and structures that causes inaccurate navigation results, due to the low probability of CSF leakage in microadenomas, neuronavigation can be used safely as an effective and feasible guide.

Keywords: Microadenomas, Neuronavigation, Endoscope, Transnasal

EP-0631 [Neuro-oncology » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Endonasal Resection of Craniopharyngiomas: A Case Series and Review of the Literature

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Background: Transcranial approaches were historically the first established routes for craniopharyngiomas resection. There is a limited body of literature on the outcome of endoscopic endonasal approach in resection of craniopharyngiomas. Therefore, the present study aims to assess the outcome of endoscopic endonasal approach in resection of craniopharyngiomas. Study Design: We retrospectively analyze and report our case series result and surgical outcomes and complications.

Method: Total 15 patients underwent surgery at Loghman-Hakim and Day General Hospitals (Tehran, Iran). One patient had recurrent lesion. The gross-total resection (GTR) was attempted in 12 surgeries.

Results: GTR in nine cases and near-total resection in three cases were achieved. The average follow-up period was 30 months during which one recurrence in near resection cases was observed. Vision was improved by 80%. 10 cases developed diabetes insipidus that three was permanent and three cases developed panhypopituitarism postoperatively. Furthermore, postoperative cerebrospinal fluid (CSF) leaks occurred in two patients, one of them needed reoperation for CSF leak management. In addition, postoperative bacterial meningitis occurred in two cases. Postoperative mortality was one due to bacterial meningitis and hyponatremia.

Conclusion: Endoscopic, endonasal surgery for craniopharyngioma

can be accompanied by high rates of GTR in selected case with acceptable results.

Keywords: Craniopharyngioma, Neuroendoscopy, Skull base

EP-0632 [Neuro-oncology » Intrinsic Tumors]

Cavernous Haemangioma of the Skull About 2 Cases

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Cavernous haemangioma are benign vascular tumors that may involve any part of the body. They occur less commonly in skull and represent 0.2% of all benign tumor of the skull. Its diagnosis is made with a head CT scan. We report two cases revealed by a slowly growing tumefaction of hard consistency fixed on both planes, one on the right frontal bone and the second on the parietal bone plus intracranial hypertension syndrome made of chronic headaches without any others neurologic signs. A head CT scan showed osteolytic lesion with erosion of the tabula externa. We performed a surgical excision in block completed by reconstruction of the bone defect with methylmethacrylat. The evolution was favorable in all cases marked by a total recovery.

Keywords: Cavernous haemangioma of the skull, Frontal bone, Parietal bone, Intracranial hypertension syndrome, Osteolytic lesion, Bone's reconstruction

EP-0633 [Neuro-oncology » Intrinsic Tumors]

Epidemiological Characterization of Primary Tumors of the Central Nervous System in Adult Population

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Background: Primary tumors of the central nervous system (CNS) encompass a diverse group of neoplasms originating from glial cells. Depending on the histological type, the survival of patients has a wide range of variation, making it necessary to know which histological types are most found in the primary tumor. Our aim is to determine the incidence of primary CNS tumors in adulthood according to gender and etiological classification.

Method: This is a retrospective, descriptive study with a quantitative approach of data from 69 medical records of patients hospitalized for primary CNS tumors between the ages of 18 and 60 from January 2011 to March 2016. Data were collected from a standard form and organized into a Microsoft Excel 2010 spreadsheet.

Results: The male gender was more prevalent with 53.62% (n=37), women represented 46.37% (n=32). Glioblastoma Multiforme was the most prevalent with 24.63% (n=17), followed by low grade Astrocytomas 17,39% (n=12), Meningioma 13,04% (n=9), Oligodendrogliomas, Micro/macroadenomas and Schwannomas

with 5.79% (n=4) each, followed by Craniopharyngeomas with 4.34% (n=3), and Choroid plexus Papillomas, Hemangioblastomas, Dermoid / epidermoid cyst, Pineal tumors representing 2.89% (n=2), respectively, and central Neurinoma and olfactory Neurinoma with 1.44% each (n=1).

Conclusion: It was observed that men present a higher prevalence of primary tumors in the CNS, where the main histological type was GBM. Results are in agreement with data of the current literature. In addition, they contribute as an associative measure for the diagnosis, correlating age group with primary CNS tumor most prevalent for the group in question.

Keywords: Primary tumors, Epidemiology, Central nervous system

EP-0634 [Neuro-oncology » Intrinsic Tumors]

Case Report: Parietal Osteoblastoma Manifesting as Osteoid Osteoma and Literature Review

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Benign osteoblastoma is an uncommon primary bone tumor, extremely rare in calvarium. We present a case of a 46-year-old female with an osteoblastoma that was first treated as osteoid osteoma (partial resection) then totally resected. We discussed the clinical presentation radiographic findings, differential diagnosis and management of benign skull osteoblastoma with a review of the literature.

Keywords: Osteoblastoma, Osteoid osteoma, Parietal bone

EP-0635 [Neuro-oncology » Intrinsic Tumors]

Cerebellar Peduncle Localized Oligodendroglioma: A Case Report and Review of the Literature

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Oligodendrogliomas constitute 5% of all primary brain tumors and 3rd most common cancer among intracranial tumors. More than 90% of oligodendrogliomas have supratentorial localization. Oligodendrogliomas arising in cerebellar peduncle are substantially rare even less than 1%. Up to now, six oligodendroglioma cases that are placed in cerebellar peduncle have been presented. Among those cases, only one of them originated cerebellar peduncle, while others, instead of being cerebellar peduncle originated, invade cerebellar peduncle. If we exclude the cases that invade cerebellar peduncle, instead of arising from there, our case will be in second place in literature. Moreover, will be the first pure cerebellar peduncle-originated case. We aimed to discuss our WHO grade II oligodendroglioma case which is originated from cerebellar peduncle on the light of literature.

Keywords: Oligodendroglioma, Cerebellar peduncle, Posterior fossa

EP-0636 [Neuro-oncology » Intrinsic Tumors] A Rare Cause of Vomiting- 4th Ventricular Melanoma

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Primary Malignant melanoma in brain is rare, secondary melanoma in brain is furthermore rarer, we are reporting a rare presentation of secondary melanoma deposits at the level of fourth ventricle. A 55 years old male presented with complaints of continuous vomiting for 2 months with a history of foot surgery done before for a melanoma 5 years back. After ruling out all gastrointestinal causes, Neuro imaging showed contrast enhancing lesion in 4th ventricle. Sub occipital craniotomy and excision of lesion was done, HPE confirmed as malignant melanoma. Malignant Melanoma is tumor of skin, dermoepidermal junction but it can occur in various sites like iris, mucosal membranes and meninges, secondary deposits to brain can occur but are rarely seen. Hoon joy et al. in 2002 reported a case of primary melanoma in 4th ventricle which had a good prognosis in terms of recurrence. The incidence of metastatic melanoma as 2-13%, reported by Courville and Schillinger. The prognosis of patient with metastatic melanoma considered to be extremely serious as in the series of wortis and wortis, the time between occurrence of symptoms and death was 7 days to four months. Arnvig and Christensen cited a case of circumscribed melanoma of fourth ventricle and had a good prognosis after surgery. The involvement of brain without evidence of occurrence in lungs was due to presence of vertebral venous plexus as suggested by batson. so in any case of intractable vomiting, secondary melanoma deposits has to be considered and early diagnosis and treatment would be the beneficial to the patient.

Keywords: Melanoma, Fourth ventricular mass, Posterior fossa tumours

EP-0637 [Neuro-oncology » Intrinsic Tumors]

WHO Grade III Supratentorial Extraventricular Ependymomas in Adults: Treatment Modalities and Review of the Literature

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Supratentorial ependymomas and their anaplastic variants are relatively uncommon central nervous system neoplasms that afflict both adults and children. Whereas the treatment algorithm in the pediatric population is well established, however, treatment in the adult population is less defined. In our case series of two adult patients with supratentorial ependymomas WHO Grade III (anaplastic variant), patients presented in both cases in the emergency room after having a generalized tonic clonic seizure at home the first case (cortical-intraaxial localization), and mild hemiparesis the second case (fronto-insular intraaxial extraventricular localization). Patients underwent surgical treatment and a gross total resection was achieved in both cases. The histopathological examination revealed a diagnosis of anaplastic ependymoma (WHO Grade III). Both patients had additional radiotherapy and in the first case adjuvant platinum-based chemotherapy was somministrated due to

leptomeningeal gliomatosis. In our experience, gross total resection was achieved in all patients with supratentorial extraventricular ependymomas WHO Grade III with additional radiotherapy and platinum based chemotherapy. Patients require initial close serial imaging follow-up. The role of chemotherapy is still uncertain but may be necessary in younger patients and in tumors that behave more like the pediatric ependymomas.

Keywords: Anaplastic ependymoma, Extraventricular, Supratentorial, Surgery, Treatment

EP-0638 [Neuro-oncology » Intrinsic Tumors] Brain Metastasis of Ewing Sarcoma

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Ewing sarcomas is usually derived from mesenchymal bone tissue. Mostly seen at young adults. Metastasis to brain tissue is rarely occur. We review our institution's experience of brain metastases of ewing sarcoma. 21 years old patient. 9 months ago he awared a mass in his right shoulder and got diagnosis ewing sarcoma after biopsy, Chemotherapy and radyotherapy has been performed. He come to our clinic with weakness of in right part of his body. MRI showed an hemorrhagic lesion in size of 32x39 mm at left postcentral gyrus and an another one in size of 10x13mm at precentral gyrus. Patient has been observed and serial CT scan was performed. But the hematoma did not regress. Patient is operated for diagnostical purpose. Histopathological examination pointed out brain metastasis of ewing sarcoma. His hemiparesis has been regressed explicitly after surgery. Patient's treatment went on with radyotherapy. Patients who has intracerebral metastasis of ewing sarcomas with neurological deficits, should be operated firstly. Medical treatment for edema is suggested preoperatively before surgery. Chemotherapy and radyotherapy can be executed after surgery.

Keywords: Ewing, Sarcoma, Brain metastasis

EP-0639 [Neuro-oncology » Intrinsic Tumors] Solitary Fibrous Tumor of the Meninges: A Case Report

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Solitary fibrous tumor (SFT) are mesenchymal tumors originally described in the pleura. The meningeal localization is rare and accounts for 15% of all localizations. At present, some sixty cases of meningeal TFS have been described in the literature. The WHO classification of central nervous system tumors distinguishes SFT of the meninges from hemangiopericytomas, whereas soft tissue tumors classification, have combined them since the discovery in 2013 of a common oncogenesis. A new histopronostic grading known as "de Marseille" has recently been proposed and used until the revision of the WHO classification of brain tumors. We report a case of a 36-year-old woman with no pathological history, who described headache and visual blurring evolving for two months.

The clinical examination was normal. Cerebral MRI showed a temporal extra-axial expansive process of 6 cm of axis, implanted on the tentorium without meningeal thickening. Complete surgical excision was performed. The tumor was very hemorrhagic, which required perioperative transfusion. The pathological and immunohistochemical study led to the diagnosis of a solitary fibrous tumor. There were no post-operative complications, and no recurrence at 2 year of follow up. SFT of the meninges is a rare entity, often misinterpreted as a meningioma before its excision. Its histological characteristics are evocative and the use of immunohistochemical markers, including CD34, CD99 and recently STAT6, is important for diagnosis. The quality of the excision usually determines the prognosis, and one must not ignore a recurrence or metastatic potential in rare cases.

Keywords: Solitary fibrous tumor, Meninges, WHO classification, Hemangiopericytoma

EP-0640 [Neuro-oncology » Intrinsic Tumors] Bilateral Temporal Arachnoid Cyst: A Case Report

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Arachnoid cysts are benign persistent cysts composed of arachnoidmaterie between the piamater and the duramater and frequently seen in the middle cranial fossa. Its size is quite variable. While those with small size were asymptomatic, As the size increases that it may be seen headache, dizziness, nausea, vomiting and epileptic attacks. Intracranial arachnoid cysts constitute 1-2% of all brain masses. Bilateral arachnoid cysts are rare, and eight or nine cases have been reported in the literature until now. Its can often be seen with diseases such as glutaric aciduria, bilateral temporal lobe agenesis. Bilateral arachnoid cysts are often symptomatic and are usually diagnosed in the pediatric population. Asymptomatic cases are very rare in advanced age. We published a case of bilateral temporal arachnoid cyst that was detected incidentally. A 26-year-old male patient applied to our emergency room for head trauma and bilateral arachnoid cyst was detected in computed tomography. His neurological examination was normal and good result at the mental test. Electroencephalography was reported normal. The patient was discharged to be called for control after six months. Bilateral arachnoid cysts are rare and those often with additional neurological and mental problems in literature. We present our case because its asymptomatic and incidental detection.

Keywords: Arachnoid cyst, Bilateral, Rare

EP-0641 [Neuro-oncology » Intrinsic Tumors] Lipoma in the Corpus Callosum Presenting with Epileptic Seizures: A Case Report and Literature Review

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Intracranial lipomas are rare, accounting for 0.1–0.5% of all primary brain tumors. There are attributed to abnormal differentiation of persistent primitive meninx (mesenchymal origin), followed by

transformation into mature adipose cells. We report the case of a 37-year-old woman who present epileptic seizures. Neurological examination revealed no abnormality. CT scan showed hypodensity involving the corpus callosum from the genu through the body into the splenium. MRI showed short T1 and T2 with high intensity region s in T1-weighted and a decrease in T2-weighted. MR signals were specific of lipomas. The seizures were controlled with medication and no operation was contemplated.

Keywords: Intracranial lipomas, Corpus callosum, Epileptic seizures

EP-0642 [Neuro-oncology » Intrinsic Tumors] Conus Medullaris Ganglioglioma: A Rare Intramedullary Spinal Cord Tumor

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Ganglioglioma is a slow-growing tumor composed of variably differentiated neuronal cells admixed with neoplastic astrocytes representing approximately 0,5 % of all primary central nervous system tumors. Gangliogliomas of the spinal cord are even rarer, and the conus medullaris is an exceptional site for their occurrence. We report an unusual case of Ganglioglioma of the thoracolumbar spinal cord, including the conus medullaris associated with an extensive hydromyelia. A 19-year-old female patient without previous history neurofibromatosis type 1 (NF1) presented to our emergencies with progressive weakness in her lower limbs for the past 3 weeks, aggravated one day prior to her admission by sphincter disturbances. Spinal MRI revealed an intramedullary lesion within the thoracolumbar spinal cord, including the conus medullaris associated to a C6-D8 hydromyelia. The tumor was completely removed by a posterior approach. Pathological investigation showed a Ganglioglioma consisting of predominantly mature ganglion cells associated with glial elements. No adjunctive treatment was administered and the patient is symptom free with no clinical evidence of recurrence at most recent follow-up examination, one year later. Although rare, Ganglioglioma should be included in the differential diagnosis of conus medullaris tumors with hydromyelia. Early recognition, diagnosis, and treatment are imperative to improve prognosis and minimize neurological sequelae.

Keywords: Spinal cord, Ganglioglioma, Surgery

EP-0643 [Neuro-oncology » Intrinsic Tumors] Posterior Fossa Pilocytic Astrocytoma: 10 Years Retrospective Study

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Background: Resection extent of posterior fossa pilocytic astrocytoma remains undefined and further treatment in residual tumours are a matter of debate, hydrocephalus problem has yet not been solved. We evaluate the impact of surgical technique, in terms of resection extent, by serial MRI examinations. In addition, the hydrocephalus problem was considered and related to the different treatment modalities.

Method: Retrospective study was made on 37 patients were admitted to MUH, Egypt between December 2006 until November 2016.30 patients were in pediatric age groups (81.1%) and 25 patients were female (67.6%). Macroscopic total resection of the tumor was performed in 27 patients (73%). Follow-up was obtained in all patients for a period ranging between 11 and 119 months (median, 41.5 months). The ages of patients ranged from one to 42 years (mean).

Results: Outcome was good in 27 patients who had no neurologic deficit and fair in seven patients who were slightly handicapped but had an independent life. There patients were died during the follow-up period. There were ten patients with an abnormally persistent enhancement on MRI. 13 of these patients were treated with permanent ventriculoperitoneal shunt with Four patients underwent perioperative shunt.

Conclusion: The extent of tumor resection of pilocytic astrocytoma can be defined by postoperative serial MRI examinations. Long-term follow-up with MRI seems mandatory in cases with abnormal enhancement. Hydrocephalus is a common finding in patients with a pilocytic astrocytoma. A permanent VP shunt is required in patients with postoperative hydrocephalus and preoperative acute hydrocephalus.

Keywords: Magnetic resonance imaging, Ventriculoperitoneal, Mansoura University hospital

EP-0644 [Neuro-oncology » Intrinsic Tumors]

Extent of Resection and Neurological Deficit in Early Postoperative Period in Patients with Insular Gliomas

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From 2014 to beginning of 2017 in the Department of Neurooncology of Novosibirsk Federal Center of Neurosurgery 25 patients with primary insular gliomas were operated on. Men were 11 (44%), women - 14 (56%). The average age of patients was 43 years (22 - 68 years). According to Berger - Sanai classification (2010) in 15(60%) cases the tumor were giant, in 5(20%) - involved two zones, and in 5(20%) - located in one zone. In 14 (56%) patients the tumor was located in the right hemisphere, in 11 (44%) in the left. Seizures were presented in 19 (76%) patients. All patients were operated on with the use of microsurgical techniques and neurophysiological monitoring. The extent of resection was measured by MRI with contrast made in the first 24 hours after surgery. Total removal was achieved in 9 (36%) cases, subtotal - in 10 (40%) and partial - in 6 (24%) cases. Histologically the tumors were as follows: 8 (32%) cases - diffuse astrocytoma Grade 2; 13 (52%) cases - astrocytoma Grade 3; 3 (12%) patients - glioblastoma, and 1 (4 %) case - oligodendroglioma Grade 2. The average operative time was 3 hours 35 minutes (min 1h 30 min, max - 5 hours 55 minutes). The average blood loss was 300 ml (50 - 550 ml). The new neurological deficit was noted in 6 (24%) patients: 3 patients were with elements of sensorimotor aphasia and 3 - with contralateral hemiparesis. There were no deaths related to surgery in our series.

Keywords: Insular glioma, Extent of resection, Neurological deficit

EP-0645 [Neuro-oncology » Intrinsic Tumors]

Intracranial Dural Based Chondroma; Case Report

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Intracranial chondromas are rare, benign, slow-growing tumors of mature hyaline cartilage origin, which comprise only about 0.2% of all intracranial tumors. They are most common in the 2nd and 6th decades and in women. Most of the chondromas originate from the cartilaginous synchondrosis in the cranium base. More rarely they originate from dura, leptomeninges, choroid plexus and brain parenchyma. In this case, a large intracranial chondroma originating from dura was presented. A 25-year-old female patient had a traffic accident 1 month ago. She applied to our polyclinic because of her headache. A mass located in the left frontal lobe was seen in the brain ct. Neurological examination had no pathological findings. Brain MRI showed a mass with focal hyperosteois in the adjacent bone with extraaxial located in the left frontal region. The mass which was 5x3.5 cm in size and compressing the brain parenchyma was T2 heterogeneous hyper and T1A hypointense was observed. Left frontal craniotomy was performed on the patient. When the bone was removed, it was seen that the dura was firmly adhered to the bone and the bone was destructed. When the dura was opened, a solid mass with a white colored surface with extracerebral localization was seen. The mass was totally removed. Pathological evaluation was reported as chondroma. More rarely the chondromas may originate from the dura mater or parenchyma. The effective treatment of chondroma is surgical total removal. If the tumor is totally removed, the recurrence is not seen and there is no need for radiotherapy.

Keywords: Chondroma, Benign, Dura mater

EP-0646 [Neuro-oncology » Intrinsic Tumors]

A Case of Epithelioid Hemangioendothelioma in the Primary Motor Area

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Epithelioid hemangioendotheliomas are low proliferating rare vascular tumors with distinct biological and clinical features. A rare case of an intraparenchymal subtype of this tumor located in the primary motor area is presented. According to a recent literature search, this was the first reported case on this location. We present a case of a 41-year-old man who presented to us with complaints of right upper limb weakness and focal seizures for twenty-one months prior to admission, and diagnosed with an intraparenchymal epithelioid hemangioendothelioma located in the primary motor area. A brief review of literature from PubMed Central using the term "intracranial epithelioid hemangioendothelioma" revealed 38 reported cases. The patient's postoperative recovery was unremarkable, however, the right upper limb motor power grade remained unchanged. Six months after complete tumor resection, there has been no recurrence of the tumor. Neither preoperative embolization nor postoperative adjuvant chemoradiotherapy was given. This case report is instructive because it highlights the

importance of histopathological and immunohistochemical studies in confirming the diagnosis of epithelioid hemangioendotheliomas, since a number of intracranial neoplastic lesions may simulate these tumors on radiological and clinical bases. Early detection of these tumors may help into correct diagnosis and appropriate treatment to the patients, and result into a favorable outcome.

Keywords: Epithelioid, Hemangioendothelioma, Intraparenchymal, Immunohistochemistry, Navigation, Primary motor area

EP-0647 [Neuro-oncology » Intrinsic Tumors]

Use of 18F-FDG-PET-CT in Glioma Surveillance: A Single Centre Experience

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Background: Radiological surveillance in glioma surgery is primarily with MRI. Differentiating between disease progression and radionecrosis can be challenging.

Method: In our unit, in selected cases, we have augmented our surveillance with 18F-FDG-PET-CT which can highlight areas of metabolic activity which correlate with increased tumour activity.

Results: We identified 19 cases of PET imaging for glioma surveillance of whom we could assess 17 notes and images. Mean age was 45.06 (30-67) with male: female ratio 9:8. 15 /17(88.2%) patients had surgery and 2 declined surgery(7 biopsy only, 8 debulk and 2 declined surgery). Initial histology was pilocytic astrocytoma (1), grade II (4, 26.7%), grade III (6, 40%), GBM (3) and non-specific tissue (1). Five patients had evidence of increased uptake on PET and all showed clinical progression, with only 3 clinically fit for surgery (histology showed 2 recurrence, 1 transformation). 10 patients had no increased uptake on FDG with 4 on on-going surveillance for an average of 8.5 years (7-12), 2 clinically progressed at 2 and 8 years after initial presentation at the point of PET imaging and received palliative chemotherapy, 1 had concurrent inoperable lung cancer and was palliated, 1 patient had transformation from glioma grade II - III, 1 had grade 2 histology, and 1 had only gliotic tissue on re-operation.

Conclusion: A positive FDG PET has a positive correlation with disease progression and may be considered as an adjunct test in glioma surveillance.

Keywords: Glioma, 18 FDG PET CT, Radionecrosis

EP-0648 [Neuro-oncology » Intrinsic Tumors]

Multifocal Glioblastoma Multiforme: A Case Report with Pathological Study and Review of Literature

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Multiple gliomas represent 2-5% of all high grade gliomas which are categorized as multifocal or multicentric depending on the timing, location and pattern of spread. Glioblastoma multiforme is a highly infiltrating tumor and most of the time cannot be resected completely. The feasibility and extent of surgical resection depends

on tumor size and location of brain. This is a case report of a 70-year-old gentleman with multifocal GBM affecting his right temporal, frontal and occipital lobe. He was presented with left hemiparesis and dysarthria, Karnofsky performance score was >70 at initial presentation. He undergone two surgeries followed by radiotherapy. Histopathology diagnosis was GBM, WHO grade IV. His neurology improved for one and half month before deteriorating to left hemiplegia. MRI showed progression of disease from two lesions to multiple brain lesions at right hemisphere after 3 months onset of disease. The patient and his family decided to forego treatment and pursue palliative care. He expired 5 months after the initial diagnosis. Patients diagnosed with multifocal GBM on presentation have significantly worse survival than those with solitary tumors. Long term survivals are rare.

Keywords: Glioblastoma multiforme, GBM, Multifocal glioblastoma

EP-0649 [Neuro-oncology » Intrinsic Tumors]

The Oxford Experience of Surgical Approaches and Outcome of Pineal Region Tumors: A 12 Year Series

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Aim: To determine the outcomes of surgical resection of the pineal region tumors and the surgical approaches.

Method: We retrospectively analyzed the surgical results of open resection of pineal region tumors over a 12 year period with emphasis on the anatomical approach. The relevant anatomy of the approaches was reviewed and the correlation with pre-operative imaging studied. Analysis of the complications associated with each approach was investigated along with completeness of resection.

Results: A total of 36 pineal region tumours have been treated of which 17 underwent surgical resection. Histopathological diagnoses included: Gliomas, Pineoblastomas, Pineocytomas, Germinomas, PNET, Teratoma, and Epidermoid. Complete microsurgical resection was performed in 8 out of 17 cases: 4-inter hemispheric transtentorial, 3 – infratentorial supracerebellar, 1 – inter hemispheric transcallosal. Sub-total resection achieved in 9 cases: 5 – interhemispheric transtentorial, 4 – infratentorial supracerebellar.

Conclusion: Surgeon preference and neurovascular structures determine the surgical approach of these tumors. Microsurgical respectability is dependent on anatomical familiarity and pre-operative radiological imaging to plan the approach. The surgeon should be with both approaches.

Keywords: Pineal region tumors, Suprasellar infratentorial

EP-0650 [Neuro-oncology » Intrinsic Tumors]

Practical Application of Intraoperative Tractography on Awake Brain Surgery

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Background: Tractography is a technique which allows a non-invasive understanding of subcortical tracts. However, there is an open debate on inter-observer variability, ultimate precision. In our study we analyze the practical benefit of intraoperative tractography in awake brain surgery.

Method: Prospective study using intraoperative tractography on awake surgery patients at Sant Pau Hospital. Follow up started in 2014 until present day. We compare variables in awake patient surgeries with and without the use of intraoperative tractography.

Results: N=36 patients. 25(69,4%) male and 11(30,6%) female. Mean age: 53,8(33-75) years. Awake surgery with intraoperative tractography was performed on 19 patients [52,8% CI95% 36,5-69,1%]. On 17 patients, this technique was no available [47,2% CI95% 30,9-63,5%]. Mean surgical time on the tractography group was of 93,6 minutes, versus 119,8 minutes without this tool. Mean surgical time reduction was of 26,1 minutes [CI95% 9,3-43 minutes](p=0.004). The mean degree of patient collaboration scored 7,4 when using intraoperative tractography, versus 6,8 when not, mean pain scores were of 2,6 versus 3 and mean anxiety score of 3,3 versus 3,2 (p=0.403,p=0.394 and p=0.889 respectively). 73,7% of the patients operated with intraoperative tractography had total resections, against 52,9% for those without this tool (p=0.299).

Conclusion: Intraoperative tractography aids the surgeon reducing the duration of awake patient surgeries, although there is no statistically significant repercussion on intraoperative anxiety or pain scores, nor on the degree of collaboration during the procedure. It seems that a higher rate of full resections is obtained when using intraoperative tractography, despite no statistical significance.

Keywords: Awake surgery, Brain tumors, Intraoperative tractography, Duration of surgery

EP-0651 [Neuro-oncology » Intrinsic Tumors]

Glioblastoma Multiform in 7 Year Old Female Patient. Case Review

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GBM in pediatrics forms 8–12% of brain tumors in this age group, Mean age of GBM is 15.2 years. The aggressiveness of this tumor in pediatrics is equal to that of adult group. This is a report of a 7-year-old female patient with GBM diagnosed after 2 sessions of surgical resection and oncotherapy. This 7-year female patient presented 1.5 years ago with left side weakness and signs of increased ICP “Vomiting and fits”, Diagnosed with Rt. Parietal SOL had first session in January 2016 biopsy was GBM grade 4. Sent to oncology department for her oncotherapy then re-represented 6 months later in July 2016 with persistent vomiting and imaging showed mass effect at same site. Resurvey was done and it was GBM 4 resent to oncotherapy for therapy. Then patient was presented to us 3 weeks ago with signs of increased ICP and ADLOC GCS 9/15 imaging showed intraventricular lesion and hydrocephalus. V-P shunt was placed but conscious level didn't improve and patient had status epilepticus post op. kept in triple antiepileptic's and sedation. Now patient is on adrenaline support and intubation with GCS 2/10 intubated and signs of brain stem death. GBM may rise at younger age of that published in literature with more aggressive behavior and recurrence.

Keywords: GBM, Pediatrics, Recurrence

EP-0652 [Neuro-oncology » Intrinsic Tumors]

Primary Intracranial Malignant Ectomesenchymoma in Pineal Region: A Rare Case and Literature Review

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Primary intracranial malignant ectomesenchymoma (MEM) is a rare proliferative disorder that only occasionally involves the central nervous system. We presented a 16-year-old case of primary MEM located in pineal region. The patient was treated by total surgical resection followed by radiation and experienced no recurrence during the 6-month follow-up. The clinicopathological features of this case raised two two points for the first record, as the first regarded the special age and pineal location as well as the second regarded the specific pathological components with malignant large round cells. The diagnosis for MEM is still challenging. The histological displays, immunophenotypical characteristics and cytogenesis arrays are still reliable evidence for diagnosis. Surgical resection has been demonstrated an effective treatment, but radiotherapy and chemotherapy have not been confirmed reliable therapeutic efficiency.

Keywords: Ectomesenchymoma, Neuroectodermal, Rhabdomyosarcoma, Pathology, Diagnosis

EP-0653 [Neuro-oncology » Intrinsic Tumors]

Iatrogenic Atypical Meningioma Seeding Outside the Cranium; A Case Report and Literature Review

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Meningiomas are common intracranial extra-axial tumours and are benign in character. It accounts for 15-20% of all intracranial tumours. In 0.1% of the cases, meningiomas may show extra-cranial metastasis, occurring mostly in the lungs, liver, and lymph nodes. We presenting a rare case of atypical meningioma seeding to a surgical scar following the previous craniotomy. 63 years old lady with history of recurrent left atypical meningioma - had underwent 2 previous surgery; first one in 1990 and the second on in 2013 with no radiotherapy given previously - presented with history of left scalp swelling inside the margin of the previous craniotomy incision wound for 1 year. The swelling is increasing in size, slightly tender on palpation, mobile, firm and well circumscribe on palpation. No obvious overlying skin changes. She underwent resection of the tumour in November 2016. Intra-operatively the tumour is whitish in colour, firm, well defined edges. Complete resection of the tumour achieved. Histopathology examination of the tumour revealed that the tumour is atypical meningioma. Surgical resection carries the risk of metastasis through the mobilisation of the meningioma or through the surgical trajectory. To date, there are only few cases reported for suspected iatrogenic implantation of the

atypical meningioma. In conclusion, atypical meningioma carry a risk of iatrogenic seeding of the tumour and strict adherence toward oncological procedures is needed to prevent it.

Keywords: Atypical meningioma, Iatrogenic, Seedling, Extra-cranium

EP-0654 [Neuro-oncology » Intrinsic Tumors]

Parasagittal Located Clear Cell Anaplastic Ependymoma

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Intracranial ependymomas are rare in adults. They are more supratentorial in the adults. Supratentorial ependymomas tend to be associated with the wall of the ventricle in the trigonal region. Pathological diagnosis of anaplastic ependymomas is difficult. In this study, we present the parasagittal located clear cell ependymoma, a rare variant of anaplastic ependymomas. A 72-year-old female patient was admitted to our clinic with complaints of headache. Patient was conscious, orythetic, co-operative and her limbs was moving admitted to initial diagnosis with intracranial mass. Brain MRI revealed a massive lesion in the right occipital lobe showing heterogeneous contrast involvement on the axial plate about 40x38 mm The lesion was observed posterior medially to the interhemispheric fissure and had a close proximity to the superior sagittal sinus. The patient right parieto-occipital craniotomy was performed, the lesion was excised totally not residually. Histopathologic diagnosis was reported as a clear cell anaplastic ependymoma. The patient was directed to radiationoncology for radiotherapy. Ependymomas accounting for 2% of brain tumors in the adult age group and mostly supratentorial. They are almost always related to the ventricular surface, and rarely can be located in the brain parenchyma. Gross total resection should be preferred for treatment. Pathological diagnosis of Grade III ependymomas is difficult. Radiotherapy is an effective treatment method using for many years. In this case to be emphasized that it should not be ignored the anaplastic ependymomas in differential diagnosis of parasagittal masses determined during adulthood, if it's quite rarely.

Keywords: Parasagittal, Clear cell anaplastic ependymoma, Adult

EP-0655 [Neuro-oncology » Intrinsic Tumors]

Primary Gliosarcoma

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Primary gliosarcoma is a kind of tumor, which is mostly seen in the 6th and 7th decades of life. Gliosarcoma is a rare central nervous system tumor with poor prognosis. Gliosarcoma a variant of glioblastoma. The treatment of gliosarcoma is not similar to glioblastoma. These tumors most commonly arise in the temporal lobes, followed by parietal and frontal lobes. It might be given a case

example in order to understand the tumor symptoms.72 year old female who was admitted to the hospital with weakness in the right half of the body and severe headache. The neurologic examination revealed right hemiparasis. Then, magnetic resonans (MRI) scans of the brain showed left parietal lobe white matter in the plant cystic-necrotic appearance that keep the heterogeneous intense contrast painted 40x41x40 mm sized audience was being watched. The patient was operated and the tumor was totally removed. Histological examination in the glial tumors areas GFAP (+), Vimentin (+), NFP (+) and in sarcomatous areas SMA (+) showed that the sarcomatous areas were dense from the reticulum staining and poor reticulin staining in glial areas. In addition, gliosarcoma is a rare primary tumor of central nervous system tumors composed of glial and mesenchymal components and it has an aggressive clinical behavior with poor prognosis. Totally surgically resection and radiotherapy and chemotherapy is the treatment modality that was accepted.

Keywords: Glioblastoma, Gliosarcoma, Poor prognosis

EP-0656 [Neuro-oncology » Intrinsic Tumors]

The Functional Preservation on Recurrent Glioma with Awake Craniotomy

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Background: Awake craniotomy (AC) was performed for glioma occurred near eloquent cortex to reduce post-operative neurological deficit. Some studies prove that re-resection for recurrent glioma benefits the survival of patient. Whether re-resection by using awake craniotomy in recurrent glioma improves patient's functional outcome is obscure. This study aims to compare the general performance and neurological outcome for glioma patients after AC in both newly onset and recurrent groups.

Method: From May 2013 to January 2016, medical records of 71 glioma patients' who received awake craniotomy were reviewed. New onset neurological deficits include motor weakness, sensory deficit, aphasia, and hemianopia were evaluated on postoperative 7 days (early) and 3 months (late). General performance was assessed by Karnofsky performance status scale (KPS) preoperatively and on postoperative 3 months.

Results: There are 45 patients in newly onset group and 26 patients in recurrent group There is no difference in characteristics of patients between two groups. The proportions of extension of resection (EOR) in two groups are similar. (p=0.56). The early neurological deficit (END) in two groups were 13.3%, 3.85%(p=0.196) and late neurological deficit(LND) were 2.2%, 3.8%(p=0.69) respectively. There were 42.2% patients in newly onset and 46.2% patient in recurrent group who observed the improvement of KPS after AC. (p=0.14).

Conclusion: Awake craniotomy in treating recurrent glioma is as effective as that in newly onset glioma. There is no difference in the EOR, neurological outcome and general performance after AC between the recurrent group and the newly onset group.

Keywords: Awake craniotomy, Glioma, Recurrent, Neurological deficit, KPS

EP-0657 [Neuro-oncology » Intrinsic Tumors]**The Potential of Latrophilin and Seven Transmembrane Domain-Containing Protein 1 (ELTD1) as a Future Target in Glioblastoma Treatment**

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Glioma, a generic term used for any tumors originating from the glial cells, accounts for more than 80% of all central nervous system neoplasms. Depending on their grade, glial tumors are divided in low and high grade glioma. The five-year survival rate for high grade gliomas is low and expected to reach about 5%. However, due to their fast-growing patterns and infiltrative dynamics, total surgical tumor resection is difficult. Recent clinical trials of targeted anti-angiogenic agents, in treating malignant brain tumors, have proven to be disappointing. Up to this moment, reports showed an association between high grade gliomas and ELTD1 expression. ELTD1 is presumed to be a new potential marker for glioblastomas, although no definitive functional data is available and further investigations are needed. For this purpose, we used glioblastoma tissue-samples and low passage glioblastoma cells, obtained after tumor resection in patients undergoing surgery at the "Bagdasar-Arseni" Hospital, Bucharest. We found that human glioblastoma tissue express ELTD1. Moreover, it appears that ELTD1siRNA induces cell death in glioblastoma cells. In conclusion, improving our understanding in how ELTD1 is regulated in brain tumors and validation of these results in vivo will allow future therapeutic strategies to be developed. Acknowledgments: PN-II-ID-PCE-2011-3-1041 UEFISCDI, Romania

Keywords: ELTD1, Glioblastoma, Potential marker

EP-0658 [Neuro-oncology » Intrinsic Tumors]**Pleomorphic Xantoastrocytoma and Ependymoma, Coexistence of Two Distinct Tumors at the Same Surgical Site: A Case Report**

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Pleomorphic Xantoastrocytoma and Ependymoma are two classes of tumors of glial origin but distinct in several epidemiological, molecular, histopathological and prognostic aspects. The objective of the present study is to describe a rare case of the coexistence of two distinct tumors in the same site in a 20 year old patient. The patient in question started with episodes of seizures. She was

referred to our service after performing two surgeries at another hospital with the diagnosis of pleomorphic Xantoastrocytoma. During follow-up, it was observed after four years, an increase in the number of seizures and a small increase in the temporal lesion at the examination of the image. Therefore, the near total resection was performed due to its extension to the brainstem with histopathological and immunohistochemical diagnosis (positivity for S-100 and GFAP protein, negativity for synaptophysin, Ki67 <1%) of pleomorphic Xantoastrocytoma. However, after four months of the last resection, the patient was hospitalized with somnolence, headache and motor dysphasia. Magnetic resonance imaging showed a significant increase in the lesion with a substantial mass effect and heterogeneous aspect, different from that observed in the previous exams. Near total surgical resection was then chosen. Nevertheless, there was another diagnosis in both the histopathological and immunohistochemical aspects (positivity for GFAP, CD56, Vimentin and EMA, negativity Cromogranine, Ki67: 80%) revealing anaplastic ependymoma. After extensive review of the literature in Pubmed, no case report was found showing the coalition of the dual different tumors in the same surgical site.

Keywords: Pleomorphic xantoastrocytoma, Ependymoma, Tumors, Seizures

EP-0659 [Neuro-oncology » Intrinsic Tumors]**Giant Intracranial Abscess in a Two Months Infant: A Case Study and A Review of Literature**

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Intracranial abscesses are uncommon but serious conditions that usually occur in patients with certain risk factors. A 2 months-old boy admitted for evaluation of congenital heart disease. He was referred for further investigation to Siyami Ersek Cardiology Education and Research Hospital. Neuroimaging showed space-occupying lesion with low attenuation, septated-cavitary mass with wall-enhancement and fluid-fluid line in the right frontal and parietal lobes, diffusion restriction in the central component, and suspected brain abscess. The patient referred to our clinic. He was operated, with right frontal mini craniectomy, yellowish green-colored purulent material was aspirated, biopsies taken from cyst wall. Frozen pathology reported as glial tumor?. Materials were sent to pathology and microbiology clinic. Pathology sample was confirmed as "abscess". Triple antibiotic therapy was given for 2 weeks. The patient followed as vital signs stable, no neurologic deficit. The patient transferred to the cardiology hospital and had a cardiac surgery and discharged. The patient showed an excellent treatment outcome with normal development. Successful treatment requires a multidisciplinary approach including as surgical drainage and antibiotic therapy. Open surgical evacuation of the abscess is preferred if possible along with concurrent prolonged parenteral antibiotic therapy is the choice of treatment.

Keywords: Intracranial abscess, Infant brain mass, Congenital heart disease

EP-0660 [Neuro-oncology » Intrinsic Tumors]**Evaluation of Serum S100B Values in High Grade Glioma Patients**

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Background: Assessment of serum S100B values' additional contributions to the current scan techniques in the diagnostic and postoperative follow-up stages of high grade glial tumors and assessment of availability of serum S100B protein values as a tumor marker or a prognostic factor for the high grade glial tumors.

Method: 14 patients who were operated with high grade glial tumor diagnosis in the neurosurgery clinic and a control group consisting of 14 healthy individuals were enrolled to the study. Serum S100B protein values were measured and tumor volumes of the patients were determined with the scan techniques. Preoperative and postoperative S100B values were compared.

Results: When serum S100B values of patient and control groups were compared, S100B values of the patient group were found significantly higher ($p < 0.05$). When the patients' tumor volumes and serum S100B values were compared, statistically significant relation between tumor values and serum S100B values wasn't determined ($p > 0.05$). But a significant reduction of S100B values was determined in the postoperative day 5 measurements of the patients in whom total resection was performed ($p < 0.05$).

Conclusion: A significant correlation wasn't determined as the assessment of tumor volumes and serum S100B values. The rise of the serum S100B values in the high grade glioma patients was defined but a definitive conclusion wasn't determined because of the false negative values and the minority of the patient group ($N=14$). We think that more significant and directive conclusions shall be defined with the more comprehensive studies in the oncoming period.

Keywords: Glioblastoma, High grade glial tumor, S100B

EP-0661 [Neuro-oncology » Intrinsic Tumors]**Brainstem Abscess. What to Do? Experience with 12 Cases**

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Background: Retrospective study of twelve cases of a rare pathology treated during twenty years period in our Service, considering the clinical presentation, etiology, co-morbidities, choices of clinical our surgical treatment (craniotomy or stereotactic aspiration) and complications in each case reported.

Method: The brainstem abscess represents 0.5 to 6% of all brain abscess. Its etiology is spreading in a Hematogenic way, being the most frequent causes the pulmonary arterial-venous fistula and heart diseases as arrhythmia. In the case of immunodeficiency, we must take into account all the particularities of these patients. In 12 cases, we have 6, where, the development of symptoms were very fast instead of medication. We present 12 cases of brainstem

abscess, most of them in the Pons, being 3 treated by open surgery 3 per stereotactic aspiration and 5 treated only with specific drugs. 1 patient with a bulbar abscess without clinical conditions of treatment have a fast bad evolution.

Results: Our outcome in those 12 cases of Brainstem abscess were: 03 Patients died in the post-operative ICU, all with pulmonary complication, secondary of the brainstem lesion and prorogated Mechanical breathing. 04 Patients have a good evolution and life-quality. 05 Patients have a high level of personal care dependency with important deficits, that were expected in these terrible topography of lesions.

Conclusion: The two surgical approaches used, did not show difference in survival or sequelae of cases. The clinical drug treatment must be discussed with the Infectologist in each singular case. Literature shows different and similar dealing with, that will be discussed

Keywords: Brainstem abscess, Literature, Cases

EP-0662 [Neuro-oncology » Intrinsic Tumors]**Surgical Site Seeding of Glioblastoma in Childhood: A Rare Case and Review of the Literature**

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Glioblastoma (GBM) is the most common, malignant, primary brain tumor. GBM comprises 7-12% of all intracranial neoplasms in children. GBM metastasis outside central nervous system (CNS) is a rare entity. Here, we present a comprehensive literature review, along with a case report of a GBM metastasis outside CNS in a child. A literature review of reports on the metastasis of GBM outside CNS in pediatric age group was performed using MEDLINE, PubMed and Google Scholar. Mean duration from diagnosis to metastasis detection, overall survival and 2-year survival rate was calculated. Our case was an 8-year-old girl with a histopathological diagnosis of GBM, presented with a subcutaneous seeding of the tumor at the surgical site, following radiotherapy and chemotherapy. Literature review revealed a total of 16 cases. The most common site of metastasis was bone. Mean duration from diagnosis to metastasis detection was 8.1 months (range 1 - 25 months). Mean overall survival was 12 months (range 1 - 35 months) and 2-year survival rate was 25%. GBM metastasis outside the CNS in pediatric population is a rare condition that might be linked to poor survival rates compared to typical GBM cases. Surgical seeding of the tumor should be considered in the management of these group of patients.

Keywords: Extracranial, Glioblastoma, Metastasis, Pediatric, Seeding

EP-0663 [Neuro-oncology » Intrinsic Tumors] Optimizing Outcomes of Surgery for High-Grade Gliomas in Eloquent Brain Areas

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Background: Surgical resection of high-grade gliomas involving eloquent brain areas carries a high risk of postoperative neurological deterioration limiting the extent of tumor resection.

Method: Total of 84 patients (51 males, 33 females, mean age 50.4 years, range 23-72 years) underwent preoperative MRI with Gd-enhancement (3D-T1W, T2W, FLAIR, DTI-FT), CT and SPECT. In all cases brain tumors involved or located directly in eloquent areas (Sawaya grade III). The surgical planning and tumor microsurgery resection were carried out using StealthStation navigation system (Medtronic Inc., USA). The surgical planning was performed with a 3D volumetric reconstruction of cerebral hemispheres' surface, tumor, corticospinal tracts, motor areas, ventricles, cerebral arteries, dural sinuses and cortical surface veins. The surgical trajectory and volume of safe tumor resection were defined and calculated preoperative.

Results: A gross total tumor resection was achieved in 40 (47.6%) patients, subtotal resection in 36 (42.9%), partial resection in 8 (9.5%). Median KPS score increased from 67.2 to 83.1 after surgery ($p < 0.05$). The compound analysis of FLAIR, DTI-FT, DWI and SPECT data was crucial for the delineation of tumor infiltration area. The surgical planning with multimodal data sets co-registration revealed the spatial relationship between tumor and surrounding eloquent brain structures. The using of 3D models helped to select of optimal approach to the tumor and feasible extent of resection.

Conclusion: The advances in neuroimaging techniques, surgical planning, and multimodal neuronavigation allow optimizing the extent of tumor resection in eloquent brain areas and help to avoid postoperative neurological disorders.

Keywords: High-grade gliomas, Eloquent brain areas, Neuronavigation

EP-0664 [Neuro-oncology » Intrinsic Tumors] Ruptured Intracranial Dermoid Cyst: Case Presentation

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Intracranial dermoid cyst is a rare congenital benign brain tumor that is a developmental malformation originating from ectodermally committed cells result of a secondary defect in neural tube formation. Their typical location close to the midline. Rupture of an intracranial dermoid cyst is a rare complication. The most common clinical presentation is that of headache and seizures whereas, many intracranial dermoid cysts are asymptomatic. Here we present a male patient who has the headache as a sole clinical manifestation of ruptured intracranial dermoid cyst. A 46-year-old man, presented to our outpatient clinic with the complaint of constant

headaches. The patient had no nausea, vomiting, altered mental status, or seizures. He had no significant past medical history. On presentation, vital signs and laboratory evaluation were normal. No focal neurologic deficits were identified. No pathological cell count was detected in his cerebrospinal fluid. A computed tomographic (CT) scan and magnetic resonance imaging (MRI) performed. 33x24 mm sized, round shaped, and very low density heterogenous mass was evident in the right frontal lobe. No surgical operation recommended. Intracranial dermoid cysts contain varying amounts of ectoderm derivatives to include apocrine, sweat glands, sebaceous cysts, hair follicles, squamous epithelium, and teeth. As a result of the mass effect compression, optic chiasm rupture and aseptic chemical meningitis, the presentation of dermoid tumors varies headache to seizures or death. Dermoid cysts mostly have a favorable outcome. In case of the dermoid cysts cause mass effect and serious neurological deficits, surgery is recommended.

Keywords: Dermoid cyst, Rupture, Spontaneous, Diagnosis

EP-0665 [Neuro-oncology » Intrinsic Tumors] A Schwannoma Case that Arising from the Optic Nerve and Invading the Cavernous Sinus

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Schwannomas that originating from the optic nerve and invade the cavernous sinus are exceedingly rare. A 55 year old female presented with progressive visual loss and periorbital pain for 1 year. She complained about total visual loss on her right eye since 1 month. On examination exophthalmos, loss of pupillary reflex with dilatation, conjunctival hyperemia and total ophthalmoplegia detected on right eye. On fundoscopy optic atrophy on right eye detected. Visual acuity was 0/10 on right. No ptosis was detected. Computed tomography and contrast enhanced magnetic resonance imagination revealed there was a destruction on lateral wall of orbita and anterior clinoid process and a heterogenous contrast enhancing, septated lesion that compromise right temporal lobe, right internal carotid artery and invasion of the lateral wall of cavernous sinus. In operation a fronto-orbito-zygomatic craniotomy was done and Dolenc's approach was performed. The tumor that arising from the optic nerve sheath was seen. Optic foramen was enlarged, optic arterial and venous structures was compressed by the tumor. The tumor excised gross totally. Pathological diagnosis was schwannoma. Postoperative visual activity was 2/10 on right eye. And movements of eyes were normal. The optic nerves are myelinated by oligodendrocytes. Theoretically schwannomas should not arise from the optic nerve. But because of innervation and vasculature of optic nerve and its sheath these rare lesions may occur. Neural structures and membranous anatomy of cavernous sinus must be preserved during the operations like these. Dolenc's surgical approach can be performed to treat lesions that invade cavernous sinus like our case. Preoperative study of radiographic findings and planning the operation for these rare lesions reduce the complications, so clinical outcomes will be better.

Keywords: Schwannoma, Optic nerve, Cavernous sinus, Ophthalmoplegia

EP-0666 [Neuro-oncology » Intrinsic Tumors]**Intraparenchymal Tumor: A Case of Malignant Tumor of Peripheral Nerve Sheaths Developed on a Schwannoma**

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Female patient, 57 years old, with no previous history, has intracranial hypertension syndrome, bilateral anosmic, language disorders and convulsive seizures, cerebral MRI objective two lesions "a median frontal basal evoked meningioma of the ethmoidal jugum and one Intraparenchymatous parieto temporal left glial". macroscopically total excision of the intraparenchymatous lesion was performed and the anatomopathological study returned in favor of a malignant tumor of peripheral nerve sheaths developed on a schwannoma, patient in good clinical evolution oriented to radiotherapy and will be Later programmed for its meningioma.

Keywords: Intraparenchymal tumor, Schwannoma, Malignant tumor of peripheral nerve sheaths, Associated tumor of the base

EP-0667 [Neuro-oncology » Intrinsic Tumors]**Meningeal Melanocytoma of the Posterior Fossa**

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Primary melanocytic neoplasms of the central nervous system can vary from well-differentiated melanocytoma to its malignant counterpart, melanoma. Primary pigmented tumors of the leptomeninges are uncommon lesions and form a varied group of entities. They include melanotic schwannoma, malignant melanoma, melanoblastosis, and meningeal melanocytoma (MM) the latter being rather rare and usually having benign behavior. A 43-year-old woman was admitted with sudden severe headache associated with nausea and vomiting. She had a history of episodes of slight headaches. No abnormalities were observed on neurological examination. magnetic resonance imaging (MRI) demonstrated an isointensity lesion surrounded by a low-intensity area at the right cerebellar hemisphere. On T2-weighted images, the lesion appeared as an isointensity. The patient was surgically treated by a posterior fossa craniotomy. Histopathologic analysis showed a highly cellular lesion, composed of cells with abundant and eosinophilic cytoplasm and small nucleoli. Mitotic figures and necrosis were not found. The histopathologic diagnosis was MM. Neoplasms derived from leptomeningeal melanocytes are uncommon lesions found either in diffuse or localized form. Localized lesions present sporadically as meningeal masses and range from well-differentiated melanocytomas to malignant, potentially disseminating melanomas. Melanocytomas may be mistaken for meningiomas because both tumors are meningeal based and feature tight cellular nests or whorls. The prognosis is quite good in cases of totally removed MM. Postoperative survival time has ranged from 1 to 28 years. In conclusion, MM is a rare clinical entity, a histologically well-differentiated lesion, and cytologically benign. Meningeal melanocytomas are usually cured by complete surgical resection alone, so this should be the goal of the treatment.

Keywords: Melanocytoma, Posterior fossa, Tumor

EP-0668 [Neuro-oncology » Intrinsic Tumors]**Intracerebral Gangliogliomas About 5 Cases**

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Ganglioglioma is a rare and slowly growing benign tumor. We performed a series of 5 cases in a retrospective study from January 2008 to 2015. All cases are confirmed histologically. The aim of this study is to analyze the epidemiological, clinical, therapeutic and evolutionary aspects of this disease. Clinical signs were dominated by intracranial hypertension followed by cerebellar syndrome and comitial seizures. CT and MRI brain have been performed in all our patients. Their appearance on imaging is very variable: from a partially cystic mass with an enhancing mural nodule (3 cases) to a solid mass expanding the overlying gyrus (1 case). one case of tumors showing mixed signal intensity. A histological diagnosis of ganglioglioma was made when a tumor had a mixture of neoplastic neuronal and glial cells irrespective of which component was predominant. Complete resection produced the best outcomes (4 cases) and incomplete resection followed by adjuvant showed favorable outcome (1 case). Good prognosis correlated with the quality of excision and histopathological grading.

Keywords: Gangliogliomas, Resection, Histopathological, Grading

EP-0669 [Neuro-oncology » Intrinsic Tumors]**Moria Syndrome: A Forgotten Terminology**

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Psychiatric disorders may have an organic origin. Frontal lobe lesions may result in psychiatric disorders and changes in personality. Symptoms such as childishness, frivolous behavior, deficient judgment, lack of seriousness occurs in the course of prefrontal lobe syndromes. This is also called Moria Syndrome. We present a case of Moria syndrome following glioma of the frontal lobe. A 40-year-old male, presented with a 5-year history of progressive disinhibited behavior, altered speech, and suspiciousness. He developed alterations and changes in his personality. He has been using risperidone (1 mg/day) and olanzapine (5 mg/day). His physical examination revealed weakness and rigidity in his legs bilaterally. His deep tendon reflexes were elicited. Babinski's sign was present on the right side. Ophthalmoscopic evaluation revealed left optic disc edema and retinal venous stasis and temporal visual field loss in the right eye. He had an altered mental status. His insight and judgment were poor. Magnetic resonance imaging showed a left prefrontal tumoral lesion with the contrast enhancement and bilateral frontal edema, considered to be a glial tumor. His family refused the surgical approach. He developed frontal akinetic mutism and seizures. He was started oral phenytoin (300 mg/day). Based on the site of the lesion, prefrontal lobe dysfunction is divided into a disorganized, disinhibited, and apathetic type. Neurosurgical operations are recommended in selected cases. This patient suggests that damage to this area of the brain can result in

psychotic clinical syndromes such as Moria and need to be managed by the multidisciplinary approach.

Keywords: Moria syndrome, Glial tumor, Brain, Seizures

EP-0670 [Neuro-oncology » Intrinsic Tumors]

Primary Central Nervous System Lymphomas: Retrospective Analysis of 10 Cases

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Background: Primary central nervous system (CNS) lymphoma, a rare form of non-Hodgkin's lymphoma (NHL), is defined as an aggressive extranodal, high-grade B-cell neoplasm of the CNS. The incidence of CNS lymphoma has been increasing over the past three decades. It has an overall poor prognosis. This study attempts to further delineate the clinico-pathological, immunohistochemical and radiological profile of primary CNS lymphoma.

Method: 10 patients with pathologically confirmed primary CNS lymphoma were analyzed retrospectively between May 2011 and January 2017.

Results: Of the 10 primary CNS lymphoma patients, 7 (70%) were females and 3 (30%) were males. Mean age at diagnosis for all patients was 59.1±13.98 years. The most common location in the brain was the region of basal ganglia in 8 patients (80%), 3 (30%) had multiple intracranial masses. Stereotactic brain biopsy was performed for 8 patients (80%) while 2 patients (20%) had tumor resection with craniotomy. All were Non Hodgkin B-cell lymphomas, among which 9 (90%) were diffuse large B-cell lymphomas. All cases showed diffuse and strong positivity for CD 20. No patients were immunocompromised.

Conclusion: Primary CNS lymphoma often occurs in patients older than 55 years of age. Basal ganglia region is the most common location with diffuse large B-cell lymphoma being the predominant subtype.

Keywords: Non-Hodgkin lymphoma, Large B-cell, Primary central nervous system

EP-0671 [Neuro-oncology » Intrinsic Tumors]

Rabdoid Glioblastoma in a 19 Year Old Female: An Extremely Rare Case

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Rabdoid glioblastoma (rGB) is a poorly prognosed, rarely reported pathologic entity which is a subtype of glioblastoma with rabdoid features. This entity was first described by Wyatt-Ashmead et al. in 2001. Following this pioneer report, 22 reports overall were published so far. A 19 year old woman was admitted to our institution after

a generalized seizure. Cranial MRI revealed a contrast enhanced, multilobulated, partially cystic lesion with perifocal edema in right posterior temporal region. Her initial neurological examination was unremarkable. Diffusion tensor imaging (DTI) studies showed close relationship of the tumor with middle and inferior longitudinal fasciculi (MLF, ILF). Functional MRI detected left hemispheric dominance in speech. Total resection was performed with the guidance of neuronavigation system. The patient was neurologically intact postoperatively and discharged uneventful after 5 days of hospital stay. Postoperative MRI performed 1 month after the operation showed spread of leptomeningeal seeding. Microscopically, an infiltrating tumor arising from the white matter, extending to the cortex with geographic necrosis was observed. The tumoral cells were widely differentiated from rabdoid cells with wide eosinophilic cytoplasm and eccentric nuclei to pylocytic astrocyte-like cells. Immunohistochemically, GFAP, P53 and IDH-1 were positive. Rhabdoid cells were negative for integrase interaction 1 (INI-1) protein. This case report is aimed to contribute to the literature on surgical, clinical, pathological and genetic aspects of rGB. Since rGB has been known to have poor prognosis despite aggressive treatment, future studies are needed to comprehend the pathogenesis of the disease.

Keywords: Rabdoid, Glioblastoma, Neurooncology, Neuropathology

EP-0672 [Neuro-oncology » Intrinsic Tumors]

Intraoperative Neuronavigation System and Ultrasound for Brain Tumor Surgery: Experience in Our Institution

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Those tumors brain constitute a problem really complex for the most of them professional dedicated to its diagnosis and treatment. Constitutes a challenge scientific, ethical and so emotional for the neuroradiologist, oncologist and neurosurgeon. Is have developed new methods of display neuroradiological not invasive as tractography, neuronavigation, ultrasound during the surgery that has allowed improve the resection surgical of those tumors brain, being this a factor forecast fundamental for the survival of the patient. In this presentation we will mention our experience in the use of the system of neuronavigation and ultrasound intraoperative in 30 patients, as well as a comparative analysis with the same number of patients was only used neuronavigation and without any means of intraoperative images respectively, with special reference to the extent of surgical resection and survival free of disease. Our results confirm that the use set of these two means of neuroimaging would improve the degree of resection surgical of tumors intra-axial further to the 92 %. and disease-free survival greater than 14 months in 85% of patients with high-grade gliomas. In none of the cases with cerebral metastasis presented tumor recurrence at the site of surgery, Although the majority of them tumors included in our studies were gliomas, believe that the finds is apply to others tumors brain, as well as to other injury brain that require the navigation intraoperative.

Keywords: Intraoperative neuronavigation, Ultrasound, Brain tumor surgery

EP-0673 [Neuro-oncology » Intrinsic Tumors]

Malignant Transformation of DNETs, a Case Report and Review of 15 Published Cases

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Dysembryoplastic neuroepithelial tumors (DNET) have traditionally considered to be rare lesions with a benign clinical and pathological course, found in children and young adults with pharmaco-resistant chronic epilepsy which are curable with surgery alone. We present a 21-year-old man with history of epilepsy for 9 years which Medical treatments had not resolved seizures. In 2009 a temporal cortical lesion was revealed in brain MRI. Epilepsy diagnostics were indicated that that the mass is epileptogenic. The patient underwent operation and tumor was resected totally. The tumor was characterized as a DNET through histopathology. The patient was followed- up yearly with serial MRI and during this time he had not any seizure after surgery. After 6 years, his brain MRI revealed a new contrast-enhancing tumor at the site of previous operation. The tumor was resected and proven to be a glioblastoma. Herein, we describe this case as malignant transformation of DNET and compile 15 cases published previously with common history. We reviewed the histopathologic, anatomic and surgical characteristics of these 16 patients to discover the risk factors of malignant transformation. Our study showed that the patients with DNETs in extratemporal regions, complex molecular subtypes of DNETs and those in which the tumor was not completely resected has higher risk for malignant transformation and may need closer follow-up than the others.

Keywords: Seizure, DNET, Epilepsy, Extratemporal

EP-0674 [Neuro-oncology » Intrinsic Tumors]

Contribution of Intraoperative Electrostimulation Mapping for Glioblastoma Surgery in and Around Motor Cortex: Comparative Study in a Single Institution

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Background: Intraoperative electrostimulation mapping of the motor cortex and corticospinal tract has become a modern technique for surgery of motor-eloquent lesions. The aim of our study was to evaluate the contribution of intraoperative electrostimulation mapping in functional outcome, extent of resection and survival.

Method: At our institute, we started intraoperative electrostimulation mapping and monitoring for brain tumor surgery in 2014. This retrospective study include 57 patients with motor-eloquent glioblastoma who underwent conventional method without mapping from 2008 to 2013 and 13 patients who underwent resection surgery with intraoperative electrostimulation mapping from 2014 to 2015. We describe the technical aspects and outcomes of motor-eloquent Glioblastoma between resection surgery with and without intraoperative electrostimulation mapping.

Results: Postoperative additional neurological deficit was significant less in mapping group (7.7% versus 22.8%). Gross total resection was achieved significantly higher in mapping group (69.2% versus 29.8%; $p=0.012$). Extent of Resection ratio was also significant higher in mapping group ($88.46\pm 8.20\%$ versus $65.95\pm 35.99\%$; $p=0.001$). Overall survival time and median progression free survival time were significantly longer among patients in mapping group (OS: 22 versus 16 months; $p=0.046$)(PFS: 22 versus 8 months; $p=0.024$).

Conclusion: This comparative study demonstrates intraoperative electrostimulation mapping play an important role for Glioblastoma surgery in and around motor cortex with better functional outcome, greater extent of resection, and longer overall survival/progression free survival.

Keywords: Intraoperative mapping, Motor-eloquent glioblastoma, Cortical stimulation mapping, Motor evoked potential

EP-0675 [Neuro-oncology » Intrinsic Tumors]

Association of C-Reactive Protein Levels with Headache in Patients with Brain Gliomas

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Background: Headache is a frequent symptom in brain gliomas. Despite well-known role of inflammation in promotion of pain, association between C-reactive protein (CRP) levels, a widely used non-specific marker of inflammation, and headache intensity in glioma patients, has not been studied yet. The aim of this study is to assess association of preoperative levels of CRP with headache in patients with gliomas and to evaluate such clinical factors with potential impact on headache as age, gender, BMI, arterial hypertension, tumor proximity to functionally eloquent areas, Karnofsky performance score (KPS), dislocation of median brain structures, malignancy grade, leucocyte and platelet count.

Method: 140 patients with brain gliomas surgically treated in 2013-2016 at the National Center for Neurosurgery (Kazakhstan) were included in the study. Statistical analyses were performed using STATISTICA 7.0.

Results: A significant association with headache was found for CRP analyzed as continuous variable (one-way ANOVA: $p=0.02$) and as categorical variable with a cutoff point of 5 g/l (Fisher's exact test: $p<0.0001$). The tumor proximity to eloquent areas (based on the Sawaya scale) and KPS were also significantly associated with headache ($p=0.03$). Search for an association between headache and the set of studied parameters was carried out using a stepwise discriminant analysis. After stepwise exclusion of the least informative variables, four parameters (CRP, Sawaya, PSK and BMI) were retained ($p=0.0003$).

Conclusion: CRP can be used as predictor for headache in patients with glioma. The present findings suggest more differentiated approach to the choice of strategy in the treatment of glioma patients with headache.

Keywords: Headache, Glioma, Inflammation, CRP, BMI, KPS

EP-0676 [Neuro-oncology » Intrinsic Tumors]**New Synthetic Peptides Derived from Honey Proteins in Glioma Control (Pre-Clinical Study)**Khaled M E Elawdan¹, Youssof K M Elawdan²

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In spite of advancements in all types of malignancy control like surgery, chemotherapy, radiotherapy and immunotherapy, as well as presence of many peptides in the market for cancer control, prognosis in many types of cancer as glioblastoma still very poor. It is enough for anybody to have a look at the main causes of death in any country to know that cancer is one of them and to discover how the challenge and defect in its treatment. Many researches aims were just to improve the already present methods. Anyhow, I think we must introduce something new rather than just thinking of improvement of conventional methods to overcome this challenge. Here we introduce something new in the form of synthetic peptides derived from honey proteins-were discovered by the authors- that may overcome this challenge through direct apoptotic action and not only limited to one tumor cell line.

Patent: WO/2014/040605A1

Patent: US/2015/0291663A1

Patent: CN/105283198A

In vitro studies showed inhibitory effects for those peptides upon 17 different tumor cell lines out of 18 cell lines; U87MG (glioblastoma), MDA-MB-468, K562, A375, MG63, SH-4, RD, KP1, 5637, 2774, ML-1, Cal-27, Colo-205, 769P, EOL-1, HLE, MDA-MB-436 and Calu-3 as well as the case in glioma animal model using U87MG mouse model. Pharmacokinetic study of peptide F using 3 rats showed very short half life. We try to modify peptide F and other peptides to get more potent effects plus safety. So, it is clear how those results could move the field of malignancy especially gliomas management forward.

Keywords: Synthetic peptides, Honey proteins, Glioma control, Pre-clinical study

EP-0677 [Neuro-oncology » Intrinsic Tumors]**Cerebellar Hemangiopericytoma: A Rare Case Report and Review of the Literature**

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Cerebellar liponeurocytoma is rare tumor of the central nervous system, and the clinical characteristics and treatment strategy remain unclear. This rare tumor which is a distinctive entity, classified as a grade II tumor. Cerebellar liponeurocytoma is most commonly found in adults, without gender predominance. In the present study, a case of cerebellar liponeurocytoma was retrospectively reported. A 70-year-old male was referred to the Emergency Department of Bozyaka Training and Education Hospital complaining of occipital headaches, severe nausea and vomiting started suddenly. The patient had a history of diabetes mellitus which was controlled with

a dietary regimen and oral antidiabetics; and Multiple Myeloma. In neurologic examination, broad based gait and dysarthria were seen. Magnetic resonance imaging (MRI) revealed an isointense lesion with a sparse hypointense signal on T1-weighted imaging (WI) and on T2WI, the lesion was slightly hyperintense compared with the cortex. The lesion was ~43×37×33 mm in size, occupying the right hemisphere of the cerebellum compressing the medulla oblongata from the right side. The lesion was well-marginated with an apparent edema and obstructive hydrocephalus was not found. The patient underwent a total resection of the tumor through the midline suboccipital approach. Pathologic examination evaluated as liponeurocytoma. In the post-op neurological examination there were no deficits. In the present study reported a case of cerebellar liponeurocytoma that was successfully treated by total resection. The optimal treatment strategy appears to be a total resection. However, due to the rarity of the tumor and limited data available, long-term follow-up is required.

Keywords: Liponeurocytoma, Cerebellar neurocytoma, Tumor

EP-0678 [Neuro-oncology » Intrinsic Tumors]**Choroid Plexus Papillomas About 14 Cases a Retrospective Study**Kenza Badache, Toufik Benmamar, Nouha Hamrouche, Badra Abzouzi, Farid Bouchenaki, Kamel Bouaita, Nafa Ioualalen
Ehs Ali Ait Idir - Department of Neurosurgery Algiers, Algeria

Background: Choroid plexus papillomas are rare neuroepithelial tumors found mainly in children; its represents 2-5% of all intracranial tumors in children.

Method: This is a retrospective study of 14 cases between January 2010 to December 2016; the age of patients ranging from 3 months to 48 years.

Results: The patients improved in 70% of cases; and 14% of mortality; we had no recurrence in cases with total resection during the period of the study. Choroid plexus papillomas are a rare; benign and intraventricular lesions. It arises wherever choroid plexus tissue exists. Using tractography, fMRI and neuronavigation can minimize the risk of post operative neurological deficits when tumor is close to/in eloquent areas of the brain.

Conclusion: Choroid Plexus Papillomas are intraventricular lesions, histologically benign but highly vascular. The choice of surgical approach differs depending on the location of the lesion. A total resection offers a good prognosis.

Keywords: Papillomas tumor, Ventricular tumor, Surgery, Survival

EP-0679 [Neuro-oncology » Intrinsic Tumors]**Surgical Outcomes of Medulloblastomas: A Serial of Twenty-Six Patients**Anas Abdallah¹, Murad Asiltürk², Talat Cem Ovalıoğlu², Hasan Burak Gündüz², Mustafa Levent Uysal², Erhan Emel², Erhan Özden Sofuoğlu², Betül Güler Abdallah³

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Background: Medulloblastoma is one of the most common malignant brain tumors of primary central nervous system in children. The recommended treatment of this malignant neoplasm is aggressive surgery, followed by craniospinal radiotherapy (RTP) with/without chemotherapy. This study presents surgical outcomes of twenty-six consecutive medulloblastoma.

Method: The patients operated between the years 2000 and 2016, for medulloblastomas at neurosurgery department in BRSHH institution. All patients underwent a craniectomy/craniotomy before neurosurgical tumor removal.

Results: Twenty-six (9 female, 17 male) patients were operated for Medulloblastomas. The mean age was 19.2 ± 13.5 (16months-52years). The most common complaint was headache (69%). The mean clinic course was 2.4 (3days-12months) months. 17 tumors were located in midline whereas 9 tumors in lateral sides. 14 patients received GTR+RTP+ChT, 4 GTR+RTP, 2 NTR+RTP+ChT, 1 STR+RTP+ChT, 4 only GTR and 1 STR. 5-, 10-year OS rates were 76.9% and 65.4%. 5-, 10-year PFS rates were 57.7% and 50%. 12 patients were experienced hydrocephalus; 8 of them were treated with VP shunts while 4 patients were treated with EVD and no needed to shunting. Recurrence rate was 27%. The mean hospital stay was 10.52 days. The most common pathological subtype was desmoplastic which detected in 21 patients, one classic and other anaplastic whereas 3 patients were no otherwise specified. 1-year recurrence rate was 8.3%, and 5-year rate was 20.8%. 5-year dissemination rate was 20.8%.

Conclusion: According to our results 5-year PFS was GTR+RTP±ChT ($P=0.003$, $OR=0.05$). Medulloblastomas in children were located in midline and in adult patients were located in lateral sides ($P=0.002$, $OR=0.04$).

Keywords: Medulloblastoma, Gross total resection, Seeding metastasis, Recurrence

EP-0680 [Neuro-oncology » Intrinsic Tumors]

Schwannoma of the Fourth Ventricle: A Case Report and Review of Literature

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Schwannomas are tumors arising from Schwann cells of peripheral nerve sheaths. Intra-cranial schwannomas are being increasingly reported but intra-ventricular schwannomas not associated with any cranial nerves are still a rare entity. We bring to you a case of 62 yr old man who was evaluated for headache, vomiting, neck pain and ataxia. MRI showed a contrast enhancing mass lesion in the floor of the fourth ventricle extending upto C1. Patient underwent a sub-occipital craniectomy and total excision of the tumor was done. A diagnosis of schwannoma was made post-operatively based on histopathology and immunohistochemistry. This is the ninth reported case of a schwannoma of the fourth ventricle. Being a rare entity of the brain the literature available on intra-parenchymal schwannomas are very limited and detailed studies into the etiopathogenesis of the tumor is necessary to understand it and manage it better. Various hypotheses for the unusual location of these tumors and similar cases have been reviewed.

Keywords: Intra-ventricular schwannomas, Fourth ventricle tumors, Intra-parenchymal schwannomas, Posterior fossa tumors

EP-0681 [Neuro-oncology » Intrinsic Tumors]

The Factors Affecting Surgical Outcomes of Oligodendrogliomas

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Background: Oligodendrogliomas are divided into two groups; high grade (III) and low grade (II). Some patients of high grade oligodendrogliomas may survive more than 15 years. This study aims to investigate the factors may affect the surgical outcomes of oligodendrogliomas.

Method: The patients operated between the years 2006 and 2014, for oligodendrogliomas at neurosurgery department in BRSHH institution. All patients underwent a craniectomy/craniotomy before neurosurgical tumor removal. A total of 93 oligodendrogliomas 62 (22F,40M) grade II and 31 (15F,16M) grade III were retrospectively evaluated. The mean ages were 43.36 ± 13.63 and 45.39 ± 12.38 , retrospectively. The mean follow-up periods were 79.64 ± 36.19 and 76.9 ± 22.92 months, respectively.

Results: The most common complaints for grade II were headache(56%), seizure(50%) and hemiparesis/hemiplegia(26%); for grade III were seizure(58%), headache(48%) and hemiparesis/hemiplegia(13%). Locations were the same for both grade [frontal(50%), temporal(22%) and parietal(17%)]. 37.7% of grade II and 80.7% of grade III were received GTR. All patients were received RTP±ChT. 5-year OS rates were 96.7% and 77.4%; 7-year morbidity rates were 9.8% and 9.7%; 7-year mortality rates were 3.3% and 12.9% respectively.

Conclusion: Pathological grade (II: good; III: poor), tumor's location (parietal and temporal: poor), GTR: poor, radiotherapy: poor, chronic diseases such as HTN, DM and SVO: poor, young patient (<30years) and recurrence after GTR (especially in first 6 months) were the factors affected our surgical outcomes and morbidity. Transformation, 1p19q deletion, dissemination, young patient (<30years), recurrence after GTR (in first 6 months) and smoking were poor while GTR and receiving adjust RTP+ChT were good factors affected mortality rate in our series.

Keywords: Oligodendroglioma, Radiotherapy, Chemotherapy, Surgical morbidity, Mortality, Morbidity

EP-0682 [Neuro-oncology » Intrinsic Tumors]

A Rare Case of Quadrigeminal Plate Lipoma Presenting as Sixth Cranial Nerve Palsy

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Intracranial lipomas constitute 0.1% of all intracranial tumors. We discuss a case of quadrigeminal plate lipoma. Intracranial lipomas are uncommon slow growing tumor found incidentally. Our case presented as sixth th cranial nerve palsy. A 19 years boy came to us with the complain of headache, diplopia and visual disturbances since 2 years. There were no history of vomiting, seizures or loss of consciousness. General physical examinations and systemic examinations have normal findings except nervous system where we found diplopia. All laboratory findings were normal. CT head revealed a rounded fat density (density 101) measuring 17.6×20.6mm in the region of quadrigeminal cistern. MRI brain revealed absent corpus callosum and rounded well-defined T1WI, T2WI and FLAIRE hyperintense lesion in quadrigeminal cistern. The lesion causes compression of cerebral Aqueduct resulting in dilation of both lateral and third ventricles making a diagnosis of quadrigeminal plate cistern lipoma with non communicating hydrocephalus. Some important locations of intracranial lipomas are corpus callosum, quadrigeminal cistern, Suprasellar interpeduncular cistern, cerebellopontine cistern, sylvian cistern. The common neurologic findings related to quadrigeminal plate lipomas are raised intracranial pressure and hydrocephalus. Our patient had features of raised intracranial pressure and hydrocephalus which we managed by inserting ventriculoperitoneal shunt. Postoperatively patient's sixth nerve palsy improved, headache, diplopia and visual disturbances subsided and he was discharged with follow up advices. Quadrigeminal plate lipoma occasionally present with hydrocephalus due to aqueductal obstruction which can be managed by cerebrospinal fluid diversion. We did ventriculoperitoneal shunt and our result was satisfactory.

Keywords: Intracranial lipoma, Quadrigeminal plate lipoma, Aqueduct stenosis, Hydrocephalus, Raised intracranial pressure

EP-0683 [Neuro-oncology » Intrinsic Tumors]

Spontaneous Resolution of Non-Functioning Pituitary Macroadenoma - A Lesson Learned: Case Report

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Spontaneous resolution of pituitary adenoma is a rare event, more so in non-functioning macroadenomas. Most cases of spontaneous tumor regression are reported in endocrinally active tumors, with pituitary apoplexy the purported mechanism of tumor destruction. Albeit a rarely seen clinical picture, our case demonstrates the importance of repeat neuroimaging in the setting of symptom development suggesting pituitary apoplexy in patients already known to harbor pituitary tumors. We present the case of a 72 year-old female patient with a known pituitary non-functioning 2.5cm adenoma, for whom surgery was indicated due to suprasellar extension and progressive visual deficit. Hormonal function was normal and she had a incongruent bitemporal hemianopia. She underwent transphenoidal surgery on a routine basis and surprisingly, no tumor was found in the sella, only the pituitary gland surrounded by amorphous material, sent to pathology. MRI was performed the following day, confirming the absence of discernible tumor. Neuropathology disclosed only fibrotic tissue and non recent hematic remnants. On a more detailed and directed

clinical history, the patient disclosed a hitherto unknown episode of violent headache and subjective feeling of visual worsening that had taken place 6 weeks prior to surgery; since the episode was self-limited and the patient recovered well, she made no reference to such episode when she was admitted. In retrospect, this could in all probability have corresponded to pituitary apoplexy, leading to tumor destruction. This case represents a valuable lesson, in which a timely neuroimaging exam could have avoided unnecessary surgery.
Keywords: Pituitary macroadenoma, Spontaneous resolution, Non-functioning pituitary macroadenoma

EP-0684 [Neuro-oncology » Intrinsic Tumors]

A Third Ventricle Arachnoid Cyst Which Presented with a Sudden Loss of Consciousness

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The incidence of arachnoid cysts ranges between 0.2 and 1.7% in adults. Third ventricle-related arachnoid cysts are very rare. Arachnoid cysts in the ventricle may lead to hydrocephalus by compression or by causing obstruction of the foramen of Monro or aqueduct. A 57-year-old male patient was admitted to our clinic with sudden loss of consciousness. In brain computerized tomography (CT) scan and brain magnetic resonance imaging (MRI), a cystic lesion which completely filled the third ventricle and led to dilatation of the lateral and third ventricles was found. The patient underwent external ventricular drainage in emergency conditions. The patient's consciousness was opened on the following day. On the third day of the hospitalization, the patient underwent transcallosal cyst fenestration. The cyst completely obstructed and expanded foramen Monro. Because hydrocephalus did not exhibit regression in brain CT scan and there was a deterioration in Glasgow coma scale (GCS), the patient underwent ventriculoperitoneal shunt. On the next day, the patient's GCS increased to 14. Arachnoid cysts are most often seen in the sylvian fissure and interhemispheric fissure. Intraventricular arachnoid cysts are very rare. They are usually asymptomatic. They can be symptomatic when they make a compression on neuronal structures or when they block the flow of cerebrospinal fluid. Our case had slowly progressive amnesia over the past 2 years. The cyst could be diagnosed when foramen Monro was completely obstructed and hydrocephalus occurred. Treatment of the arachnoid cysts is still controversial. Surgery is necessary when it became symptomatic.

Keywords: Arachnoid cysts, Third ventricle, Hydrocephalus

EP-0685 [Neuro-oncology » Intrinsic Tumors]**Clinical Characteristics and Outcomes of Primary Gliosarcoma: A 12 Years Institutional Experience from Pakistan**

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Background: Primary Gliosarcoma is a rare neoplasm constituting < 0.5% of all primary CNS tumors. We aimed to see its features; our management and outcomes, of this highly malignant tumor.

Method: A retrospective case-series conducted at the Neurosurgery Department, Aga Khan University. Patients were identified by searching the institutes electronic neurosurgical database, a total of 11 cases were identified from 2003 to 2014, MRI/CT scans and histopathology slides were reviewed. Analysis was done on SPSS 20.

Results: The median age was 52 years with a male:female of 8:3. The symptoms included headache 74%, hemiparesis in 45.4%, raised intracranial pressure in 36.3%, seizures, dysphasia in 27.2% and acute hydrocephalus in 9% of the cases. KPS was >70 in 5 and <70 in 6 patients. Six patients had tumor in frontal and five had tumor in temporal lobe. MRI showed hypointense signals in 6, iso-intense in 4 and hyper intense signals in 1 case on T1-weighted images and hyperintense in 9 cases on T2-weighted images. Features of necrosis was seen in 5, hemorrhage in 6 cases. Contrast enhancement was seen in all cases. Gross-total resection was done in 5, Sub-total resection in 4 cases and biopsy in 2 cases. Eight underwent chemotherapy and radiotherapy post- surgery. Recurrence was found in 9 patients, repeat surgery was done in 4 patients. Seven patients died of the disease. The median progression free survival was 4 months, median overall survival was 6.5 months.

Conclusion: We found Gliosarcoma to have a more aggressive behavior.

Keywords: Primary gliosarcoma, CNS neoplasm, Gross-total resection, Recurrence, Overall survival

EP-0686 [Neuro-oncology » Intrinsic Tumors]**Medulloblastoma in an Elderly Patient: Case Report and Literature Review**

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Medulloblastoma is the most common primary malignant neoplasm of the central nervous system (CNS) in children. In adults the occurrence is rare, accounting for less than 1% of all tumor lesions of the CNS. The aim of the present study is to report a rare case in a 74-year-old patient followed by review of the literature. The respective patient presented with symptoms of appendicular cerebellar ataxia and vertigo. Magnetic resonance imaging (MRI) revealed a heterogeneous solid image with gadolinium enhancement in the right cerebellar hemisphere. Patient underwent surgery with complete resection of the lesion, with histopathological and

immunohistochemical diagnosis of medulloblastoma. After broad literature review in Pubmed only 10 cases of medulloblastoma in patients over 65 years of age were identified, being our patient the second oldest. In childhood, presentation with axial ataxia, hydrocephalus due to obstruction of the cerebrospinal fluid flow, solid image located in the midline (usually cerebellar vermis) and worse prognosis are common. In elderly patients ataxia is usually appendicular and associated with hemiparesis, due to tumor's predilection for the cerebellar hemispheres in this group. Since the desmoplastic subtype is more common in this age group than in childhood, they have a more favorable prognosis. Thus, despite the rare incidence, medulloblastoma in elderly patients is an entity that must be recognized, since it has peculiar characteristics that are relevant for the diagnosis and treatment of these patients.

Keywords: Medulloblastoma, Elderly, Cerebellar hemisphere, Ataxia

EP-0687 [Neuro-oncology » Intrinsic Tumors]**Long-Term Surgical and Seizure Outcomes of Frontal Low-Grade Gliomas**

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Background: Low-grade gliomas are infrequent lesions requiring special emphasis because of their relatively long follow-up time, and therefore the need for patients' well-being. Surgery provides not only increased survival but also improved quality of life for these patients. The purpose of this study was to present surgical series of frontal low-grade gliomas that were operated in our clinic and to discuss their epileptic and functional outcomes.

Method: A series of 40 patients with low-grade glioma (WHO Grade II) were retrospectively analysed for patient characteristics, tumour location, epileptic history, surgery type (awake craniotomy, general anaesthesia), extent of resection and complications.

Results: Tumour was localized to primary motor area in most of the cases (35%, n = 14), 25 patients were operated under general anaesthesia and 15 with awake craniotomy. New deficit rate in the early postoperative period was 32.5% (dysarthria in one patient and motor deficits in 12). Karnofsky scores were ≥90 in 92.5% of the patients at the late follow-up. 31 patients were Engel I (77.5%), 5 were Engel II (12.5%) and 4 were Engel IV (10%) postoperatively.

Conclusion: Frontal LGGs are eligible to resect vigorously without persistent functional deficits. Patients with immediate postoperative complications benefit from neuro-rehabilitation. However, pre-existing speech dysfunctions are hard to recover with surgery. Surgical resection ends with favourable epileptic outcomes whereas tumour location may influence the results.

Keywords: Epilepsy, Frontal, Glioma, Low-grade, Outcome

EP-0688 [Neuro-oncology » Intrinsic Tumors]**Intraventricular Castleman's Disease**

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Castleman's disease is rare, benign lymphoproliferative disorders which usually arises in mediastinal lymph nodes. It was first described by Benjamin Castleman in 1956. CD has been divided into three subtypes such as hyaline-vascular type, plasma cell type, and multicentric (systemic) type. The most common subtype is hyaline vascular type which is characterized by structural abnormal lymphoid follicles with aberrant networks of follicular dendritic cells. In literature CD have been reported mediastinal lymph nodes, pericardium, lung, larynx, vulva, tymus but intracranial CD is very rare. Dural CD and leptomeningeal CD have been reported but intraventricular has been not reported. This is only first case of Castleman's disease presenting as a intraventricular mass. A 38 year old male with a history of epileptic attack was referred our hospital. His physical and neurological examinations were normal. Cranial magnetic resonance imaging revealed a mass in left posterior part of the lateral ventricles with huge edema. At operation, a left sided parietal craniotomy and totaly tumor excision were performed. Histopathological result was reported Castleman's disease-hyaline vascular type. The patient was discharged uneventful. Castleman's disease presenting as a intracranial mass lesion is extremely rare. Localized Castleman's disease is usually cured by surgical excision of the mass.

Keywords: Castleman's, Intraventricular, Disease

EP-0689 [Neuro-oncology » Intrinsic Tumors]**An Unusual Variant of Ependymoma with Extensive Tumor Cell Vacuolization**

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Ependymomas are the most common, slow-growing neuroepithelial tumors of brain and spinal cord. The World Health Organization classifies ependymomas as ependymoma (with cellular, papillary, clear cell, and tanycytic variants), anaplastic ependymoma, myxopapillary ependymoma, and subependymoma. Additionally, rare histological variants are recognized as ependymoma with lipomatous differentiation, giant cell ependymoma, ependymoma with extensive tumor cell vacuolization, melanotic ependymoma, signet-ring cell ependymoma, ovarian ependymoma, ependymoma with neuropil-like islands. We report a case of ependymoma with unusual vacuolar features originating in between medulla oblongata

and upper servical spinal cord. A 51 year old male with a history of the developed symptoms of progressive numbness in lower extremities was referred our hospital. His physical and neurological examination were normal. Magnetic resonance imaging showed an intramedullary tumor of between the medulla oblongata and the upper cervical cord with cystic component and mural nodule, T1-isointense and T2-hyperintense, suggesting the diagnosis of pilocytic astrocytoma or hemangioblastoma. The patient underwent surgery for total tumor excision via suboccipital craniotomy. In histopathologic investigations, the tumor was composed of cells with multiple cytoplasmic vacuoles. Diagnosis confirmed an unusual variant of ependymoma with extensive tumor cell vacuolization. Postoperative course was uneventful. Our case represent an unusual type of ependymoma. The cases treated with total surgical resection show a favorable prognosis like the classical ependymoma.

Keywords: Ependymoma, Tumor, Vacuolization

EP-0690 [Neuro-oncology » Intrinsic Tumors]**Calcified Pseudoneoplasm of the Brain**

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Calcified pseudoneoplasm of the neuroaxis (CAPNON) is very rare, calcified, benign pathology. It was first described by Rhodes and Davis in 1978. CAPNON can occur anywhere within the neuroaxis. The report aims to discuss a case of intraaxial calcified lesion in the frontal lobe. A 61 years old, female presented with progressive headache. Physical and neurological examinations were normal and she was in good clinical condition. Magnetic resonance imaging showed nonhomogenous mass, hypointens on T1 weighted images, hyperintens signal on T2 weighted images mass that originate right frontal lobe and extension into the frontal bone. The patient underwent a right frontal craniotomy and gross total resection of the calcified mass. Histopathological diagnosis confirmed as a calcified pseudoneoplasm of the neural axis. Postoperative course was uneventful. In the presence of calcified intracranial lesion CAPNON should be considered in the differential diagnosis. CAPNON is usually cured by surgical excision.

Keywords: Calcified, Pseudoneoplasm, Brain

EP-0691 [Neuro-oncology » Intrinsic Tumors]**Time Trends of Brain Tumors Over a Three-Decade Period: Age at Diagnosis, Gender and Histological Type**

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Aim: To investigate the time trends of brain tumors with respect to gender and histological type distribution and age at diagnosis at Jordan University Hospital (JUH) over the 1982-2011 period.

Method: Patients' records from JUH Department of Neurosurgery between 1/1982 and 12/2011 were reviewed for all cases with the histological diagnosis of brain tumor. Gender and histological type distribution and age at diagnosis of brain tumors and their time trends were determined.

Results: A slight male predominance (52%, $P < 0.05$) was found for the entire study period and for all tumors combined with more pronounced male predominance for glioblastoma, anaplastic astrocytoma, oligodendroglioma and arachnoid cyst. Meningioma and pinocytoma showed female predominance ($P < 0.05$). Relative frequency of all histological types was stable over the 30-year period except for anaplastic astrocytoma. Mean age at diagnosis for the study population was 35.2 years. Age at diagnosis was stable for almost all histological types over time.

Conclusion: This study demonstrates a remarkable stability of the various brain tumor types in Jordanians with respect to gender and histological type distribution and age at diagnosis over a long time period. This information is valuable for a better understanding of brain tumors.

Keywords: Brain tumor, Jordan, Neoplasm's, incidence, Central nervous system, Trends

EP-0692 [Neuro-oncology » Intrinsic Tumors]

Diagnosis of Anaplastic Ependymoma

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Ependymomas are relatively rare tumors of the central nervous system. Particularly, Anaplastic Ependymomas are even rarer. In this study; we aimed to reevaluate the Anaplastic Ependymomas along with the current diagnostic approaches and the literature. Seven cases diagnosed as Anaplastic Ependymoma in our laboratory between 2008 - 2017, were included in our study. These cases were reevaluated histopathologically and differential diagnosis was revised comparing the clinical and prognostic features. The six patients were males. 5 of them were pediatric. 3 of the pediatric patients were under 3 years of age. Tumors were located intracranially in all the patients. The tumors were located in the cerebral hemisphere in 2 adult patient. Tumors in 2 of the pediatric patients were supratentorial, in 3 of the patients were infratentorial. Average tumor diameter in the patients was 3,5 cm. In two of the pediatric patients, recurrence with 7 - 8 months interval history. Sclerularity, nuclear anaplasia and increased mitotic index was existing in all patients whereas in limited - focal area in 3 cases. Average mitotic index in hot point was 9/10HPF. Subjective histological grading and heterogeneous histological properties were stated to be inadequate for survey determination in the literature. Unfavorable prognosis is predicted with tumor localization, existence of tumor residue and in children under 3 years of age. Similarly, we found tumors were localized in the cerebral hemisphere in the two pediatric cases with recurrence. In the recent literature, the molecular subgroup of the tumor emphasized to be closely related to the prognosis.

Keywords: Ependymoma, Anaplastic, Grade III

EP-0693 [Neuro-oncology » Intrinsic Tumors]

Double Localisation of Ganglioglioma (Spine and Cerebral): Case Report and Literature Review

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27 yo male presented with a 3 week history of diffuse rachialgia with sciatalgia and numbness of the right leg. Physical examination found a motor neurological deficit allowing him to walk. The medullary MRI revealed a heterogenous enhancing centrally located spinal cord mass involving T8 through T11, enlarging the spinal cord. The patient underwent a T9-T10 laminectomy for tumor biopsy and debulking. The histology revealed at that time a WHO grade I pilocytic astrocytoma. He was dismissed with the same neurological status. He presented 2 months after surgery with headache, dizziness, trouble of the walk. The CT showed a hydrocephalus, a shunt was performed in another center. The neurological examination in our center found a cerebellar syndrome with a right mono crural paresis. The MRI showed multiple solid and cystic cerebellar lesions well limited with the biggest in the vermis (32mm), compressing the 4th ventricle. We then performed a stereotaxic biopsy. The anatomopathological examination revealed a ganglioglioma grade I. We performed a 2nd anatomopathological lecture of the medullary tumor which confirmed the diagnosis, expressing Olig2, chromogranin A and synaptophysin A positive, H3 K27M negative. Gangliogliomas are low-grade glial-neuronal neoplasms that occur most commonly in the temporal lobe of pediatric or young adult patients. The subtentorial localisation is unusual. Approximately 3% of all GGs are primary to the spinal cord. Intracerebral, leptomeningeal, and intraventricular spread from primary spinal cord GG is exceedingly rare. We report here a rare case of a double localisation of ganglioglioma.

Keywords: Ganglioglioma, Subtentorial, Spinal

EP-0694 [Neuro-oncology » Intrinsic Tumors]

Keyhole Suboccipital Approach for Management of Pineal Region Tumors

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Background: Tumors of the pineal region constitute > 1 % of brain tumors. due to deep location of the pineal region and close vicinity to vital neural and vascular structures make it challenging target for neurosurgeons. Many surgical approaches were described for management of these tumors, the infratentorial supracerebellar approach is the most used approach. minimally invasive approaches and the use of endoscopic assisted microsurgical technique improve the outcome in most of transcranial surgery including the pineal region tumors.

Method: 14 patients with pineal region tumors were operated in the last 8 years using this approach; 8 males and 6 females, age ranged from 16 - 48 years. Most common presenting complaints were headache and gaze disturbances.

Results: Total excision was achieved in 12 patients. 3 patients developed transient postop. Parinaud's syndrome, one needed V.P shunt.

Conclusion: The tumors of the pineal region represent a significant challenge for surgical management due to deep location and critical structures around it. minimally invasive approach and the use of endoscopic assisted microsurgery make surgical excision of tumors of the pineal region safe and effective in comparison to standard microsurgical technique with less approach related morbidity.

Keywords: Tumor, Pineal region, Endoscopy

EP-0695 [Neuro-oncology » Intrinsic Tumors]

Low Grade Glioma Occurrence a Decade Following Radiotherapy for Scalp Squamous Cell Carcinoma: A Case Report and Literature Review

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Malignancies are known to occur after Radiation exposure. Despite the fact that clinical irradiation for therapeutic and diagnostic purpose is well gauged but it also remains hazardous with many malignancies reported to occur after clinical radiation exposure in different parts of the body. Intracranial induced gliomas after extracranial radiation exposure is very unusual entity of radiation induced brain lesions. Forty-nine years old female was diagnosed with squamous cell carcinoma of skin behind the ear, underwent surgical excision and received radiotherapy 10 years ago. She presented to neurosurgical casualty with confusion, partial seizures which was aborted spontaneously and slurred speech started several hours before admission. She was confused on examination, had slurred speech and anisocoria. MRI brain with contrast was done and showed left sided temporal space occupying lesion with infratentorial extension with obvious uncus herniation and midline shift. Patient admitted and received initial doses of dexamethasone and anti-epileptic drug, later on operated upon and histopathology revealed low grade glioma, consequently patient was diagnosed as having radiation induced glioma. Patient condition improved eventually and she was discharged in good condition, sent to oncology department for further management. Although extremely rare radiation induced gliomas are well defined in neuro-oncological literature, they impose a great diagnostic and therapeutic difficulties. This is because their clinical and radiological features may resemble radiation associated gliosis, and the therapeutic decision may be very hard to be taken specially taking into consideration the fear of what is called cumulative neurotoxicity.

Keywords: Radiation-induced glioma, Skin squamous cell carcinoma, Extracranial radiation exposure

EP-0696 [Neuro-oncology » Intrinsic Tumors]

Intracranial Intraventricular Tumors: Long-Term Surgical Outcome of 25 Patients

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Aim: To provide the long-term surgical outcome of patients with intracranial intraventricular tumors.

Method: Twenty-five patients operated on for intraventricular tumors between June 1999 and June 2014 are reviewed. Data from before, during, and after surgery were obtained from the patients' files and patients were followed regularly after surgery.

Results: The group of patients comprised 15 females and 10 males with a mean age of 31.6 ± 16 years. The majority were adults and only 3 children were included. Three, 4, and 18 patients had tumors in the 4th, 3rd, and frontal horn of the lateral ventricles, respectively. All patients showed a varying degree of hydrocephalus and headache was the most common presenting symptom. Overall, central neurocytoma was the most common pathological diagnosis. Complications were found in only 4 patients and, in long-term follow-up, 3 patients had died due to the malignant nature or upgrading to a malignant tumor and the rest were alive.

Conclusion: Total removal of the intraventricular tumor increases survival because the majority of these tumors are benign and slowgrowing. The type of surgical intervention should be chosen according to the location of the tumor in the ventricular system.

Keywords: Intraventricular tumors, Long-term, Transcallosal, Transcortical, Follow-up, Ventricle

EP-0697 [Neuro-oncology » Intrinsic Tumors]

Serum Endocan Levels Before and After Surgery on Low-Grade Gliomas

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Background: Endocan has been shown to be a marker for several cancers and may show degree of malignancy. The aim of this study is to assess serum levels of endocan before and after surgery on low-grade gliomas (LGGs).

Method: Endocan was assayed by commercially available enzyme-linked immunosorbent assay (ELISA) kits in a total of 19 patients and 12 controls. Serial serum samples were obtained before and after surgery (1st day, 1st week, and 1st month of surgery). Control samples were collected from cord blood during cesarean section. The results were compared with control brain tissues.

Results: Controls showed significantly lower serum endocan levels

compared to before and after surgery ($P < 0.05$). There is a trend of increase in mean serum levels from before surgery and during the very early period after surgery (during first week); however, in the first month, mean serum levels became lower.

Conclusion: Endocan, a vital molecule for angiogenesis, is highly expressed before and after surgery in LGGs, but long-term data is needed. Furthermore, future studies should include high-grade gliomas to discuss whether endocan is associated with recurrence and response to treatment.

Keywords: Brain tumor, Cancer, Endocan, ESM-1, Glioma, Low-grade gliomas

EP-0698 [Neuro-oncology » Intrinsic Tumors]

Meningioma Revealed by Cerebral Hematoma; Case Report and Review of the Literature

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Spontaneous intracerebral hemorrhage rates in patients with primary brain tumor range from 1.4% to 10.0% in the literature. These hemorrhages occur rarely in benign tumors such as meningioma. The authors present the case of a meningioma revealed by an intracerebral hematoma with a review of the literature. Fifty years old patient presented with sudden left hemiparesis followed by conscious alteration. The cerebral CT and MRI concluded to a Rolandic hematoma associated to a subarachnoid hemorrhage. An emergent surgery was performed. The evacuation of the hematoma revealed intra operatively a tumor mass. Histological examination concluded to a meningioma. Meningiomas are rarely revealed by bleeding; Only 68 cases have been reported in the literature. Different types of hemorrhage can occur: subarachnoid, subdural, intratumoral, intracerebellar or intraventricular hemorrhage. The physiopathological origin of the bleeding associated with meningioma is still unclear. Most of these meningiomas are grade II or III sub types.

Keywords: Meningioma, Hematoma, Cerebral, Surgery

EP-0699 [Neuro-oncology » Intrinsic Tumors]

A Rare Case of Craniopharyngioma

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Craniopharyngioma, which is a benign brain tumor, usually located in the suprasellar region of the brain, adjacent to the pituitary gland and optic nerves. Clinically presents with the symptoms of visual loss, hormonal disorders, and headache. A 47-year-old woman presented with a 9-months history of progressive bilateral temporal visual acuity. There was no significant disease in his past medical and family history. His neurological examination was normal, except for the vision in the right eye was 6/10 and bitemporal hemianopsia on visual field examination. His cranial magnetic

resonance imaging (MRI) revealed a massive pituitary mass on the transsphenoidal location. On pituitary MRI, a 2x2.5 cm diameter mass lesion with a peripheral contrast enhancement was detected. Routine laboratory findings and the prolactin level (14.03 ng/ml, N:10-50) of the patient were within normal limits. Our patient who was diagnosed as craniopharyngioma was directed to surgical treatment. The definitive diagnosis of craniopharyngiomas is made by neuroradiological studies. Computed tomography shows a calcifying tumor in the supracellar region. MRI reveals the entire size of the tumor, its content, and its proximity to the brain and these tumors often show contrast enhancement. The location of the tumor determines the which surgical approach method will be chosen. Hormonal laboratory findings may be useful in distinguishing between craniopharyngioma and the other brain tumors. Here we presented this case to emphasize the importance of better recognition and differential diagnosis of the brain tumors in this location.

Keywords: Craniopharyngioma, Visual acuity, Surgical treatment

EP-0700 [Neuro-oncology » Intrinsic Tumors]

Atypical Imaging Features of a Posterior Fossa Dermoid Cyst

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Intracranial dermoid cysts are uncommon lesions with characteristic imaging appearances. Symptomatic clinical presentation usually occurs in one of two ways: mass effect or rupture. Radiologically, dermoid cysts typically present as low density masses on CT scan and are generally hyperintense on T1-weighted MRI sequences with variable signal on T2-weighted sequences. The authors present a case of a 35 year-old female presented with symptoms of increased intracranial pressure. Radiological investigations showed a cystic posterior fossa tumor that was not only hyperattenuating on CT scans but also hypointense on MRI T1-weighted images. The patient underwent a total-gross resection of an extra-parenchymal posterior fossa tumor. Pathologic examination of the specimen concluded to dermoid cyst.

Keywords: Dermoid cyst, Posterior fossa, CT, MRI

EP-0701 [Neuro-oncology » Intrinsic Tumors]

More Than 13 Years Survival at a Frontal Grade 3 Ganglioglioma

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Gangliogliomas are rare, epileptogenic tumors and constitute almost 1.3% of all primary brain tumors. They may grow up from both neuronal and glial elements. They may occur anywhere in central nervous system. But especially found in temporal lobe. They most frequently affect children and young adults, with a slight male predominance. Generally these tumors benign natured but up to 5% of all gangliogliomas are anaplastic characterised. A 20 year old male admitted to emergency because of seizure. On the contrast

enhanced MRI (Magnetic Resonance Imaging) of the patient, a tumor that 50x45x55 mm in size in right frontal lobe. The patient was operated when him clinically stable. After a right frontal craniotomy total tumoral lesion excision was done by microsurgical procedure. No deficits were observed in the postoperative neurological examination. The end result of the pathology was Ganglioglioma WHO Grade 2-3. Postoperative contrast enhanced MRI showed no enhancing tumoral lesions. He underwent 50 G radiotherapy in early postoperative period. He followed up annually by contrast enhanced MRI and neurological physical examination. Since 13 years from operation there is no recurrence on contrast enhanced MRI. He has no cognitive or neurological problem and successfully completed his education. The ganglioglioma surgery principle is based on total excision. Radiosurgery also can be considered for residual or recurrent tumors. Radiosurgery or postoperative radiotherapy may perform in high grade or anaplastic ones of these tumors. We believe performing all these treatments will increase the survival.

Keywords: Ganglioglioma, Survival, Anaplastic, Surgery

EP-0702 [Neuro-oncology » Intrinsic Tumors]

A Tragical Paediatric Case History of Intraorbital and Intracranial Epithelioid Hemangioendothelioma

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Epithelioid hemangioendothelioma (EHE) is a rare vascular tumor that represents a transitional histology between a well differentiated hemangioma and anaplastic hemangiosarcoma. The term epithelioid hemangioendothelioma was proposed firstly by Weiss and Enzinger in 1982. EHE occurs usually in the lung, liver, and long bone. Cranial EHE is very rare. The tumor can occur at any age and does not show sexual predominance. We report of an illustrative case of a 3 years old girl harbouring primary intra cranial hemangioendothelioma and we describe the clinical history and radiological and pathologic features of this rare entity. A 3 year-old girl without pathological antecedents presents with a one month history of exophthalmia with signs of raised intracranial pressure. Physical and neurological examination revealed exophthalmia without any vascular sign, a convexity of the palate, and temporal optical atrophy. Axial and coronal CT scan through the orbit with contrast showed an endoorbital tumor involving optic nerve spreading to the cavernous sinus.

Keywords: Hemangioendothelioma, Hemangiosarcoma, Hemangioma

EP-0703 [Neuro-oncology » Intrinsic Tumors]

Pleomorphic Xanthoastrocytomas About 4 Cases

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We report 4 cases of Pleomorphic Xanthoastrocytomas that have been recorded, in the period ranging from January 2010 to December 2016, as well as a review of the literature. We found 75% of the cases are men for 25% of women; 75% children and 25% adults,

with an age that varies from 07 to 23 years. 100% of the cases were manifested by signs of intracranial hypertension without associated neurological deficit. All patients have undergone a radiological exploration (MRI and Cerebral Scanner). All our patients were operated on, and 75% had a recurrence after one year. Pleomorphic Xanthoastrocytomas are a low grade glial tumor, representing 0.5 to 1% of all central nervous system tumors. They are found mostly in adolescents and young adults, with an average age at diagnosis of 12 years. They develop from glial cells supporting the CNS (astrocytes). Its most frequent localization is cerebral hemispheric, but it can be found at the spinal level. Often confused with glioblastoma, but they have a better prognosis. Nevertheless, malignant transformation is described in 20% of cases. Treatment is based on neurosurgery and radiotherapy. Pleomorphic Xanthoastrocytoma is a rare benign tumor, accounting for less than 1% of all central nervous system tumors. It involves the grandchild and the young adult. During the past six years we have seen four cases in our department, of which we report the evolution.

Keywords: Pleomorphic xanthoastrocytoma, Young child, Surgery

EP-0704 [Neuro-oncology » Intrinsic Tumors]

A Rare Location of Glioblastoma

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Glioblastoma is the most common primary CNS malignancy which is mostly located in the supratentorial area. Its intraventricular and infratentorial placement is very rare. Our case is a 66 year old woman with dizziness and nausea for 4 months. An MRI scan showed a mass lesion in the fourth ventricle without hydrocephalus. The lesion looked like an ependymoma due to its situation, diffuse contrast enhancement and well limited borders. A surgery was performed and a subtotal removal was achieved due to cerebellar peduncle invasion. Pathology report showed grade IV glioma. This is the second glioblastoma case ever mentioned in English literature that is situated in the fourth ventricle and it shows that glioblastoma can mimic every tumor in the CNS.

Keywords: Glioblastoma, 4th Ventricle, Malignancy

EP-0705 [Neuro-oncology » Intrinsic Tumors]

Survival Analysis in Elderly Patients with High Grade Gliomas: The Influence of Clinical Status, Tumor and Surgical Features

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Background: High grade gliomas (HGG) are malignant neoplasms, notorious for its poor prognosis. Managing elderly patients with this condition is challenging. We conduct a survival analysis in a sample of elderly patients with high grade gliomas. We evaluate the impact of age, Karnofsky scale (KS), tumor localization and occurrence of post operative complications.

Method: The study sample consisted of patients with high grade gliomas consecutively admitted from January 2014 to January 2016 (24 months) at Hospital do Servidor Público Estadual de São

Paulo (HSPE). We enrolled patients in the study and followed them during treatment for HGG.

Results: Forty six patients presented with HGG during 2 years of evaluation. In our analysis, we confirmed that age, KS, localization of tumors and complications during treatment are factors related to survival. Patients older than 70 years, with low KS, tumors deeply situated or multilobar and patients with complications had worst outcomes. Additionally, complications not only decreased survival but increased interval to begin adjuvant therapy.

Discussion: The elderly are a heterogeneous population with a range of comorbid conditions and functional, cognitive and physiological changes, and treatment decisions should be made in the context of a comprehensive assessment. Elderly patients with high KPS (>70) and few comorbidities should be submitted to full treatment, as long as chemotherapy or radiotherapy are options to patients with high surgical risk.

Keywords: Gliomas, Elderly, Surgery, Complications

EP-0706 [Neuro-oncology » Extrinsic Tumors]

Orbital Epidermoid Cyst: Case Report and Literature Review

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Orbital epidermoid cysts form a rare pathological entity. They have variable clinical and radiological presentations and they should be considered in the differential diagnosis of orbital cystic lesions. In this report we describe the case of a 36-year-old male patient with an orbital epidermoid cyst revealed by slowly progressive right exophthalmos and extraconic homogenous hypodense masse without enhancement in CT scan. The lesion was removed by anterior orbitotomy and The histological examination confirmed the diagnosis. We discuss the clinical and radiological aspect of this entity through a literature review.

Keywords: Orbit, Epidermoid cyst, Ct, MRI, Surgery

EP-0707 [Neuro-oncology » Extrinsic Tumors]

Trapezius Flap Reconstruction of Scalp Defect After Removal of Occipital Fibrosarcoma in Neurofibromatosis Type I Patient

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Neurofibromatosis type 1 (NF1) is an autosomal dominant condition affecting around one in 3000 live births. The manifestations of this condition are extremely variable, even within families, and genetic counseling is consequently difficult with regard to prognosis. Individuals with NF1 are acknowledged to be at increased risk of malignancy. Several studies have previously attempted to quantify this risk, but have involved relatively small study populations. Soft

tissue tumors represent a heterogeneous group of mesenchymal and neural lesions. We report a case of giant Fibrosarcoma of the scalp in patient with neurofibromatosis type I without intracranial extension, in a 35 year old female which was excised completely along with the involved overlying skin, and reconstruction was done to cover the defect using trapezius flap and split thickness skin graft from the right thigh. She is doing well after treatment and is in regular follow up while awaiting for further management by the oncologists.

Keywords: Neurofibromatosis type I, Fibrosarcoma, Trapezius flap, Scalp defect

EP-0708 [Neuro-oncology » Extrinsic Tumors]

Multimodal Management in Giant Supratentorial Meningioma

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The meningiomas are hypervascularized tumors, with a bimodal pattern of irrigation. The extent of resection (Simpson scale) is the main factor that determines the recurrence and pronostic of the patient. We present the case of a 58 year old female, who had a sudden neurological deterioration at her arrival to our hospital she presented with 8 points in the Glasgow coma scale and generalized seizures. CT scan showed a supratentorial left extra axial lesion with deviation of the midline elements, so the patient was taken to the operating room, we performed a decompressive left hemicraniectomy and she was admitted to the ICU. 4 days after that angiography showed a left meningioma which was embolized with microparticles through the meningeal artery. 2 days after that we did the tumor resection guided with neuronavigation and transoperative ultrasound (sonowand invite®). The histopathological report was meningioma meningothelial. 90% resection was achieved, and the transoperative bleeding was 1000 ml. In this case we performed a multimodal management for a giant supratentorial left meningioma. First the tumor was embolized with microparticles, and then we performed a tumoral resection guided with the neuronavigational system and transoperative ultrasound. Preoperative embolization continues to be a valuable adjunct to surgical resection for selected intracranial meningiomas.

Keywords: Embolization, Meningioma, Neuronavigation

EP-0709 [Neuro-oncology » Extrinsic Tumors]

Surgical Management of Olfactory Groove Meningiomas in University Sumatera Utara

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Meningioma is a benign tumor that occurs on CNS meninges, derived from arachnoid cap cells that form the outer layer of arachnoid membrane and the arachnoid villi. Olfactory groove meningiomas, have the incidence of 9-18% of all meningiomas and arise on frontosphenoid suture region, from crista galli to the

planumsphenoidale. The invasion of ethmoid bone and paranasal sinuses makes complete resection difficult. The objective of this article is to discuss the advantages of transbasal approach for anterior skull base tumors especially olfactory groove meningiomas in our institution. A 58-year-old woman presented with visual disturbance, headaches, and frontal lobe syndrome. Radioimaging showed 6.3 x 5.5 x 5.9 cm³ midline frontal hypodense lesion with perifocal edema, strong enhancement with contrast. One step tumor removal with transbasal approach and cranioplasty has been done. Patient recovered well post operatively. Transbasal approach is considered superior to any other approaches because providing more tumor exposure, less brain retraction, and early proximal vascular control.

Keywords: Olfactory groove, Meningioma

EP-0710 [Neuro-oncology » Extrinsic Tumors] Paraventricular Meningioma Revealed by Mental Disorder

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Ventricular meningioma constitutes 2% of intracranial meningioma, representing a challenging disease for neurosurgeons. Although cognitive impairment is one of the major symptoms of ventricular tumors, few studies have reported the details of cognitive impairment before and after their surgical removal. The expected effects on cognitive function should also be considered when choosing a surgical approach. We report the case of a large lateral ventricle meningioma revealed by cognitive dysfunction and moderate intellectual disability. The patient underwent subtotal resection of the tumor which had partial improvement in cognitive disorders. It is important to precisely assess neuropsychological function in patients with large brain tumors, and judicious preoperative plan, adequate knowledge of anatomy, and use of correct microsurgical techniques are fundamental in achieving complete resection of paraventricular meningioma with low morbidity. Pre and postoperative precise neuropsychological examinations may identify the potential cognitive impairment and beneficial effects of surgery in patients with large lateral ventricle meningiomas.

Keywords: Meningioma, Mental disorder, Ventricle

EP-0711 [Neuro-oncology » Extrinsic Tumors] Extra-Axial Medulloblastoma in Cerebello-Pontine Angle: A Case Report with Literature Review

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We report a rare case of an extra-axial medulloblastoma at the cerebello-pontine angle; This case concerns a 4-year-old child with an intracranial hypertension syndrome with alterations in the state of consciousness evolving for two months: the cerebral scanning finds a mass spontaneously hyper dense plaque against the posterior wall of the associated left rock Has a moderate dilatation of the ventricular system; Patient was operated in emergency of her brain tumor. The postoperative clinical evolution is satisfactory, the cerebral CT of control confirms the total excision of the tumor. The diagnosis of medulloblastoma is confirmed by histopathology.

Keywords: Medulloblastoma, Cerebello-pontine angle, Child

EP-0712 [Neuro-oncology » Extrinsic Tumors] Surgical Management of Central Nervous System Chordomas: A Serial of Nine Patients

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Background: Chordomas are midline tumors. They have a male preponderance. Sacrococcygeal region is the most common affected region. Chordomas and chondrosarcomas are rare, slow-growing but locally aggressive primary bone tumors arising from residual rests of notochord cells along the craniospinal axis. The current study presents the surgical management of patients with chordoma involving central nervous system.

Method: The patients operated between the years 2010 and 2015, for chordomas at neurosurgery department in BRSHH institution. After craniotomy/laminectomy performed using high speed drills under microscope to reach the lesion and in all cases tumors were removed totally just in one old patient subtotal removal had been performed. The mean follow-up period (survival rate) was 69±73.1(13-192) months. The mean age of the patients was 48.6±21.1(17-78) years.

Results: Nine (1:woman, 8:men) patients presented with three petroclival and six spinal chordomas. One patient was operated in 2001 then present with recurrence and metastasis in 2011 and twice in 2014. The most common complaint was back pain(100%) for spinal group, versus vision symptoms were seen in all petroclival group. The mean prodrome was less than 3months 2.3±1.4 (1-6)months. All spinal cases were treated with combined (anterior+posterior) approach to obtain GTR. All petroclival patients were treated using transsphenoidal approach (one using endoscope, and another was reoperated transcranially to remove residual piece), Morbidity rate was 22.2%. The recurrence rate was 22.2%.

Conclusion: Except for one old patient all of our patients were treated with GTR, however, 2 patients were experienced recurrence. En-bloc resection is essential to prevent metastasis.

Keywords: Chordoma, Primary bone tumor, Intradural petroclival, Stabilization, En-bloc GTR, Beam proton radiotherapy

EP-0713 [Neuro-oncology » Extrinsic Tumors] Spinal Cord and Mediastinal Compression due to Primary Vertebral Hydatid Cyst Disease: A Case Study

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Primary spinal hydatid cyst disease is rare. Especially in endemic countries spinal hydatid disease should be considered in the differential diagnosis of spinal cord compression syndrome and evaluated with imaging and serology. A 36 year-old woman from native of a rural area in the east of Turkey admitted to our hospital with a ten days history of lower extremity weakness. Neurological examination showed increased deep tendon reflexes and paraparesis with no sensory loss. Radiological findings showed a paravertebral inflammatory lesion at the Thoracal 1-2-3 level, invading the spinal canal with spinal cord compression and also mediastinum with compression to trachea and esophagus. We performed a surgical decompression using posterior approach also stabilization and then thoracal 1-2-3 corpectomy and stabilization using anterior approach. The soft paravertebral tissue and abscess removed with irrigation of the cystic fluid with hypertonic saline. The pathological diagnosis was hydatid cyst disease. Treatment was completed with long-term anti-parasitic antibiotherapy. Spinal cord compression is a frequent presentation of spinal hydatid cyst but neurological symptoms are non-specific and various. The treatment is removal with surgery, followed by an anti-parasitic antibiotherapy (albendazole) to prevent recurrences. However, a long-term follow-up is essential due to high rate of recurrences.

Keywords: Hydatid cyst, Spinal compression, Mediastinal compression, Paraparesis

EP-0714 [Neuro-oncology » Extrinsic Tumors]

Anaplastic Meningioma: A Case and Review of the Literature

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Anaplastic meningiomas (grade III) are rare tumors 1 to 3% of all meningiomas. Their management is not consensual because of their aggressiveness and / or their recurrences. Surgery is the first treatment implemented. Cerebral radiotherapy and, more rarely, chemotherapy can be therapeutic weapons but are still discussed. A 63-year-old woman who present a median frontal mass, intense headaches and a right hemicorp weakness. CT and MRI brain revealed an extra-axial tumor process suggestive of left frontal skeletal malignant meningioma with frontal osteolysis and extensive periosional edema. The patient was operated with favorable surgical procedures and a regression of the motor deficit. The findings of the pathologic study are in favor of anaplastic meningioma (WHO grade III). The patient was referred for adjuvant treatment by radiotherapy. The mean age of onset of malignant meningiomas is 59 years with a female predominance. The presence of the following characteristics in imagery indicates the malignancy of these meningiomas: heterogeneity, irregular tumor borders, rapid growth, invasion and infiltration of the cerebral parenchyma, bulky edema, bone lysis, absence of calcification, presence of numerous intra-tumor vessels. Survival differs according to the series: The survival rate at 5 years is 38% with a recurrence rate at 83% at 5 years. Anaplastic meningiomas have a high potential for recurrence and a poor prognosis despite multidisciplinary management

Keywords: Anaplasia, Meningioma, Radiotherapy

EP-0715 [Neuro-oncology » Extrinsic Tumors]

Giant Cavernous Hemangioma of the Calvaria: Case Report and Operative Nuances

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Descriptions of skull hemangiomas are increasing over time and worldwide. Although it is a rare and benign entity, case reports are common to find on databases. Cases of multiple or giant hemangiomas have been reported in the literature. Recently, Mohindra et al. reported 10 cases of giant hemangioma of skull in their literature review. Also known as, calvarial hemangioma, it's a primary intraosseous cavernous hemangioma lesion accounting 0,2% to 1,0% of all bone tumors and observed on frontal bone, temporal bone, parietal bone, occipital bone and orbit. Affects more men, than women in middle age with a ratio around 2, 5:1. The origin of these lesions is the external plate of calvarial bones. Gross total resection is the standard of care and recurrence is rare. In this article, the authors describe a giant primary intraosseous calvarial hemangioma of the frontal bone, review the literature and discuss operative nuances.

Keywords: Primary intraosseous cavernous hemangioma, Calvarial hemangioma, Giant calvarial hemangioma, Surgical treatment

EP-0716 [Neuro-oncology » Extrinsic Tumors]

Trigeminal Neurinomas: Microsurgical Management of 41 Cases

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Background: Trigeminal neurinomas are relatively rare tumors and represent 0.2% of all intracranial tumors. Trigeminal neurinomas usually arise from the schwann cells of the sensory root and can originate in any section of the fifth cranial nerve and correspondingly a variety of symptoms and signs may develop.

Method: From January 2009 to June 2016, recorded documents of operated intracranial trigeminal neurinomas were retrospectively studied for clinical profile, investigations, microneurosurgical management, complications, follow up and outcomes.

Results: Average follow up was 18.5 months. Total number of cases was 41, age range was 09 to 60 years, 22 cases were male and 19 cases were female. Clinically there is usually pain, paresthesia or numbness, often in more than one division of the nerve. MRI and CT scan were used for diagnosis and planning of surgery. Middle fossa extradural approach used in 18 cases, retrosigmoid retromastoid lateral suboccipital craniotomy used in 21 cases and combined approach used in 02 cases. Neurofibromatosis was associated in six cases. Trigeminal neurinoma associated with other cranial nerve neurinoma in 7 cases. Total removal in 29 cases, near total in five cases, subtotal in three cases. One patient with

trigeminal neurinoma who presented to us in unconscious state developed postoperative aspiration pneumonia and expired. Post operative important complications were ptosis, corneal ulcer and six nerve palsy.

Conclusion: Although very challenging, proper investigations and evaluation along with appropriate decision making and surgical planning with microsurgical techniques are the things that can result optimum outcome with complete resection.

Keywords: Trigeminal, Neurinomas, Microsurgical management

EP-0717 [Neuro-oncology » Extrinsic Tumors]

Occipital Transtentorial Approach for Pineal Region Tumors - How I Do it?

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The pineal region literally lies at the center of the brain deep inside cranial cavity. Various types of tumors may arise in this region mainly germinomas, tumors arising in the pineal gland itself and others like astrocytomas, ependymomas, dermoids, epidermoids and meningiomas etc. Although pineal region tumors comprise about 1% adult brain tumors, they make up 4-8% in children. Approaching surgically to these tumors is a formidable task as they are situated deep inside the cranial cavity. Two commonly practiced surgical approaches are occipital transtentorial and infratentorial supra cerebellar approaches. In the following paper, I will discuss personal experience of occipital transtentorial approach to the pineal region tumors. Occipital transtentorial approach is a safe, good & time tested method of surgery of the pineal region tumors.

Keywords: Pineal region, Occipital trans-tentorial, Pinealoblastoma, Epidermoid

EP-0718 [Neuro-oncology » Extrinsic Tumors]

Giant Metastatic Calvarial Ewing Sarcoma: A Case Report

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Ewing sarcoma is the second most common primary bone tumor seen in children and adolescents. It is categorized in small round cell tumors and is highly malignant tumor. The typical histological signs of EWS are round cells with a solid strata, protruding nuclei, no rosette formation, mitosis and presence of bone structures. 95% of the cases involve t(11;22) (q24;q12) translocation of chromosome 22. Metastases to the CNS develop in 10-37% of cases. In most calvarial metastases, the tumor tends to grow intracranially. Extracranial extension is reported in only 8 cases. Prognosis of calvarial Ewing sarcoma is better than those seen in other areas of the body. With a combination treatment of total excision, radiotherapy and chemotherapy, the survival in 5-year follow up ranges from 39% to 65%. The case that we are presenting is a 23 year old male patient previously diagnosed with Ewing sarcoma and had a huge temporoparietal bone metastasis. The patient's tumor could be observed posterior to auricula as an approximately 10*10

cm bulge. He had hearing loss in his left ear, other neurological examinations were normal. In MRI, the mass had both extracranial and intracranial extensions with both extradural and intradural components with effusion in left mastoid cells and indentation into left cerebellar hemisphere, left occipital and parietal lobes. We resected the tumor and afterwards the patient underwent radiation therapy. The patient is currently alive with no recurrence.

Keywords: Ewing sarcoma, Calvarial tumor, Skull tumor, Bone tumor, Ewing, Metastasis

EP-0719 [Neuro-oncology » Extrinsic Tumors]

Parafalxian CNS Lymphoma Mimicking Parafalxian Meningioma

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Primary and secondary lenfomas of the Central Nervous System (CNS) usually shows high mortalities. Primary CNS lymphomas are seen 0.5 in 100.000 humans per year and %4.5 reason of intracranial neoplasies. Secondary CNS involvement is seen %30-50 in Burkitt lymphoma and acute lymphocitic leukemia, while %2-10 at diffuse big B-cell lymphoma and %4-24 at mantle cell lymphoma. Systemic relapse and progressions and rarely remissions can be seen. Secondary involvement of CNS in diffuse big B-cell lymphoma is the most uncommon. 70 year-old male patient had the complaint of weakness of his left part of the body within last 15 days. There were no neurological deficit except the motor weakness of left upper and lower extremity with 4/5 muscle power. Brain CT scan showed right frontal lesion adjacent to midline in subfalxian location. Isodens lesion was highly and diffuse contrasted and there were shift and edema in images. Brain MRI showed homogen contrasted areas in subfalxian location. The mass was thought as atypical menengioma, but the edema and shift made it to surgery. Postoperative pathological findings showed diffuse big B-cell lymphoma. There were cervical lymphadenomegalies in postoperative PET-CT scan. Oncological treatment had been planned. Primary and secondary lymphomas of CNS cause serious morbidity and mortality. Early diagnosis and treatment of these lesions are important. Radiological findings mimicing parafalxian menengioma may be misleading. Lesions caused by lymphomas may also mimic bilateral acute epidural hemorrhage and cranial masses intracranially, and juvenile arthritis, lung abscess and gastrointestinal adenocarcinomas extracranially.

Keywords: Central nervous system lymphoma, Lymphoma mimicing menengioma, Parafalxian lymphoma

EP-0720 [Neuro-oncology » Extrinsic Tumors]

The Histopathological Comparison of Small- and Big-Sized Meningiomas: A Single Center Study

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Background: Meningiomas are benign tumors that arises from meningotheial cells of nervous system. Small sized meningioma terminology is usually used for small tumors with a diameter of <3cm. In this study we compared the histopathological features of meningiomas by their size.

Method: 91 cases of meningioma who were operated in our clinic between 2012 and 2105 were retrospectively reviewed. The median age was 54,5 years in small-sized group (Group 1, n=26) whereas 58 in big-sized (Group 2, n=65) meningiomas.

Results: 17 patients were diagnosed with Grade 1 and 9 with Grade 2 meningiomas in Group 1. In Group 2, 52 grade 1, 11 Grade 2 and 2 Grade 3 meningiomas were detected. On histopathological study 5 different parameters such as small cell component, macronuclei presence, Ki-67 index, progesterone receptor status and mitosis were assessed. The median Ki-67 index was 7% in Group 1 and 8% in Group 2. All these histopathological parameters show any significant difference between both groups (P=0.59, P=0.27, P=0.1, P=0.29 and P=0.62, respectively). However, small-size meningiomas were most frequent in female gender than male gender (P=0.47, OR:0.36, RR:0.78).

Conclusion: Small-sized meningiomas and big-sized meningiomas have similiar histopathological features. However, small-size meningiomas appear to occur in females.

Keywords: Histopathological parameters, Big-sized meningiomas, Small-sized meningioma

EP-0721 [Neuro-oncology » Extrinsic Tumors]

A Rare Case of Bilateral Cavernous Hemangioma of the Orbit

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Cavernous hemangioma of the orbit (CHO) is a benign slow growing lesion of intra-conal space. Bilateral orbital cavernous hemangiomas is extremely rare, so that only 11 cases have been reported in scientific literature. A 54 year-old patient presented a one-year history of impaired visual acuity of the left eye. Physical examination showed a left axial proptosis with no restriction in eyes motility and a normal intra-ocular pressure. Orbital magnetic resonance imaging showed a 28 mm diameter intra-conal space mass of the left orbit, as well as another 11 mm diameter lesion in the right eye, in the supero-medial extra-conal space. A superior wall left orbitotomy was performed with a total removal of the tumor. The right lesion was respected. Histopathological examination confirmed the diagnosis of CHO. Cavernous hemangiomas are the most common intra orbital vascular lesions in adults. Their physiopathology is subject of controversy. CHOs are usually solitary and oftenly occur in the lateral part of the retrobulbar intra-conal space. Bilateral lesions are so are that only 11 patients had been reported with a bilateral CHO. The diagnosis is highly suggested in CT and MRI images. The lesions are usually managed conservatively, and surgical excision is reserved for those that cause severe proptosis or optic nerve compression. Bilateral cavernous hemangiomas are extremely rare. Orbital imaging guides the diagnosis. The neurosurgeons prefer craniotomy while ophthalmologists favor various modifications of orbitotomies.

Keywords: Orbit tumors, Bilateral lesions, Case report

EP-0722 [Neuro-oncology » Extrinsic Tumors]

Long-Term Surgical Treatment Outcomes of Hemangiopericytomas

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Background: Hemangiopericytomas are extraaxial malignant tumors which are affecting both cranial and spinal cord. Heaman-giopericytomas are misdiagnosis as meningiomas radiologically. This study presents six consecutive hemangiopericytomas.

Method: The patients operated between the years 2006 and 2015, for hemangiopericytomas at neurosurgery department in BRSHH institution. After craniotomy/laminectomy performed using high speed drills under microscope to reach the lesion. Three tumors were removed totally, 2tumors were removed near-totally and one subtotaly. The last three patients were received adjunctive RTP.

Results: Six (3woman, 3men) patients were operated for hemangiopericytoma. The mean age was 44.3±12(26-65). The most common complaint was headache (70%). The clinic course was <2months. The locations were petroclivus, parasagittal (frontoparietal), frontal, cerebellum, CPA and sacrum. Improvement rate was 80%. The factors affecting hemangiopericytomas' are worsening neurological functions on presentation and early complications related to surgery. Extent of resection, previous recurrences and infratentorial location were the factors affecting recurrence of hemangiopericytomas. The mean follow-up period was 101.2±41.8(20-134) months. Morbidity rate was 33.3%. One was complain of hydrocephalus and treated with VP-shunt. Sacral tumor was excised on two stages. This patient had extraneural abdominal metastasis on her PO30.month. Recurrence rate was 33.3% (one female and one male, everyone was operated twice for recurrent tumors).

Conclusion: Hemangiopericytomas are most located infratentorially and recurrent lesions especially after subtotal resection. Adjuvant RTP was used in three cases. In our cases, recurrence occurred after long period of treatment of STR+RTP (4years on average). We recommend adjuvant RTP after NTR/STR to minimize recurrence risk and close follow-up.

Keywords: Intracranial hemangiopericytoma, Spinal hemangiopericytoma, Gross-total resection, Recurrence, Extraneural metastasis

EP-0723 [Neuro-oncology » Extrinsic Tumors]

Atypical and Malignant Meningiomas: Presentation of Our Experience and Literature Review

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Background: Atypical and malignant meningiomas represent approximately 20% of all intracranial meningiomas with a very unpredictable natural course. Their high risk of recurrence makes their management a real challenge both on the indication of a complementary treatment and the modalities of follow-up.

Method: We made a retrospective study of 5 cases of atypical or malignant meningiomas treated in the department of neurosurgery of Fattouma Bourguiba University Hospital during the last 7 years. The final histological diagnosis was confirmed each time by an experienced pathologist in neuro-oncology.

Results: Three Males and two females (Sex-Ratio: 1, 5) with a mean age at presentation of 53 years were included. In four cases, it was a grade II meningioma and in one case the patient has a grade III meningioma. Tumor resection was complete in 4 patients. Adjuvant radiation therapy was administered to all patients and none had chemotherapy. Four patients had recurrence within a median disease free survival of 27 months and all of them were reoperated. The five-year survival rate was 80%.

Conclusion: Although our study population is small, it appears that atypical and malignant subgroups of meningiomas carry a high risk of recurrence compared to their grade one counterparts. Phenotypic heterogeneity among these tumors makes any objective evaluation of the long-term prognosis totally random and larger studies including a bigger number of cases on a longer period of time is mandatory.

Keywords: Meningioma, Atypical, Malignant, Surgery, Prognosis

EP-0724 [Neuro-oncology » Extrinsic Tumors]

Isolated Dural-Calvarial Metastasis Associated with Cholangiocarcinoma; Case Report

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Intracranial metastases are most common in the brain parenchyma, but may also be leptomeningeal and dural regions. Dural metastases may occur with focal findings such as focal seizures, aphasia, visual field defects, hemiparesis, as well as systemic findings such as headache, confusion, memory loss, lethargy and vomiting. We report a case of calvarial and dural metastasis due to cholangiocarcinoma in the left parietooccipital region. A 75-year-old female patient admitted to our outpatient clinic with severe headache starting 6 months ago and swelling for 1 month. Physical examination revealed a palpable painless mass of about 4x3 cm in the left parietooccipital region. Her neurological examination was normal. Brain MRI showed T1A isointense, T2A moderate hyperintense mass in Left parieto occipital region which contains cystic components and destruction of the neighboring bones. The mass was totally excised with invasive dura and calvarial bone. Duraplasty was done. Pathological evaluation was reported as a cholangiocarcinoma metastasis. The patient was transferred to oncology. Isolated calvarial and dural metastases are rare. The most common cancers which causing dural metastases are breast, prostate and lung cancer. Cholangiocarcinoma in our case is malignant cancer originating from epithelial cells of intrahepatic and extrahepatic bile ducts. It is a rare tumor and its progress is poor. Brain, scalp and calvarium metastases are very rare in the literature. Approaches to dural metastases vary according to

the type of primary cancer. The treatment method has not been standardized. However, treatment methods include radiotherapy, chemotherapy, combination of radiotherapy and chemotherapy or only supportive therapy.

Keywords: Cholangiocarcinoma, Dura, Metastasis

EP-0725 [Neuro-oncology » Extrinsic Tumors]

A Rare Case: Cerebellopontine Angle Medulloblastoma in a Pregnant Woman

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Medulloblastoma (WHO grade IV) is the most common intracranial tumor and develops primarily in children with a peak incidence at 7 years. Second peak in incidence can be seen in adulthood at 21 to 40 year old age group. Medulloblastomas in childhood mostly arise in midline and in adults cerebellar hemispheres involvement is more frequent. Medulloblastoma is an embryonic neoplasm which is defined by poorly differentiated or undifferentiated neuroepithelial cells. CPA medulloblastomas are extremely rare tumor and only 39 cases reported in the literature. A 34 years old pregnant woman presented with progressive vomiting, desorientation to Gynecology&Obstetric Clinic. After right CPA lesion, with approximately 37x46 mm diameter, seen in non-contrast enhanced MRI, patient has been consulted to Department of Neurosurgery. In neurological examination GCS: 7, impaired consciousness and respiration was observed. She has been intubated in ICU and then transferred to operation room. After general anaesthesia external ventricular drainage system was inserted to the left frontal ventricle; and then with right suboccipital retrosigmoid craniotomy, gross-total tumor removal was performed. Postoperatively first day patient was extubated, GCS:15. Postoperatively non-contrast MRI was taken and after 14 days later first operation second look was performed for residual tumor. Pregnancy was the limitation for preoperative and postoperative scannings, operation time. Pathological diagnosis was medulloblastoma, classical type. In CSF samples there was no tumor cells. She is still in follow-up, there is no problem related with her and her baby. Medulloblastoma should be considered as a differential diagnosis of a lesion in the CPA.

Keywords: Cerebellopontine, Angle, Medulloblastoma, Tumor, Pregnant

EP-0726 [Neuro-oncology » Extrinsic Tumors]

Primary Ewing's Sarcoma of the Posterior Fossa

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Intracranial tumors are the most commonly seen solid neoplastic lesions in children. Their incidence is 2-4/100.000 per year. Up to

70% are located in the posterior fossa. The most common histological types are astrocytoma, medulloblastoma, and ependymoma. Plexus papilloma, schwannoma, hemangiopericytoma, atypical rhabdoid tumors, brainstem glioma, and meningioma are rare. Ewing sarcomas represent the second common malignant bone tumors in childhood and adolescence and are most commonly found in the pelvis, femora, and ribs but may affect any bone and are extremely rare in the posterior fossa. Here, we report an adolescent presenting with a tumor of the Ewing sarcoma tumor family (ESTF) presenting with clinical findings of intracranial pressure. A 9-year-old girl was admitted with a several-weeks history of headache, vomiting, and abdominal pain. Neurological examination revealed slight ataxia but was otherwise normal. Magnetic resonance imaging (MRI) of the brain revealed a large space-occupying lesion of the right posterior fossa measuring 50 × 50 × 57mm. The lesion was based on the convexity of the right infratentorial space and extension into the posterior fossa with bone erosion extending towards the right occipital space. The patient underwent total tumor resection via a right-sided suboccipital approach. Histologically, the tumor consisted of small to ovoid cells with scanty cytoplasm, Ewing or PNET. Ewing sarcoma belongs to the group of highly malignant small blue and round cell neoplasms. They most commonly occur in children and young adults. The tumor is predominantly located in pelvis, large hollow bones, and ribs. Primary intracranial location is extremely rare.

Keywords: Ewing sarcoma, Posterior fossa, Primary

EP-0727 [Neuro-oncology » Extrinsic Tumors]

Metastasis of an Adenoid Cystic Carcinoma in the Falx: A Case Report and Literature Review

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A 67yo patient who underwent surgery in 2009 for an adenoid cystic carcinoma of the left parotid followed by radiations with good control. She presented in May 2016 with headache, and numbness of the 4 limbs. The neurological examination found a tetraparesis, with a left facial residual paresis. The CT scan and the MRI showed a mass of the falx and a second mass on the left maxillary, enhancing strongly after contrast injection. She underwent surgery for the falx mass with a subtotal resection. The anatomopathological examination revealed a metastasis of an adenoid cystic carcinoma. She underwent a second surgery for the maxillary metastasis with good outcome and was referred to the oncologist; she is actually receiving radiations. Adenoid cystic carcinoma are malignant epithelial tumors of the maxillo-facial region. Usually developed from the salivary gland, lacrimal gland or the upper respiratory tract. With a female dominance, and a high rate in the fifth decade, we distinguish 3 histological types: glandular, tubular and solid. Surgery represent the reference treatment for adenoid cyst carcinoma and it can be followed by radiations if necessary. Through the literature many metastasis have been described: breast, lung, skin or genital tract. The intracranial localisation have been reported to the cavernous sinus of the sellae. We report the first case, to the best of our knowledge of a falx metastasis.

Keywords: Metastasis, Adenoid cystic carcinoma, Falx

EP-0728 [Neuro-oncology » Extrinsic Tumors]

Plasmacytoma of the Skull: Report of Four Uncommon Cases

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Background: Plasmacytomas of the skull are rare and few cases have been reported. It has a wide spectrum of pathology, including a quite benign solitary plasmacytoma, and a malignant, multiple myeloma.

Method: Four cases of skull plasmacytoma affecting two men and two women are reported.

Results: The patients had a mean age of 68 years. The plasmacytoma was solitary in two cases and associated to multiple myeloma in the two others. Clinical presentation was a huge frontal mass in an 83 year-old woman and progressive right hearing loss in a 42-year-old man for solitary plasmacytoma. Right exophthalmia due to an intra-orbital plasmacytoma revealing a multiple myeloma in an 86-year-old woman and a temporal purely epidural plasmacytoma mimicking a neurosurgical emergency, in a 60 year-old man already known for having multiple myeloma being victim of a head injury. Of the four patients, three were operated and all underwent radiation therapy with good early outcome especially in case of solitary plasmacytoma.

Conclusion: Skull plasmacytomas are rare entities with complex clinical and radiological features. They can be easily misidentified and must be considered in the differential of solitary skull masses. The prognosis for solitary plasmacytoma of the skull appears to be good in contrast of being associated to multiple myeloma.

Keywords: Myeloma, Plasmacytoma, Skull, Uncommon

EP-0729 [Neuro-oncology » Extrinsic Tumors]

Intracranial Atypical Meningiomas: A Case Series

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Background: Atypical meningiomas fall into a category World Health Organization Grade II, which have higher local recurrence rates and lower survival rates than their benign counterparts. The aim of this study is to review the outcome of newly diagnosed patients with atypical meningioma after therapy.

Method: We conducted a retrospective review of the medical records of patients having atypical meningiomas who were treated in our hospital between January 2005 and December 2014.

Results: There were 27 consecutive patients having fresh intracranial atypical meningiomas treated in our hospital between January 2005 and December 2014. Their mean age at diagnosis was 60.81 years. 23 patients (85.19%) underwent total resection of the tumor, whereas 4 patients (14.81%) had partial resection of their tumors during their first time of surgery. 15 patients (55.56%) had finished adjuvant radiotherapy. 9 patients (33.33%) had tumor progression or recurrence during follow-up, and 4 of them were proved to

have malignant transformation to anaplastic meningiomas in the following operations. 19 patients (70.37%) had a favorable outcome, 7 patients (25.93%) had an unfavorable outcome, and 1 patient (3.7%) died due to disease progression. Those treated by having total surgical resection of their tumors followed by immediate postoperative adjuvant radiotherapy showed no tumor recurrence during follow-up.

Conclusion: Surgery remains the standard treatment to atypical meningioma, and postoperative adjuvant radiotherapy is still controversial especially to those who undergo total surgical resection of the tumors. Our study reveals that early postoperative adjuvant radiotherapy seems to play a role in local control.

Keywords: Atypical meningioma, Anaplastic meningioma, Local control, Malignant transformation, Post-operative adjuvant radiotherapy

EP-0730 [Neuro-oncology » Extrinsic Tumors]

Phosphohistone-H3 Immunohistochemistry for a WHO Grade I Sclerosing Meningioma

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Meningiomas are primary brain tumors with a benign and slow-growing character. Among the various types of intracranial meningiomas, sclerosing meningiomas have been reported to be very rare. In this report, we presented a patient who was diagnosed with a sclerosing meningioma WHO Grade 1. We performed immunohistochemical stainings including EMA, Vimentin, PR, GFAP, P53, EGFR and Phosphohistone-H3. Our results showed positive immunoreactivity for EMA, EGFR and vimentin and negative for GFAP, p53 and PR. Ki-67 proliferative index was 2-3%, and sparse mitotically active cells were detected by PHH-3. It can be concluded that PHH3-immunohistochemistry can be used to detect mitotic activity in sclerosing meningioma.

Keywords: Mitotic index, Phosphohistone-H3, Sclerosing meningioma

EP-0731 [Neuro-oncology » Extrinsic Tumors]

Primary Melanotic Progonoma of Skull

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Melanotic progonoma is a rare tumor that generally arises in the maxilla during the first year of life. The involvement of cranial vault bones in children is extremely rare. The authors report two cases of melanotic progonoma diagnosed in two kids aged of 7 and 11 months respectively. One of the patient was a boy and the other was a girl. Both patients were admitted for a congenital right parieto-occipital bone tumor, increasing progressively in size. The radiological examination showed a spicular opacity pattern in the two cases. CT scan and MRI have demonstrated heterogeneous

bony tumoural processes with an exo- and endocranial evolvment associated with a meningeal reaction. The surgical resection of the lesion was complete. We highlight the rarity of this neoplasm and discuss epidemiological, clinical, radiological and therapeutical characteristics of this pathology.

Keywords: Infant, Melanotic progonoma, Skull, Surgery

EP-0732 [Neuro-oncology » Extrinsic Tumors]

Giant Cell Tumor of the Skull

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Giant cell tumor of bone is 3 -7 % of primary bone neoplasm that occurs chiefly in the ends of the long bones (90%). GCT rarely involves the skull, comprising less than 1 % of giant cell tumors of bone. When the skull is involved, the sphenoid and temporal bones are preferred sites. Calvarial giant cell tumors are indeed exceptional. A 24-year-old female, had a complaint of swelling on the middle of the frontal bone and persistent frontal headache. Physical examination revealed evidence of local swelling with rubber consistency 6 cm in diameter overlying middle of the frontal bone and no other physical sign. Neurological examination was normal. Radiological investigations (skull X-ray, computerized tomography and Magnetic resonance imaging) showed an expansile mass in the frontal bone expanding inner and outer tables on the middle peripherally sclerotic, centrally radioluscent. At surgery, the tumor was completely removed to the borders of normal bone tissue. Histopathologic examination reported a giant cell tumor of the bone Postoperative course was uneventful. In expansile lytic lesions of skull, giant cell tumor should be considered in the differential diagnosis. Surgical treatment is the treatment of choice for giant cell tumors of the skull. If the tumor is not possible to remove totally, it should be combined with radiotherapy.

Keywords: Giant cell, Skull, Tumor

EP-0733 [Neuro-oncology » Extrinsic Tumors]

Primary Meningeal Melanocytoma in the Left Temporal Lobe Associated with Nevus Ota: A Case Report and Review of the Literature

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A 19-year-old man presented with a headache and seizure at our department. Neurological examinations were otherwise normal. On physical examination he had asymptomatic, bluish, speckled, and well-demarcated hyperpigmented macules on the left midface extraorally. A left temporal space-occupying lesion was seen on magnetic resonance imaging. The mass was hyperintense on T1-weighted images and isointense on T2-weighted images. Enhancement was shown on contrast-enhanced magnetic resonance imaging (MRI). The preoperative diagnosis was meningioma. Gross complete resection was performed. Pathological studies

led to the diagnosis of meningeal melanocytoma World Health Organization (WHO) grade I. The patient received oncologic consultation. Because total resection of the tumor was achieved and its histopathologic grade was benign (WHO grade I), radiotherapy was not advised for the patient and he followed up every 6 months. No tumor was seen on follow-up MRI one year after surgery. Presentation of meningeal melanocytoma in the supratentorial compartment is rare, and its combination with nevus Ota has been reported in very few cases. Although this lesion is benign, it might behave aggressively. Complete surgical resection of the lesion is the preferred therapeutic option.

Keywords: Meningeal melanocytoma, Neoplasm, Ota nevus

EP-0734 [Neuro-oncology » Extrinsic Tumors]

Postoperative Tension Pneumoventricle in Posterior Fossa Tumor with CSF Diversion Procedure: Case Report

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Occurrence of tension pneumoventricle (symptomatic intraventricular air) can result in rapid clinical deterioration in an otherwise stable patient. It is a rare clinical entity, mentioned in relation to cerebrospinal fluid (CSF) diversion procedures, during the postoperative period. We present a patient with posterior fossa tumor who underwent excision by left paramedian suboccipital craniectomy in prone position. In the first 2 days of postoperative care, patient was fully conscious, alert, and oriented to time place and person with minimal headache owing to site of operation with high flow of csf through redivac subfacial drain. Neurological status of the patient deteriorated after opening of ventriculostomy tube into saline bag through an infusion set. The condition improved after evacuation of air under water-seal with closure of redivac subfacial drain.

Keywords: Tension pneumoventricle, Posterior fossa tumor (CSF) diversion, Suboccipital craniectomy

EP-0735 [Neuro-oncology » Skull Base]

Surgical Treatment of the Primary Sinonasal Malignancies with Dural and Brain Involvement

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Experience in treatment of 142 patients with primary sinonasal malignancies with dural and brain involvement in a single institution was performed. Major types of histological diagnoses were: adenocystic cancer, adenocarcinoma, low differentiated carcinoma, sinonasal undifferentiated carcinoma, nasopharyngeal cancer. Tumor initial sites were nasal cavity, paranasal sinuses and nasopharynx. These tumors usually destruct anterior skull base and

invade dura and brain tissue. TNM distribution of the tumors was following: T4a (63%) and T4b (37%). Indications for surgery were developed: the removal of intradural tumor mass, cytoreduction, histological verification in the absence of pre-biopsy the tumor. We performed craniofacial resection in 27%, subtotal removal in 25% and biopsy in 48%. The main problems in the surgery planning were highlighted: resection margins, large skull base defect reconstruction, general poor condition of the patient because of the chemotherapy, metastases, respiratory disorders and cachexia. Preoperative algorithm was described: autologous blood harvesting (serum and red blood cells), correction of water-electrolyte and protein metabolic disorders. Complications of craniofacial resection and subtotal removal were pointed: nasal CSF leak (16%), infectious and inflammatory complications (8%), oculomotor and visual impairment (5%), autograft necrosis (4%), and anemia (17%). The mortality rate was 2%. Indications and contraindications for resection of the tumor were developed. Optimal ways of skull base reconstruction after tumor removal were described. Follow-up period was 4 years.

Keywords: Sinonasal malignancies, Skull base, Cancer, Surgery

EP-0736 [Neuro-oncology » Skull Base]

Neurosurgical Pearls in Management of Large Vestibular Schwannomas

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Microsurgical resection of large Vestibular Schwannomas is a definitive prime treatment option; unlike their smaller ones. Progress in modern imaging and innovation in surgical equipment are credited for proper diagnosis and better surgical outcome. The author reviews representative cases from large patient's materials at KFSH & Research Center with focus on recommended surgical strategies, value of intraoperative neurophysiology monitoring including MEP and SSEP in maintaining the integrity of brain stem and cranial nerves, and surgical outcome in management of giant tumors. The presentation will be complemented with description of the surgical position adopted, author's technical recommendations in facilitating a safe resection as well as, highlights on selection criteria for treatment with stereotactic radiotherapy.

Keywords: Retrosigmoid, Vestibular schwannomas, Facial nerve, IOM

EP-0737 [Neuro-oncology » Skull Base]

The 5D's Concept in Safe Resection of Central Skull Base Meningiomas

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Radical microsurgical resection of meningiomas remains the primary treatment option in our contemporary practice. The complex neurovascular structures at the central skull base and perisellar region may pose a major surgical challenge at the time of tumor resection. The evolution of modern neuro-imaging, promotion of tailored surgical approaches and innovative neurosurgical techniques enhance surgical planning, navigation and lead to safe resection of

complex skull-base tumors with improved patient's outcome. The selection of optimal surgical approach should be patient and lesion specific. It should offer a shorter and multiple avenues to the target, improves visualization of vital structures, early control of vascular supply to the lesion and facilitates microsurgical dissection. The selected approach should also minimize the risk of infection, negates the need for excessive brain retraction or unnecessary complex skull reconstruction and maintains good cosmetic results. The welding of proper surgical approach with excellent microsurgical technique is of paramount value for excellent surgical outcome. The author will review important recommendation for step by step surgical removal of these meningiomas with focus on other important surgical considerations and his 5D's concept. Representative cases from a large series of patient material will be selected to demonstrate the value of these recommendations.

Keywords: Skull base, Microsurgery, Meningiomas, Vision, Approaches

EP-0738 [Neuro-oncology » Skull Base]

Neurenteric Cyst of the Ventral Craniocervical Junction: A Case Report

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Neurenteric cysts are congenital lesions that are lined by endodermal cell-derived epithelium. They are most frequently seen in the intradural extramedullary space in the lower cervical and upper thoracic spine. We describe a rare case of neurenteric cyst arising from the ventral cervicomedullary junction that was totally resected via a posterior approach. A 24-year-old woman presented with a four week history of neck pain and progressive left hemiparesis. Admission MR imaging demonstrated an intradural extramedullary cystic mass lesion ventral to the upper spinal cord from medulla to C2. We performed a posterior approach with a minimal suboccipital craniectomy and left hemilaminectomy C1-C2. The lesion was totally removed after emptying the cyst and with gentle traction of the capsule. Surgical resection resulted in resolution of the neurological deficit. Histological examination revealed a cyst wall lined by endodermal epithelial cuboid cells with isolated goblet cells. Overall features were consistent with neurenteric cyst. Postoperative course was uneventful. At sixth month of follow-up the patient is asymptomatic and MRI shows no residual lesion. Neurenteric cyst is a rare lesion of the craniospinal junction, and should be considered among differential diagnoses. Complete excision is the treatment of choice. Different approaches have been described to resect the lesions of this area. Unlike solid lesions, the cysts can be easily aspirated and decompressed before resecting the capsule. That is why the posterior approach seems to be a good option to reach the cyst minimizing risks of neurological injury.

Keywords: Neurenteric cyst, Cervicomedullary junction, Posterior approach

EP-0739 [Neuro-oncology » Skull Base]

Foramen Magnum Tumors Management: One Single Center Experience

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Our study is a retrospective analysis of the clinical data, surgical outcomes, histological finding and prognosis of foramen magnum tumors through a serie of 10 cases operated at the department of neurosurgery at Mohamed VI medical University hospital, Marrakesh, from January 2002 to December 2016. There were 6 male and 4 female patients (mean age, 42.6 years). Cervico-occipital pain (80%) and motor deficit (100%) were the most common presenting symptoms. MRI was the most appropriate diagnostic tools in visualizing tumors of this region. All operations were performed by the posterior approach and Gross total resection was achieved in 9 cases. Surgical mortality was 20%. 4 other patients had complications like CSF leak (30%), meningitis (10%), and transient worsening of neurological deficits (10%) but made neurological recovery later. Histopathological examination revealed 6 meningiomas, 3 neurinomas and one neurenteric cyst. Foramen magnum tumors have long been regarded as difficult lesions both in terms of diagnosis and management. However, with the availability of MR imaging, newer surgical techniques and skull basal exposures, the excision of these lesions is becoming easier and safer.

Keywords: Foramen magnum, Meningioma, Neurinoma, MRI, Surgery

EP-0740 [Neuro-oncology » Skull Base]

Best Treatment Option for a Small Vestibular Schwannoma - The Evidence

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The optimal management of a small cerebellopontine angle vestibular schwannoma less than 2.5 cms evokes considerable debate and controversy. There are vehement and often emotional arguments for microsurgery, radiosurgery and even observation. The aim of treatment is to control the tumour and preserve function. This presentation would impartially review the scientific evidence available in the published literature and give a holistic picture to the viewer. Understanding the natural history of these small tumours is critical if one wants to observe these tumours. One must be aware at what rate they grow, what happens to their hearing and the ability to follow them up. For radiosurgery one should study large series with a long followup and only those series in which the currently acceptable dose of 12 to 13 gray to the tumour margin has been given. One has to check the tumour control rates as well as the development of new cranial nerve dysfunction. Also important is to study the preservation rates of serviceable hearing and the quality of life. A detailed evaluation of the evidence for malignant transformation after radiosurgery would also be presented. The current status of microsurgery in experienced hands would be

studied with regards their outcomes and complications. Finally an analysis of comparative studies of observation vs radiosurgery vs microsurgery would be presented with their level of evidence. The aim would be to present the available scientific evidence for the management of the small vestibular schwannoma and enable the viewer to take a considered rational decision.

Keywords: Small vestibular schwannoma, Observation, Radiosurgery, Microsurgery, Malignant transformation

EP-0741 [Neuro-oncology » Skull Base]

Growing Vestibular Schwannomas. Preferable Treatment

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Background: Is there a difference between primary total removal of vestibular schwannoma (VS) and totally removed tumors after previous subtotal/partial resection and stereoradiosurgery (SRS)?

Method: We compared 2 groups treated: primary radical removal (407) and radical removal following partial surgery and/or gamma knife SRS failure (11).

Results: 90% of treated VS were Gr.III and IV. Retrosigmoid-transmeatal approach was used for removal. In group of primary microsurgery 99% were removed radically. Only 3 recurrences present. Primary microsurgery achieved anatomical preservation of CN VII in 96% with House-Brackmann I-III function in 87%. Useful hearing spared in 12%. Majority of patients returned to previous activity. Surgery after partial resection and SRS failure was difficult in achieving radical removal. Satisfactory function of CN VII was achieved in 9% only without chance of hearing preservation. Viable and proliferating tumor cells were proven histologically in all tumors after SRS.

Conclusion: Growing VS is to be treated by primary radical microsurgery. SRS did not prove to be effective alternative to microsurgery in patients in whom the initial microsurgical removal failed.

Keywords: Vestibular schwannoma, Acoustic neuroma, Stereoradiosurgery, Microneurosurgery

EP-0742 [Neuro-oncology » Skull Base]

A Case of Intraseptal Meningioma Presenting with Signs of Pituitary Adenoma

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Meningiomas constitute approximately 20 % of all intracranial neoplasms. To our knowledge only one case of intraseptal meningioma from the sellar floor has been reported in the English literature. A thirty three years female patient with a three years history of progressive global headache associated with left sided monocular blindness. On examination a left sided monocular blindness plus galactorrhea and irregular menses noticed. An MRI

scan: Intraseptal mass with extension into the suprasellar region with compression of both left cavernous sinus and left optic nerve. Suprasellar meningioma (tuberculum sellae, clinoid processes, diaphragm sellae) may grow downward into the sella turcica. The intraseptal tumors are thought to arise within the sella turcica and extend superiorly into the chiasmatic cistern, causing visual and endocrine dysfunction by compressing optic pathways and pituitary stalk. These tumours frequently invade the sella turcica (occasionally may be mistaken for a pituitary tumour), diaphragm sellae, optic canals, and medial aspect of the cavernous sinus. Endoscopic transsphenoidally approached, but abandoned because the mass was very vascular. Histology confirmed a Meningioma with good response to radiotherapy. Not always possible to remove the tumour completely due to awkward location and as a result patients often have to undergo radiation treatment as well as drug therapy as what happened to our patient.

Keywords: Sella turcica, Meningioma

EP-0743 [Neuro-oncology » Skull Base]

Pediatric Chordoma: The Quest for Cure

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Background: Skull-base chordomas in patients under 20 years of age are extremely rare. Their course, management, and outcome have not been defined. We highlight the distinguishing clinical and radiological characteristics in a series of pediatric patients with skull-base chordomas, and analyze the outcome of a cohort who underwent uniform treatment. We emphasize the predictors of overall and progression-free survival, which aligns with Collins' law for embryonal tumors.

Method: Thirty-one patients with a mean age of 10.7 years (range 0.8-22) harboring skull-base chordomas were evaluated. We retrospectively analyzed the outcomes and prognostic factors for 18 patients treated by the senior author (OA), with uniform management of surgery with the aim at gross-total resection followed by proton-beam radiotherapy. Mean follow-up was 119.2 months (range 8-263).

Results: Abducens nerve palsy was the most prevailing symptom at presentation. Imaging disclosed large tumors that often involve multiple anatomical compartments. Patients undergoing gross-total resection had significantly increased progression-free survival ($p=0.02$) and overall survival ($p=0.05$) compared with those having subtotal resection. Those who lived through the period of risk for recurrence without disease progression had a higher probability of living entirely free of progression ($p=0.03$; odds ratio=16.0) until last follow-up. Age, sex, and variant did not yield statistical significance in survival.

Conclusion: Long-term overall and progression-free survival in children harboring skull-base chordomas can be achieved with

gross surgical resection and adjuvant proton-beam radiotherapy, despite an advanced stage at presentation. Collins' law does apply to pediatric skull-base chordomas, and children with this disease have a hope for cure.

Keywords: Brain tumor, Children, Chordoma, Collins' law, Pediatric oncology, Skull base

EP-0744 [Neuro-oncology » Skull Base]

Complications of Posterior Cranial Fossa Surgery: About 39 Cases

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The surgery of the posterior cerebral fossa represents a relatively major surgical procedure, in view of more or less significant per and / or postoperative complications in more than a quarter of the cases. These complications are mainly related to tumor size and intra-axial localization. The high incidence of these complications making the Posterior fossa surgery a high-risk surgery that requires postoperative monitoring at all levels, including the immediate postoperative period in which most serious fatal complications occur. An early and rigorous management will nevertheless allow a favorable evolution in the majority of patients operated. Mortality is mainly related to the fearful haemorrhages of the operative site, edema with acute hydrocephalus and infectious complications, especially meningoencephalic and pulmonary.

Keywords: Posterior cerebral fossa surgery, Complications per or postoperative, Tumor size and intra-axial localization

EP-0745 [Neuro-oncology » Skull Base]

Anterior Clinoidal Meningiomas – A 10-Year Single Centre Experience

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Aim: To analyze a consecutive series of anterior clinoidal meningiomas, microsurgically resected in our Department of Neurosurgery, with special attention to the postoperative outcomes. **Method:** We retrospectively reviewed 36 cases of anterior clinoidal meningiomas, which underwent surgery via pterional and subfrontal approaches between 2007 and 2016. The main presenting symptoms were visual impairment in 83,2%, headache in 36,3%, seizures in 19,4% and frontal lobe syndrome in 19,4%. Physical examination revealed decreased visual acuity in 82,7% and visual field deficit in 36,3%. Meningioma extensions invading the cavernous sinus, present in 27,7% of patients, were left in situ. Complete tumour resection (Simpson Grade I and II) was achieved in 61,1% of cases.

Results: Postoperatively, visual acuity improved in 55,5%, was unchanged in 41,7%, and deteriorated in 2,8%. A transitory

oculomotor palsy was observed in 3 patients (10%), remitted after 3 months. Postoperative clinical and MR imaging investigations were available in all patients for a mean period of 7 years (6 months–10 years), revealing tumor recurrence in 13,9% and tumor progression after subtotal resection in 16,7%.

Conclusion: Anterior clinoidal meningiomas can achieve favourable outcomes after microsurgical resection, despite their high rate of recurrence and progression. Therefore, complete surgical resection of these lesions still remains challenging.

Keywords: Meningioma, Skull base, Clinoid

EP-0746 [Neuro-oncology » Skull Base]

Another Reason Against Endoscopic Endonasal Resection of Olfactory Groove Meningioma - Olfaction Preservation?

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Background: The principal aims when resecting large olfactory groove meningiomas (OGM) are: reduction of mass effect, preservation of visual pathways and anterior circulations. Increasingly, endoscopic endonasal approaches are utilised for resecting OGM with definite loss of olfaction. We hereby explore if transcranial approach for preservation of olfaction is feasible, in order to improve the patients' overall quality of life.

Method: From August 2016, transcranial strategies were employed (unilateral approach to preserve contralateral olfactory tract, or bicoronal approach with strengthening of olfactory tracts) to preserve existing olfaction in patients undergoing OGM resection. A comparative study with prospective cohort and matched retrospective cohort on the preservation of olfaction in OGM was performed, using appropriate statistical analyses.

Results: 6 patients (5F, mean age 66 years, range 53-81) underwent OGM resection from Aug 2016 (Group 1). The matched cohort (2013-2016) consisted of 12 patients (9F, mean age 63 years, range 43-75) (Group 2). The mean maximum tumour diameter was 4.83cm (SD 1.5cm) in Group1, and 5.67cm(SD 1.2cm) in Group2 (p=0.216). Presentations were similar in the 2 groups: cognitive impairment (67% vs 58%); visual disturbance (33% vs 25%); reduced sense of smell (17% each), seizure (17% each) (p=0.98). A unilateral approach was more commonly used in Group1 (4/6, 67%) compared to 25% (3/12) in Group2 (p=0.087). Olfaction was preserved in 83% of cases in Group1 postoperatively, compared to 17% of Group2 patients (p=0.006).

Conclusion: With improvements in microscopic visualization and surgical techniques, preservation of olfaction is achievable and should be considered the gold standard when resecting OGM.

Keywords: Olfactory groove meningioma, Olfaction preservation, Transcranial, Strategies, Effectiveness

EP-0747 [Neuro-oncology » Skull Base]

Correlation Between Radiological and Endoscopic Findings in Pituitary Adenomas Invading the Cavernous Sinus

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Background: The invasion of the cavernous sinus by the pituitary adenomas evident on preoperative MRI is usually considered an important predictive factor regarding both surgical removal and the risk of recurrence. The aim of our study is to evaluate the actual cavernous sinus invasion by pituitary adenomas under direct endoscopic view and estimate the possibility to remove any part of the tumor infiltrating the cavernous sinus by endoscopic endonasal transsphenoidal approach.

Method: From March 2011 to March 2014 we analyzed 35 non-secreting pituitary macroadenomas with pre-operative MRI evidence of invasion of the cavernous sinus and classified according to the classification of Knosp at least as Grade 1 (parasellar extension) or higher. The RM evidence has been correlated with the intraoperative endoscopic direct vision. For each patient we performed post-operative MRI to evaluate the extent of surgical resection.

Results: The adenoma classified as Knosp Grade 1 and 2, during surgery, showed actual cavernous sinus invasion in only 10% of cases and total removal was achieved in all patients. For adenomas Grade 3, the rate of invasion resulted of 38% and a complete removal was possible in 70% of patients. All Grade 4 adenomas invaded the cavernous sinus.

Conclusion: The intra-operative direct endoscopic view showed a real rate of cavernous sinus invasion extremely lower than the pre-operative MRI evidence. The endoscopic endonasal approach may ensure a complete resection even in most adenomas invading the cavernous sinus.

Keywords: Cavernous sinus, Pituitary adenomas, Knosp grade

EP-0748 [Neuro-oncology » Skull Base]

Clinical Features and Surgical Outcomes in Patients with Cerebellopontine Angle Hemangioblastomas: A Retrospective Series of 23 Cases

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Background: Hemangioblastomas in the cerebellopontine angle(CPA) are uncommon and have rarely been reported. They may be easily misdiagnosed because of the atypical location, clinical and imaging features. The present study aimed to characterize clinical and radiological features, treatment strategies and outcomes in these rare lesions and to investigate various factors that may affect postoperative outcomes.

Method: The medical records of patients with CPA hemangioblastomas who underwent surgery from 2003 to 2016

at the West China Hospital were reviewed retrospectively and statistically analyzed.

Results: Twenty-three patients (14 males and 9 females) presented with CPA hemangioblastomas. Eight patients (34.8%) had VHL syndrome. Gross total resection was achieved in 22 patients (95.6%). The mean follow-up was 45.1±36.2 months(range 3-144 months). After surgery, the symptoms improved in 18 cases (78.3%), remained unchanged in 3 cases (13%), and were aggravated in 2 cases(8.7%). Four patients showed the local recurrence during the follow-up (17.4%). Patients with cystic hemangioblastomas had a better neurological improvement(P=0.041) compared with patients with solid tumors. Furthermore, patients with maximal diameter of tumors larger than 3 cm(P=0.035) or solid tumors(P=0.018) showed a higher incidence of postoperative complications. The local recurrence was correlated with VHL disease (p=0.027).

Conclusion: Although hemangioblastomas of the CPA are challenging lesions to treat surgically, they can be removed safely when these lesions are appropriately diagnosed and treated. Patients with VHL disease are more likely to have a local recurrence. A regular follow-up is recommended to detect the local and distant recurrence, even if the clinical course is benign and tumor is totally resected.

Keywords: Hemangioblastoma, von Hippel-Lindau disease, Cerebellopontine angle, Preoperative embolization, Outcome, Recurrence

EP-0749 [Neuro-oncology » Skull Base]

Surgical Management of Midline Anterior Skull Base Meningiomas with Intra-Extracranial Extension

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Background: This study focuses on the midline anterior skull base meningiomas with extracranial extension to the nasal cavity and paranasal sinuses with possible involvement of the orbit. Aim of this study was to develop a topographic classification of midline anterior skull base meningiomas with intra-extracranial extension and an algorithm of their surgical management.

Method: 103 patients (female:male = 2.4:1) aged 8-78 (mean – 50) with histologically benign primary midline anterior skull base meningiomas with intra- and extracranial extension were treated in N.N. Burdenko National Research and Practical Center for Neurosurgery (Moscow, Russia) between 2001 and 2016. The tumors were classified according to the extent of skull base invasion and predominant direction of growth (intracranial, extracranial, or both).

Results: Hyperostosis was associated with intracranial or intra-extracranial origin of tumors. Simpson grade 1-2 resection was achieved in 58.9% of surgeries, and Simpson grade 3-5 resection was observed in 41.1%. Postoperative morbidity was present in 18 patients (17.6%), a total of 4 fatal outcomes were related the disease or treatment. Presence of bulky intracranial portion of the tumor

was associated with higher risk of postoperative complications. Original classification and algorithm for selection of surgical approach depending on tumor localization and extent of resection were developed.

Conclusion: Primary midline intra-extracranial anterior skull base meningioma was observed in 26 cases and should be regarded as a new type of skull base meningioma. The proposed classification serves for the selection of appropriate surgical approach depending on localization and planned extent of resection of the tumor.

Keywords: Skull base tumor, Anterior skull base, Meningioma, Surgical management, Classification, Algorithm

EP-0750 [Neuro-oncology » Skull Base]

Cavernous Sinus Lymphoma

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Background: Although most malignant lymphomas of the central nervous system are thought to arise in the brain parenchyma, those thought to originate primarily in the cavernous sinus is extremely rare, but it must be considered in the differential diagnosis of an enhanced lesion in the cavernous sinus. It may present as cavernous sinus syndrome or isolated facial pain or/and numbness or diplopia. Here we present 7 cases of primary cavernous sinus lymphoma.

Method: 7 with primary patients were operated cavernous sinus lymphoma over 14 years (2000-2014). Age ranged between 43 to 72 years, 4 males, 3 females. 4 presented with facial pain resembling trigeminal neuralgia, 2 with diplopia and one patient with combination of facial pain and diplopia. 4 cases on Rt. Side, 3 on Lt. Side.

Results: Total excision achieved in 6 pat. All patients with facial pain improved after operation, diplopia patients were better but not completely recovered. 2 patients developed additional numbness in trigeminal nerve territory.

Conclusion: Histological diagnosis of lesions in the cavernous sinus is essential to determine the appropriate treatment which in most cases multidisciplinary in order to ensure better prognosis. Primary cavernous sinus lymphoma must be considered in the differential diagnosis of an enhanced lesion in the cavernous sinus

Keywords: Cavernous sinus, Lymphoma, Skull base

EP-0751 [Neuro-oncology » Skull Base]

Retrosigmoid Approach to the Cerebellopontine Angle Tumors - A Single Center Experience with a Systematic Review of Literature

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Aim: To study special features of applying the retrosigmoid suboccipital approach (RSSA) in surgery for cerebellopontine angle (CPA) tumors, the possibilities for expanding the approach, complications and ways of their prevention.

Method: The prospective analysis of the RSSA application in 112 patients with CPA tumors, who were examined and treated in

Mechnikov Hospital from 2010 to 2016 inclusive, has been made. All patients were operated on by the author of the study. TPC tumors were removed using the retrosigmoid approach with the following equipment: microscopes, electrotrepan, ultrasonic dissector aspirator, high-frequency coagulation with bipolar coagulation tweezers, and intraoperative neuromonitoring system.

Results: By applying the RSSA, we removed 67 vestibular schwannomas (VS), 4 non-vestibular schwannomas (3 schwannomas of caudal group of CNs and 1 schwannoma of trigeminal nerve), 30 CPA meningiomas, 7 epidermoid tumors, 1 hemangioblastoma, 1 chondroblastoma, 1 choroid papilloma, 1 cancer mts. Own experience and literature analysis allow to make the conclusions about advantages and disadvantages of RSSA application.

Conclusion: RSSA is a safe and relatively simple technique with a very low percentage of complications. RSSA provides an excellent panoramic examination of the entire CPA and a wide opening of the tumor regardless of its type and size. At all stages dissection is performed under a direct visual control, in such a case the location of the cranial nerves can be determined at an early stage, thus increasing the chances of preserving the nerves and allowing radical removal of the tumor.

Keywords: Retrosigmoid suboccipital approach, Cerebellum-pontine angle, Tumor surgery, Advantages, Disadvantages, Complications

EP-0752 [Neuro-oncology » Skull Base]

Vestibular Schwannoma

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Background: Complete removal of vestibular schwannoma without producing neurodeficit is one of the most challenging operation in neurosurgery. In this subcontinent, most of the patients usually present to neurosurgeon with large size of tumor and in these cases preservation of facial nerve function are very difficult though anatomical continuity well maintained. Aim of presentation is to share our experience of total or near total excision of vestibular schwannoma totally or near totally by drilling internal acoustic meatus without damaging facial nerve or other neural structures with suboptimal facility with our colleagues.

Method: Vestibular schwannomas that were operated from April 2005 to 2016 were studied. We are removing the tumor near totally by drilling the internal acoustic meatus with identification and preservation of facial nerve. In most of the cases, we have to leave last 3-4 mm of tumor capsule. 211 operated patients with vestibular schwannomas were prospectively studied.

Results: Postoperatively facial nerve function was alright in 21 cases (H&B gr1/2) and in rest of the cases (H&B gr 3/4) some form of facial paresis occurred that recovered completely (in few cases) or incompletely. Per operative brain swelling in three cases needed partial cerebellar hemispherectomy, postoperative CSF fistula developed in 05 cases, 03 of them need re-exploration. Four patients expired early postoperative period, three of them due to haematoma.

Conclusion: Aim of vestibular schwannoma surgery is to remove tumor totally or near totally without further neurodamage which can bring cure to the patient. Our initial results are very encouraging.

Keywords: Vestibular schwannoma, Facial n preservation

EP-0753 [Neuro-oncology » Skull Base]**Recurrent Meningioma with Malignant Transformation and Extensive Growth of an Anaplastic Meningioma**

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Meningiomas are common and mostly benign intracranial tumors, but may show a histological progression to malignancy. The mechanisms of malignant transformation remain unclear. Malignant meningiomas usually bear a high recurrence rate and unfavorable prognosis, and multiple surgical resections are required for the treatment. We present a report on a case of 41-year-old woman with a benign frontal base meningioma that was operated 10 years ago at another centre. The patient presented to us with rapid recurrence of this tumor resulting in deformity of the face and orbit. Impaired brain function and subsequent intracranial hypertension caused serious headache, and vomiting with both visual loss and proptosis of both of the orbit. Magnetic resonance image demonstrated a large frontal base mass that extend to nasal cavity with diffuse contrast enhancement and extensive surrounding edema. A craniofacial approach combined by bifrontal approach was performed in multi stage tumor resection. We performed three surgeries with estimated blood loss around 2500 cc for each surgery. Intra operative the tumor was highly vascularized extending into the choanae. The anterior skull base was reconstructed along the nasal cavity, the tumor and the infiltrated duramater were radically removed except for the portion at the carotid arteries. The post operative course was uneventful and there was no further neurological deficit. The patient underwent radiation therapy and there is no recurrence after six months.

Keywords: Recurrent, Anaplastic meningioma, Craniofacial approach

EP-0754 [Neuro-oncology » Skull Base]**A Rare Case of Primary Diffuse Non -Hodgkins Lymphoma in Sphenoid Sinus Presenting as Third Cranial Nerve Palsy**

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Lymphomas are group of malignant neoplasm having origins from lymphoreticular cells. Spheroid sinus as primary site for lymphomas are very rare and whenever involves comes usually with ocular manifestations. The proximity of the lesion to optic nerve and cavernous sinus present a high risk of developing unilateral blindness. The vast majority of cases of localized spheroid sinus lymphomas are usually curable to surgery, chemotherapy alone or combination of both. We report a case of 58 years old male having headache, nausea, vomiting and gradually developing ptosis (Lt) over 15 days. MRI of brain revealed strong homogeneously enhancing lesion occupying sphenoid sinus, clivus extending towards left cavernous sinus and also the sellar region. Gross total resection of tumor was achieved by endoscopic endonasal approach. Histopathology revealed non- Hodgkin lymphoma.

Keywords: Sphenoid sinus, Non Hodgkin lymphoma, Ptosis

EP-0755 [Neuro-oncology » Skull Base]**Meningiomas of the Anterior Cranial Fossa About 31 Cases**

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We report a retrospective study about 31 cases of meningioma of the anterior cranial fossa. Collected in a period of 6 years (2010-2015). Department of neurosurgery, UHC IBN ROCHD, Casablanca. They represent 34.8% of meningioma of skull base. The age varies between 20 and 61 years with an average age of 48,1 years, 77% were female. The clinical features were ICHT (87,1 %), visual disorders (45,1 %), anosmia (42%), Epilepsy (29 %) motor deficit (19,3 %), and mental disorders (12.9 %). Seventy-three percent of the tumors were large (> 4 cm). 49 percent of patients had olfactory groove, 39% had jugum sphenoidale, 10% had cranio-orbital, and 2% had multiple meningiomas. All patients were examined with computed tomography and magnetic resonance imaging, ANGIO-MRI was used in 4 of cases, and angiography brain in 2 cases. Bifrontal approach was used in 52%, pterional approach in 32%, supraorbital approach in 6%. Complete removal was performed in 26 cases (84%); in the remaining 5 (16%), partial removal was performed because of encasement of the carotid artery, or optic nerves by the tumour. Mortality was 9%.

Keywords: Meningiomas, Anterior cranial fossa, Skull base, Bifrontal approach, Pterional approach

EP-0756 [Neuro-oncology » Skull Base]**Meta-Analysis: Acoustic Neurinoma with 2 To 3 Centimeters in Patients Under 50 Years and Preserved Functional Hearing - Surgery Versus Radiosurgery**

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Vestibular Schwannomas are benign tumors from Schwann cells. Through a literature systematic review, we tried to evaluate which is the best treatment option specifically to young patients, with tumor varying to 2 and 3 cm and with preserved hearing. We found 14 systematic reviews and 19 clinical studies that structured our meta-analysis. Average patient age was 55,1 years old, tumors sizing between 0,8 and 4,05 cm³, irradiated with mean marginal dose of 14,38 Gy, with an 89.3% of tumor control, 64.5% of functional hearing preservation, 2.43% of facial nerve lesion and 3% of complications, mainly trigeminal pain. Median follow-up was of 54.5 months. Four meta-analyses evaluated distinctly results of microsurgery. Tumor of all sizes and patients of all ages were included. Results showed preservation of functional hearing in 50.6% of patients and facial nerve lesion in 18%. The most common complication was liquor fistula in 8% of cases and mean follow-up was of 49.7 months. In a general and superficial analysis one can conclude unadvisedly and incorrectly that radiosurgery is a better treatment choice. therefore,

we don't have reliable statistic and bibliographic data to develop a treatment guideline that guarantee which is the best treatment to acoustic neuroma of 2-3 centimeters in young patients with functional hearing. Therewith, due to inadequate studies, treatment choice must be made individually, regarding surgeon experience and ability, availability and patient access to radiosurgery and especially patient choice, which should be informed about short and long terms risks and benefits of each therapeutic option, making reasonable decisions

Keywords: Hearing, Functional, Neurinoma, Acoustic, Surgery, Radiosurgery

EP-0757 [Neuro-oncology » Skull Base]

Malignant Transformation of Craniopharyngioma: 28th Case in English Literature

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Craniopharyngioma histopathologically is a benign tumor while being malignant in behaviour. Malignant transformation of craniopharyngioma is very rare. Here we present the 28th case of malignant craniopharyngioma ever mentioned in English literature. A 44 years old female patient presented with visual loss in both eyes and a complaint of headache. She had previously undergone transsphenoidal surgery for craniopharyngioma 2 years ago. Histopathological examination revealed at that time adamantinomatous craniopharyngioma of Grade I. There was no malignancy. A year later she had gamma-knife therapy for the remnant tumor. At this admission, a brain MRI scan showed recurrence and massive invasion of the nasal cavity, near total destruction of the clivus with compression of the optic nerve and enclaving of the right carotid artery by the tumor. Two phase surgery was performed: the first by ENT surgeons via transmaxillary route where only a subtotal removal could be achieved due to profuse bleeding. Prior to the transcranial intervention, endovascular embolisation of the feeding vessels was performed, bilateral maxillary arteries and right ophthalmic artery had been embolised. In the second stage transcranial surgery, we tried to debulk the mass to decompress the brain, but again severe bleeding occurred in spite of the pre-operative embolisation and the tumor was removed only subtotally. The histopathological examination showed malignant transformation of craniopharyngioma. 2 years later she passed away. This case suggests that malignant transformation of craniopharyngioma can occur and surgery can be challenging because of excessive bleeding

Keywords: Craniopharyngioma, Malignant, Transformation

EP-0760 [Neuro-oncology » Skull Base]

Supra Sellar Meningiomas-Microsurgical Management-Agony and Ecstasy

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Supra sellar meningiomas although majorities are benign, they present formidable challenge due to their proximity to vital areas, vessels, nerves, surgical inaccessibility, aggressive nature. Over last 24 yrs, we have treated 142 cases including all three locations Tuberculum selle, Planum sphenoidale, dorsum selle-region 102. Medial sphenoid wing- 40. Various approaches to skull base used depending on location of lesion. Microsurgical techniques applied in all cases. Anterior midline, Pterional craniotomy used in majority case. Sylvian fissure dissected and opened in all cases. Inter optic, Carotico Optic, Lamina terminalis and retro carotid corridors used to remove the lesions. skull base decompressions done is selective cases to gain the access. In 98/142 we achieved Simpsons type 1 excision. 31/142 underwent subtotal excision. 6 internal decompression. 7 only biopsy. 11 patients subjected to radiation. 14 patients underwent resurgeries, 4 patients reoperated 3 time for recurrence. there were 12 deaths 7 due to primary surgery, 5 due to systemic complications. Follow-up period is 4 months -20 yrs. 105 cases available for follow up. 48/123 had various post op morbidities, visual, hypothalamic and motor majority were reversible over time. 85/105 are independent and functioning normally. Surgical treatment of skull base meningiomas is highly encouraging with satisfactory outcome in majority of cases. Microsurgical techniques are invaluable for good outcome. Modern neuro imaging, Anaesthesia, Multispeciality involvement, In depth microsurgical anatomical knowledge, Reconstruction skills, and post of care are key factors for better outcome. Morbidity and mortality are primarily due vascular injury to Circle of Willis and branches, Hypothalamus, Limbic system and Brain stem. Radiation therapy has small role to play, chemotherapy has no role.

Keywords: Supra sellar meningiomas, Microsurgery anatomy procedures, Optic apparatus, Circle of willis, Pituitary stalk, Hypothalamus

EP-0761 [Neuro-oncology » Skull Base]

Custom Made Cranioplasty with Orbital Involvement: A Single Centre Experience

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Background: Orbital reconstruction in cranioplasties can be technically challenging. Custom made material with pre planned casts can aid in reconstruction which can improve or prevent progression of ocular symptoms. We sought to review our practise and analyse our outcomes

Method: We reviewed the registry of all custom made cranioplasties made at our unit between 2011-2016. We identified those designed

including orbital reconstruction. We then reviewed the clinical notes for indication for cranioplasty, material used, complications, ocular signs or symptoms and their resolution post-op.

Result: 22 cranioplasty patients were identified with a mean age of 40.6 years (17-68). Indications included trauma (13), meningioma (7) and congenital (1). Titanium was used in 19 cases and PEEK in 8 cases. 16/21 had ocular symptoms. Post-operatively there was improvement in diplopia (4/8) but not in vision. Complications included wound infection (1), sinusitis (1) conjunctivitis (1) and a retro-orbital haematoma (1). No cranioplasty was removed due to complications.

Conclusion: Custom made cranioplasty with orbital reconstruction remains well tolerated. Diplopia is the most common ocular symptom to improve. No improvement in vision was reported in our series which reflects long standing visual loss from tumour or trauma. There were no significant differences in complication between titanium and PEEK.

Keywords: PEEK, Titanium, Cranioplasty

EP-0762 [Neuro-oncology » Skull Base]

Malignant Nerve Sheath Tumor of the Orbital Region Arising from Pre-Existing Benign Neurofibroma in an Adolescent Patient of Neurofibromatosis Type 1: A Case Report and Review of Literature

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Malignant Nerve Sheath Tumors (MNSTs) are one of the most rare high grade malignancies usually affecting extremities or trunk. Incidence is 1/Lac. Incidence of MNSTs before 20 years is 1/million. Intra-cranial MNSTs (affecting commonly Cranial Nerves VIII & VII) are even rarer and only few case reports and short series are found in literature. Orbital region intra-cranial MNSTs are rare to the extent that only few case reports are described. In Henderson's series of 764 Orbital region tumors only 2 were MNSTs while in Kennedy's series of 820 cases no MNST was found. Intra-cranial MNSTs are usually sporadic arising de novo. Next common mode is origin from pre-existing schwannomas whereas malignant transformation from pre-existing benign neurofibroma is extremely rare. As per the largest review of 60 reported cases of intra-cranial MNSTs by Benedicte L Heuroux, only 04 arose from pre-existing benign nerve sheath tumors and there were only 4 cases of intra-cranial MNSTs in association with NF-1. Only ONE case is reported where MNST arose from benign neurofibroma in the orbital region. Ours is the SECOND reported case of malignant transformation of benign neurofibroma of orbital region and the fifth case of NF-1 associated intra-cranial MNSTs. Incidence of gross total resection is low (only 15%) owing to critical location and tenacious nature of tumor. We present an interesting extremely rare case of NF-1 affected 16 years old boy with large orbital region intra-cranial MNST arising from pre-existing benign neurofibroma.

Keywords: Orbital region malignant nerve sheath tumor, Malignant transformation, Neurofibromatosis type I

EP-0763 [Neuro-oncology » Skull Base]

Meningoencephalocele of Planum Sphenoidale; Watch Out the Optic Nerve!

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Background: Cerebrospinal fluid leak can occur in sphenoid sinus. Although it is common after fractures caused by blunt head trauma, spontaneous leaks are less common in the sphenoid sinus. In either situation, if there is a considerable bony defect of planum, the subsequent meningoencephalocele can push the optic nerve or chiasm downward or carry it in the sac. This situation is challenging as the encephalocele could not be cauterized or reduced.

Method: Two cases of traumatic and 1 case of spontaneous CSF rhinorrhea due to planum sphenoidale meningoencephalocele are presented with pre- and postoperative imaging and intraoperative videos. All the patients underwent surgery with the endoscopic endonasal approach, and the defects were closed using a multi-layer technique.

Results: The patients included 1 man (25 years old) and 2 women (23 and 26 years old). The surgeries were successful with no visual complication or recurrence of the leak.

Conclusion: This series, although numerically limited, discusses the surgical management of this entity and highlights the need for surgeons to be aware of the possibility of damage to the optic nerve in the encephalocele of planum sphenoidale. The need for simultaneous evaluation of sagittal images of CT scan and MRI for the proper diagnosis should be reemphasized.

Keywords: CSF leak, Sphenoid, Planum, Endoscopic, Repair

EP-0764 [Neuro-oncology » Skull Base]

Epidermoid and Dermoid Tumors of Pontocerebellar Angle: 33 Cases

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Background: Pontocerebellar angle tumors are crucial tumors in terms of clinical and pathological definitive diagnosis. The tumors in this region are usually schwannomas and meningiomas. Epidermoid and dermoid tumors are observed rarely. Epidermoid tumors only include squamous cell layer while dermoid tumors are found in all layers of the dermis.

Method: In this article, 33 pontocerebellar angle epidermoid (28) and dermoid (5) tumor cases have been evaluated retrospectively.

Results: 19 were male and 14 were female between the ages of 17-68. 25 patients were experienced headaches, 9 had hearing loss, 4 facial paralysis and 28 showed irregularities in cerebellar tests. Patients have been assessed with brain CT, brain MRI, diffusion MRI, FLAIR images and hearing tests before the operation. All patients were operated with lateral suboccipital approach in sitting position. Intraoperative neuromonitorization and facial EMG were performed. Epidermoid or dermoid tumors were totally removed from 25 patients and subtotally by 8 patients. In early controls after

the operation, no changes were observed in the hearing of 9 patients. Facial paralysis of one out of 4 patients progressed. In addition, facial paralysis developed in 2, meningitis in 3, subdural hematoma on the 6th postoperative month in 1, reoperation due to CSF leak in 1, temporary lower cranial nervous palsy was observed in 1 patient. Due to development of hydrocephalus, V-P shunt was placed in one patient.

Conclusion: Majority of patients with pontocerebellar tumors apply with complaints including hearing loss, facial paralysis, cerebellar symptoms and headaches. Diffusion MRI and FLAIR MRI images are crucial for definitive diagnosis. Total or almost total resection is achieved with surgical operation. Maximum attention should be paid during operation as tumors are attached to neural and vascular structures.

Keywords: Pontocerebellar angle, Epidermoid tumor, Dermoid tumor, Surgery, Results

EP-0765 [Neuro-oncology » Skull Base]

Lung Metastasis in the Olfactory Region

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Meningiomas are commonly benign tumors and consist of arachnoid cap cells. They are encountered approximately 20% of all primary intracranial tumors. 4-13% of all intracranial meningiomas are located in the olfactory groove area. These olfactory groove meningiomas are generated from cribriform plate and frontosphenoid suture. These tumors have a slow reproduction rate and eventually, may present with bilateral frontal lobe compression findings. CT is the primary imaging in the diagnosis; thus, the relation between the tumor and bony structures are detected. Surgical approach is decided with MRG and MR venography. 56 years old male patient with a history of lung cancer was admitted to the hospital with dizziness, dim sight and headache. Extraaxially located, heterogenous weak contrasted with limited diffusion, approximately 56*48*41mm in size meningioma at the olfactory groove level on anterior scalp was detected at admission imaging. Edema was present on bilateral frontal gray matter secondary to meningioma. The patient was operated with olfactory groove meningioma. The pathologic examination revealed similar immunohistochemical features with the biopsy samples taken from the pulmonary lesion, so it was concluded as brain metastasis of the primary tumor. Although the MRI was evaluated as olfactory groove meningioma, the pathology of the lesion revealed metastasis of the primary lung cancer.

Keywords: Meningioma, Metastasis, Olfactory groove

EP-0766 [Neuro-oncology » Skull Base]

Cavernous Sinus Surgery- Serving the 'BOSS (Base of Skull Surgery)'

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The progressive refinements of imaging techniques have helped

neurosurgeons delineate pathologies close to the skull base, an arena wherein, so far, even angels feared to tread. Base of Skull Surgery-BOSS- has come of age as a super-specialty that must turn safer and easier as the years roll by. The crowding of structures on either side of sella turcica and sphenoid sinus has forced anatomists into describing cavernous sinus as an area through which cranial nerves and carotid artery course. A little embryological retrospection will clarify the issue for us. The cranial nerves have a well defined dural and arachnoid covering in their course along the cavernous sinus which keeps them isolated from direct contact with the venous blood. The site of origin of the lesion, and its nature, determine the extensions and displacements in the cavernous sinus. The direction of approach holds the key to successful resection of cavernous sinus lesions. The BOSSist, working or in the making, has to be most Hippocratic- Primum, non nocere. Towards this end, it is important that a BOSSist appreciates the epigenetic sequence that fashions all the blood vessels, nerves, and meninges first and then the skull base, as an afterthought later. A clear understanding of the forgoing will lead the BOSSist to have a mental picture of tissue planes that separate pathology from the neighboring structures. Hands-on experience would reveal these concepts to be verifiable realities that can be put to the advantage of the patient and the ease of the surgeon.

Keywords: Cavernous sinus, Surgery, Tumors, Dural relationships

EP-0767 [Neuro-oncology » Skull Base]

Endoscopic Assisted Skull Base Surgery

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Aim: To perform a risk assessment of endoscope-assisted microsurgery via transcranial approaches for different skull base lesions.

Method: We evaluated 70 patients who underwent endoscope-assisted surgery for various pathologies of the skull base via transcranial approaches from February 2010 till March 2015 at the Neurosurgical Department. Retrospectively we analyzed the patient charts, operating reports, pre and postoperative imaging, intraoperative video recordings, ICU charts and follow-up data. We focused on morbidity and mortality due to the endoscopic procedure. All surgeries were performed combining microscope and rigid endoscope. The angled optics were introduced under direct microscopic control.

Results: Mean age at surgery was 45 years (range 9-83y); 62% were male and 38% female. The pathologies treated were: Vestibular Schwannoma (38), Epidermoid cyst (17), Posterior circulation aneurysms (6), Trigeminal ganglion lesion (2) and Anterior circulation aneurysms (9). These cases managed by the following approaches: lateral suboccipital retrosigmoid (59) and pterional (11). Complications were in the form of 17 cases of cranial nerve injury (1 trochlear paralysis, 16 facial palsy). All deficits were temporary post-operative and recovered in the follow-up. Except the trochlear nerve injury and one case of facial palsy which needed sural graft. Further occurred 1 postoperative infection, 4 CSF fistula, 1 postoperative bleeding, 1 pneumocephalus, 1 vascular insult (PICA). Mortality rate was zero.

Conclusion: The endoscope was helpful tool allowing exploration

of the hidden areas of skull base minimizing drilling and retraction of neurovascular and brain structures. Using endoscope as assisting tool to the microscope enables safer surgery for different skull base lesions even with lesions not visible in a straight line with microscopic view. The risks due to insertion of the endoscope under microscopic guidance are low. The time of procedure is short.

Keywords: Endoscopic neurosurgery, Skull base, Minimally invasive

EP-0768 [Neuro-oncology » Skull Base]

Simultaneous Occurrence of a Planum Sphenoidale Meningioma and a Pituitary Adenoma in the Same Patient: A Case Report

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Coexistence of two sellar region tumors in an adult is a rare condition, and usually only one is clinically symptomatic. We present this case in order to discuss the management of these tumors. We present the case of a 59-year-old man with no past medical history, presenting an optic chiasm syndrome, evolutive over one year. The prolactin level was very elevated. The MRI showed two different lesions: one was intra sellar compatible with an adenoma and the second on the planum sphenoidale compatible with a meningioma. A fronto lateral approach was performed for the supra sellar lesion with total removal. The prolactinoma was treated medically using bromocriptin. When these two lesions are discovered with the MRI, the surgical approach should be discussed taking into consideration many factors: tumor size, imaging characteristics, symptoms, bleeding risks, and the possibility of a medical management of one or the other tumor. Typically, the most symptomatic lesion will be first approached. The choice between a cranial approach and a transphenoidal approach will be discussed. Medical treatment and surgery can be used in management. To operate simultaneous occurrence of meningioma of sellar region and an adenoma, the cranial approach is frequently used. In some circumstances, the transphenoidal approach can also be performed. The right surgical indication and approach require a good analysis of the MRI.

Keywords: Sellar region, Meningioma, Pituitary adenoma

EP-0769 [Neuro-oncology » Skull Base]

Petroclival Meningiomas: Choosing the Right Approach

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Background: A retrospective analysis of 129 cases of petroclival-premeatal meningiomas surgically managed in their institute from 1st Jan 1990 till 30th June 2014 was carried out to see the outcome with various approaches.

Method: While the tumor resection was carried through an anterolateral/lateral route in 35(23%), it was through a combined posterior subtemporal /pre or trans-sigmoid (posterior petrosal)

in 24(19%) & retrosigmoid supra-paracerebellar route in 61 cases (47%). In three cases with extra cranial extension to infratemporal area, a modified Fisch approach was used. Six patients who were in poor clinical condition had only a CSF diversionary procedure. The tumor could be radically removed in 78 patients (63%), subtotally in 27 (22%) and decompression only in 11. Seven patients had tumor excision in two stages. There was an operative mortality of 7.7% (10 cases).

Results: Forty three of the 59 patients who underwent surgical decompression since Jan 2004 were operated by the retrosigmoid route and operative mortality for this group of 53 patients have been less than 3.3%(2 cases). There was only one operative mortality among the last 43 cases operated by the retrosigmoid route. Out of the 97 patients on long term follow up 67 are independent. Eleven out of the thirteen patients who had symptomatic recurrence were re-operated.

Conclusion: Many of the premeatal-petroclival meningiomas without significant middle fossa extension can be removed by conventional retrosigmoid route with reduced morbidity and mortality

Keywords: Petroclival, Retrosigmoid, Petrosectomy

EP-0770 [Neuro-oncology » Skull Base]

Endolymphatic Sac Tumor Presenting as a Mass in Cerebellopontine Angle: Case Report and Literature Review

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Endolymphatic sac tumor (ELST) is a rare slow growing neoplasm with benign histopathological appearance and clinically destructive behavior which occurs in the skull base and frequently invades the posterior petrous bone, the mastoid, semicircular canal, cerebellopontine angle structures and cranial nerve. It is extremely rare in the general population and has an association with von Hippel-Lindau disease. It has been steadily characterized principally in the otologic literature. However, only a limited number of such cases have been presented by neurosurgeons, constituting a rare differential diagnosis for cerebellopontine angle (CPA) tumors of extradural origin. We present a case of a papillary tumour at the cerebellopontine angle in a 32-year-old man. He presented with tinnitus vertigo and ear pain associated with dizziness, and hearing loss. CT scan of the temporal bone showed a destructive tumor at the left cerebellopontine angle. Surgical excision was performed and the diagnosis of the endolymphatic sac tumour was made. ELST should be taken into consideration for differential diagnosis of CPA tumors. Detailed clinical and radiographic evaluation is required to direct an appropriate management in every individual. Radical excision is feasible using appropriate surgical approach. Early diagnosis, surgical excision and long-term regular follow-up may constitute an efficacious management.

Keywords: Endolymphatic sac tumor, Cerebellopontine angle, Papillary tumor

EP-0771 [Neuro-oncology » Skull Base]

Early Results of Endoscopic Transsphenoidal Surgery in Cushing Patients

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Aim: To evaluate the postoperative results obtained in patients with pituitary adenomas who were treated with endoscopic endonasal transsphenoidal surgery for Cushing disease in the presence of excessive ACTH-secreting pituitary adenomas due to increased cortisol production. As soon as the diagnosis is made, the hormonal balance should be corrected by arranging the necessary treatment. Surgery is recommended as a treatment in diagnosed patients. Medical treatment is used as an adjuvant. Glucocorticosteroids replacement need is shown as an early indicator of remission and total tumor resection. Reoperation should be considered if residue is detected after surgery. Also surgery should be considered if recurrent adenomas are detected in long-term follow-up. Radiotherapy can be planned if surgery is not beneficial.

Method: Twelve cases with positive staining with postoperative biopsy-proven acth were evaluated in our clinic between 2014-2016. Preoperative and postoperative hormonal outcomes and MRI images were compared with the literature.

Results: Twelve of the patients were evaluated as corticotropinoma. In 8 of the 12 cases, remission was achieved only by surgical treatment. Not achieved in 4 patients. 3 of these 4 cases were given remission by medical treatment after surgery. 1 case was reoperated with the cause of recurrence and remission provided after second operation.

Conclusion: The first treatment option in Cushing's disease is the surgery. The purpose of treatment is total removal of adenoma. The surgical method chosen should be determined by the size and extent of the tumor. Endoscopic end-to-end transsphenoidal surgery approach is promising with its complication rates and results.

Keywords: Cushing, Endoscopic, Transsphenoidal

EP-0772 [Neuro-oncology » Skull Base]

The Value of the Intraoperative MRI in Resection of Skull Base Chordomas

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Background: We are evaluating the value of the iMRI in achieving maximal safe resection of skull base chordomas.

Method: Retrospective analysis of patients with skull base chordoma, who were operated at INI Hannover between 2010 and 2016, under navigation guidance and iMRI control (Magnetom Espree Siemens AG Medical Solution). The preoperative images, the operative data and findings, the intraoperative MRI images

and the surgeon's expectations before performing the control were evaluated.

Results: Nine patients with skull base chordoma were operated under iMRI control. Three patients had recurrent tumors. Two patients, operated first without iMRI, underwent redo surgery under iMRI. All the patients harbored tumor that extended into 2 or more skull base compartments. Five patients had intradural part of the tumor. The aim of surgery was gross total tumor resection in 5 patients. In four patients (50%), the aim of surgery was tumor debulking and brainstem decompression. Gross total resection was achieved, as planned, in 5 cases. Tumor debulking and decompression of the brainstem were performed in 4 cases. Repeated intraoperative control was necessary in four patients in whom the iMRI showed inadequate resection and/or inadequate decompression of the brainstem.

Conclusion: The iMRI is useful during resection of complex skull base chordoma which involves multiple skull base compartments. It can confirm the gross total resection of the tumor and also give an idea about the degree of debulking and brainstem decompression.

Keywords: Intraoperative MRI, Imaging, Skull base chordoma, Functional preservation

EP-0773 [Neuro-oncology » Skull Base]

The Trans-Sinusal Frontal Approach in Removing Olfactory Groove Meningiomas Our Experience About 24 Cases

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Background: Olfactory groove meningiomas which account for 10% of all intracranial meningiomas, arise in the midline over the cribriform plate and frontosphenoidal suture. It is well known that most of these tumors occupy the floor of the anterior cranial fossa.

Method: We report on our experience with the trans-sinusal frontal approach in removing olfactory groove meningiomas in the department of neurosurgery of Annaba (Algeria).

Results: From January 2006 through January 2016, We operated 24 patients with olfactory groove meningioma tumors. We have (16 females and 8 males). Patient age ranged from 32 to 73 years (average 54,46 years). Tumor diameter varied from 18 to 75 mm (average, 46,92 mm). Total removal was obtained in 22 patients (91.7%). The post operative complication was cerebro-spinal fluid (CSF) leak, which occurred in 3 patients and meningitis in 02 patients. 03 patients were dead in post operative.

Conclusion: The trans-sinusal frontal approach represents an excellent way for tumours developed in the central anterior skull base, especially for olfactory groove meningioma, whatever their size.

Keywords: Meningioma, Transfrontal, Sinus

EP-0774 [Neuro-oncology » Skull Base]

Petroclival Meningiomas Resected via Combined Transpetrosal Approach: Surgical Outcomes in 60 Patients and a New Scoring System for Clinical Evaluation

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Background: Surgical results of petroclival meningiomas are quantitatively evaluated with the objective measurement of the tumor volume and a new impairment scoring system of the patient's condition.

Method: Between January 1990 and December 2009, we used combined transpetrosal approach to operate on 60 patients for benign (WHO grade 1) petroclival meningiomas. All patients were analyzed with detail regard to tumor volume, tumor resection rate (TRR), long-term tumor control, neurological outcomes and patient's condition retrospectively. New scoring system of patient's condition, petroclival meningioma impairment score (PCMIS), was created for quantitative assessment of patient's state. Patients were divided into two groups for comparisons according to the operative period: early group, from 1990 to 1999, and late group, from 2000 to 2009.

Results: In 24 cases of early period (1990-1999), the mean follow-up period was 149.3 months. TRR was 96.1% and long-period good tumor control was obtained in 22 patients (91.7%). PCMIS improved in 3 patients (12.5%), remained stable in 1 (4.2%), and worsened in 20 (83.3%). In 36 cases of late period (2000-2009), the mean follow-up period was 77.9 months. TRR was 92.7% and long-period good tumor control was obtained in 34 patients (94.4%). PCMIS improved in 23 patients (63.9 %), remained stable in 5 (13.9%), and worsened in 8 (22.2%).

Conclusion: Modern combined transpetrosal approach has provided the satisfactory functional improvements and the excellent tumor control to patients with petroclival meningiomas. PCMIS is useful for quantitative assessment of patient's state.

Keywords: Impairment scoring system, Outcome, Petroclival meningiomas, Quantitative evaluation

EP-0775 [Neuro-oncology » Skull Base]

Vestibular Schwannoma Microsurgery. How to Avoid Post-Operative Infection?

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Background: Cerebrospinal fluid leak (CSFL) and intradural infection represent common complication after vestibular schwannoma (VS) surgery. The aim of the work was to show the minimally invasive method for its management and prevention of all infectious complications.

Method: All diagnosed lateral variants of CSFL were managed with puncture, complete aspiration with or without tissue glue injection, and wound compression. Medial variant of CSFL were managed with reoperation. There was a retrospective analysis of all 333 patients undergoing retrosigmoid-transmeatal (RSA) VS microsurgery between 1997 - 2012 (90% grade III - IV tumors; all but 3 cases were radically removed). During the surgery drilled internal auditory canal and opened pneumatic system were sealed with muscle plug and tissue glue. Dura was closed first. Bonyflap and pate were used for craniotomy defect closure. Cefalosporin 3rd generation were used perioperatively.

Results: Lateral variant of CSFL with epidural CSF collection

occurred in 208 cases (62,5%). 208 cases had puncture, aspiration with eventual tissue glue injection (84 cases, 1-6 applications) and wound compression. Medial variant of CSFL occurred in 2 cases (0.6%) and were managed with wound re-exploration. During the period of 1-15 years none of the 333 operated patients had wound, intracranial infection or meningitis.

Conclusion: Postoperative infection in case of VS RSA microsurgery is avoidable. The relatively conservative management of lateral CSFL with postoperative puncture, complete aspiration and tissue glue injection into the pseudomeningocoele solves this problem. It does not need any lumbar drainage, shunts or wound revision.

Keywords: Vestibular schwannoma, Acoustic neuroma, Cerebrospinal fluid leak, Wound infection, Meningitis

EP-0776 [Neuro-oncology » Skull Base]

Endoscopic Endonasal Approach to Sellar Suprasellar Area. Fine Tuning of the Indications and Limitations

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Background: The Endoscopic Endonasal Approaches to Skull Base is relatively new approach which gained a lot of reputation in the last decade. Initial indications were limited but was followed by a wave of expanding the indications to reach a wide spectrum of pathologies. Follow up of surgeries done after this wave dictated some revision on the suitability of this approach for all the pathologies treated.

Method: 18 cases of EEA cases were performed by the authors in Cairo University Hospitals in the period between 2014 and 2016. all clinical data, labs, visual fields, MRI brain and CT of the paranasal sinuses were done before and after surgeries.

Results: Our results showed that this approach should not be limited to infrachiasmatic craniopharyngioma and can be safely used for suprachiasmatic ones specially if it had a big cyst. meningiomas should be limited to soft tumors with no calcifications and better be limited to the tubercular sellae meningioma.

Conclusion: The indications and limitations of EEA to skull base should be continuously revised up till long term follow ups are available for such approach

Keywords: Skull base, Endoscopic endonasal, Craniopharyngioma, Tuberculum meningioma

EP-0777 [Neuro-oncology » Skull Base]

Trigeminal Autonomic Cephalgia Secondary to a Large Meningioma of the Left Sphenoidal Wing Resected via Transzygomatic Approach Assisted by Microscopy and Neuronavigation

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Trigeminal autonomic cephalgias, are cluster headache, paroxysmal hemicrania, short-lasting unilateral, neuralgiform headache, attacks with cranial autonomic features (SUNA), One differential diagnosis are tumors intracranial. Female 63

years, hemicranial headache of 20 years of evolution, stabbing, intermittent duration of 3-5 minutes, no improvement with NSAIDs or topiramate, with small left eye sensation, tearing and nasal congestion. Left eye with 50/20 visual acuity, left hemifacial hyperesthesia, discrimination condition of two hemifacial left points, conjunctival reflex, corneal and masseter reflexes decreased. Magnetic resonance imaging at the left sphenoid wing, size 6x6.7 cm, irregular borders, heterogeneous, extraaxial. In view of the lack of improvement of the patient with the medical treatment with topiramate and lamotrigine, an imaging study was ordered to make differential diagnoses, detecting an extraaxial tumor at the left sphenoid level, which was resected via transsphenoidal, assisted by microscopy and guided by neuronavigation, obtaining a Simpson 3 and transoperative report of atypical meningioma, the patient exits without neurological additional deficit and with remission of trigeminal headache suna type. In view of the presentation of a long-term autonomic trigeminal headache with poor response to medical treatment and in an elderly patient, differential diagnosis should be made with intracranial tumors such as pituitary tumors, parasellar meningioma, sphenoidal, tentorial, high cervical, among others how infections, facial trauma, idiopathic intracranial hypertension, tools hunt syndrome, maxillary sinusitis.

Keywords: Trigeminal headache, SUNA, Meningioma, Magnetic resonance, Neuronavigation, Microscopy

EP-0778 [Neuro-oncology » Skull Base]

Skull Base; Past, Present and Future

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Skull base surgery is one of the most challenging fields in neurosurgery. four decades ago many areas in skull base were considered as no mans land. interdisciplinary cooperation remain a main feature of such a speciality. The auther will present the different aras of surgery and how our better knowledge of microanatomy and achievements in neuroradiology, neuroanesthesia and technology has improved our results. Endoscopic surgery has gained a lot of popularity in the last ten years. Oncological control and a good quality of life is mandatory. Building experience through training programs is one of the key stones in progress. Technology in future is our key in further progress and the auther presents some of these options

Keywords: Skull base, History, Technology, Future

EP-0779 [Neuro-oncology » Skull Base]

Skull Base Tumors and Highly Vascular Brain Tumors. The Role of the Endovascular Treatment

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Debate remains on several aspects of embolization including selection of the most appropriate tumors for embolization, choice of embolic agent, volume of embolic agent to be used, timing prior open surgery/radiation and the decision of which vessel(s) to embolize. This detailed review of pertinent vascular anatomy,

embolization technique, results and complications should allow practitioners to maximize treatment outcomes in this setting. We present a recall of ten years of experience in our service.

Keywords: Skull base tumor, Highly vascular brain tumors, Embolization, Endovascular

EP-0780 [Neuro-oncology » Skull Base]

Microanatomy of Transorbital Endoscopic Approach to the Middle Cranial Fossa

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Background: Transorbital approaches are becoming more popular in surgery of select kinds of pathology of the anterior and middle skull base. Aim of this study was to evaluate advantages and limitations of minimally invasive endoscopic superolateral transorbital approach to the middle cranial fossa lesion.

Method: 10 cadaver head specimens (20 sides) with color-injected vessels were dissected. Surgical technique included resection of the greater sphenoid wing, access to the middle cranial fossa and to the optic canal. Illustrative clinical cases are presented.

Results: Stepwise dissection was accomplished with exposure of lateral and medial structures in the middle cranial fossa. First, superior orbital fissure led to the interdurally localized nerves (III, IV, and V1) in the lateral wall of the cavernous sinus, and then the sinus cavity containing VI nerve and internal carotid artery was explored. Next, Meckel cave was entered with additional opening of the foramina rotundum and ovale. Intradurally the sylvian fissure with middle cerebral artery and temporal lobe structures were exposed. Finally, unroofing of the optic canal and transection of the falxiform ligament was carried out transorbitally.

Conclusion: The transorbital approach is a safe, proximal and less traumatic approach to the sphenoid wing region and to the optic canal in comparison to the standard transcranial or endoscopic endonasal procedures. It provides access the Meckel cave, cavernous sinus, mediobasal temporal area, and optic canal. Select sphenoid wing meningiomas and other intradural pathologies can be successfully treated using this approach with comparable functional outcome and good cosmesis.

Keywords: Sphenoid wing, Transorbital approach, Transorbital neuroendoscopic surgery, Meningioma, Middle cranial fossa, Optic nerve decompression

EP-0781 [Neuro-oncology » Radiosurgery]

Hypofractionated Radiosurgery for Benign Perioptic Tumors: Tumor Control and Visual Outcome

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Aim: To investigate the relationship between dosimetric factors,

tumor control rate, and occurrence of RION among 42 patients treated with hypofractionated radiosurgery.

Method: From June 2011 to July 2015, 42 patients with perioptic tumor underwent hypofractionated radiosurgery (hSRS) at Asan medical center. Among 42 patients, 22 patients (52%) had a meningioma, ten patients (24%) had a pituitary adenoma, four patients (10%) had a craniopharyngioma, four patients (10%) had a hemangioma, two patients (5%) had a schwannoma. All tumors were located within 2mm of the anterior visual pathway. 16 patients (38%) had undergone previous tumor resection, one patient (3%) had previously been treated with hSRS and no patient had previously treated with conventional fractionated radiotherapy. Hypofractionated radiosurgery was delivered in five sessions. Radiologic and ophthalmologic evaluations were performed preoperatively, and 3 and 6 months after hSRS and then annually.

Results: The mean follow-up was 22 months (range, 6-44 months). Tumor control was achieved in 40 patients (95%). Visual function improved in 13 patients (31%), showed no interval change in 25 patients (60%), whereas three patients (7%) experienced a worsening of visual function. Among three patients, two patients experienced deterioration of visual function due to tumor growth. One patient (2.4%) suffered a radiation-induced optic neuropathy.

Conclusion: Hypofractionated radiosurgery is safe and effective treatment modality for treating benign perioptic tumors. We advocate hypofractionated radiosurgery can be a treatment alternative for patients who are not eligible for surgery.

Keywords: Perioptic, Hypofractionated dose, Radiosurgery, Radiation-induced optic neuropathy

EP-0782 [Neuro-oncology » Neuro-endocrine]

Brain Metastasis of Pheochromocytoma: Rare but Plausible

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Pheochromocytomas are rare tumors that arise from chromaffin cells. Pheochromocytomas are only considered malignant when they metastasize to regions without chromaffin tissue. Lymph nodes, liver, lung and bone are the most frequent site of metastasis. Brain metastases are extremely rare. We report a case of intracranial functional pheochromocytoma arising from the dura in a patient surgically treated for an adrenal pheochromocytoma two years ago. Twenty nine year old woman, was diagnosed with right adrenal pheochromocytoma when she presented with episodic abdominal pain. She underwent right adrenalectomy. Postoperative metaiodobenzylguanidine (MIBG) scintigraphy showed no fixing. Plasmatic and 24 hours urine catecholamines' dosage were in normal range. Fourteen months later, she was admitted in neurosurgical department with 10 days history of headache and

vomiting. Clinical examination revealed cerebellar syndrome. Cerebral CT scan and MRI showed a solid lesion on the left superior aspect of the posterior fossa. Tumor and surrounding dura were completely removed through a left retro sigmoid approach. The histopathologic findings were compatible with a metastatic pheochromocytoma. Patient underwent cerebral radiotherapy. Cerebral CT scan showed no lesion and the postoperative MIBG scintigraphy was normal. Six months later, she underwent bilateral adrenalectomy for a local recurrence and neurosurgery for cerebellar metastasis recurrence. Patient died one month after surgery. Although rare but plausible, occurrence of brain metastases in pheochromocytoma patients presenting with suggestive features needs to be considered, after duly excluding an alternative brain primary.

Keywords: Pheochromocytoma, Metastasis, Brain tumor, Surgery

EP-0783 [Neuro-oncology » Neuro-endocrine]

Experience of Transsphenoidal Pituitary Surgery in Lagos, Nigeria

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For many decades transnasal approaches to the sellar region did not gain much attention in Nigeria either due to lack of necessary equipments or lack of expertise in some cases. This is a prospective audit of Transnasal surgeries for pituitary macroadenoma in our center, our experience so far and the lessons learned. An 8 year study of patients with pituitary lesions treated via transnasal route between February 2009 and January 2017 was carried out. Patients' demographics, clinical features, radiologic imaging and hormone assays were documented. The procedures (microscopic or endoscopic procedures based on size of lesions and choice of the surgeon), outcomes and complications were documented. There were 88 cases of pituitary Macroadenoma, 42 of which were giant pituitary adenomas. Age range was from 24 to 76yrs. The major presenting features were visual impairment or total blindness, headaches, infertility and apoplexy. 32 patients underwent purely endoscopic procedures. The most common postoperative complication was transient diabetes insipidus. Other complications were headaches, transient cerebrospinal fluid leak in one patient, tension pneumocephalus, Subarachnoid haemorrhage, panhypopituitarism and death. Trans-sphenoidal approach is a safe and effective treatment for pituitary and other parasellar tumours. Considerable experience and expertise have become available in Nigeria to serve the West African region. Surgical complications in our series have been minimized after the first year. The adoption of a team approach in perioperative care has helped improve our outcome

Keywords: Pituitary adenoma, Transsphenoidal surgery, Endoscopic transsphenoidal surgery

EP-0784 [Neuro-oncology » Neuro-endocrine]**Endoscopic Extracapsular Resection of Pituitary Adenomas and Assessment of Outcomes**

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Background: Extracapsular approaches for pituitary adenoma resection have been reported as early as 1975 by Hardy. Nevertheless, the histological development of the pseudocapsule and its use a surgical resection plane has only been thoroughly highlighted in 2006. It has been proven to elevate the postoperative remission rate and reduce the risk of recurrence. However this technique was primarily described using the operating microscope and only a few attempts to use the endoscope were published up to our knowledge. **Method:** Forty-eight patients with pituitary adenomas underwent endoscopic transsphenoidal surgery utilizing the pseudocapsule as a surgical resection plan, in the period between 2010 and 2017. Remission was defined as postoperative normalization of hormonal hypersecretion in functioning adenomas and evidence of complete resection on postoperative radiological assessment in non-functioning adenomas.

Results: Remission was achieved 85% (n=40), with a mean follow up period of 32 months. The pseudocapsule was demonstrated histologically in 36 patients. Intraoperative CSF leak was encountered in 12 patients (25%), however with appropriate repair only 3 patient (6%) experienced post-operative leakage. The most serious complication met was meningitis in one patient. Other complications noted were diabetes insipidus and sinusitis. No recurrence was observed during the follow up period.

Conclusion: Endoscopic pseudocapsule based extracapsular resection provides a feasible, reasonably safe and highly effective surgical technique for pituitary adenoma resection with a high remission rate and reduced risk of recurrence.

Keywords: Endoscopic, Pituitary, Transsphenoidal, Pseudocapsule

EP-0785 [Neuro-oncology » Neuro-endocrine]**Pulmonary Adenocarcinoma Revealed by Pituitary Metastasis**

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The pituitary tumors are mostly adenomas, carcinomas are rarely metastasis to the pituitary gland is an uncommon and is rare. M.56 year old man.admitted to the endocrinology service for a covered therapeutic and exploration of a sellar mass, the process has an intrasellar extension was compatible with a craniopharyngioma. Smoking history:2 to 3 packs/day for 20 years. No special medical,or surgical history. No concept of diabetes, high blood pressure or similar case in family. Around 4 months before admission, the patient began experiencing headaches rebels to usual painkillers requiring a neurology consultation. brain CT revealed a pituitary adenoma,completed by hormone balance test that showed: PRL:37,46 (1,61-18,77)-TSH:0,57 (0,27-4,20). The patient was started on parlolel 1CP/day The patient showed

no improvement and starts to have visual disturbances and ptosis with increased intracranial tension.his neurologist do brain MRI which showed a sellar process with intrasellar extension and compressive calcifications with discreet hydrocephalus evoking first a craniopharyngioma. The laboratory test results showed a low thyroid function: TSH:0,09µui/ml (0,27-5), FT4:6,66pmol/L (10,6-19,4). The ophthalmologic examination find paralysis of the common motor nerve on the right side and the external motor nerve on the left side (diplopia). The left photopupillary reflex was absent (dilated fundus examination) showed papilla slightly blurred on temporal contours.The rest of the exam was normal. The patient underwent surgery by a frontopterional approach. the histological findings identified the mass as an adenocarcinoma compatible with a metastatic lung cancer. probably original pulmonary. Metastasis of the hypothalamic pituitary region is uncommon but not exceptional. representing 1% to 6% of the pituitary lesions in the literature.

Keywords: Pituitary metastasis, Adenocarcinoma, Surgery

EP-0786 [Neuro-oncology » Neuro-endocrine]**Sinonasal Outcomes of Endoscopic Endonasal Versus Microscopic Sublabial Transsphenoidal Surgery for Nonfunctioning Pituitary Adenomas**

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Background: Both endoscopic and microscopic transsphenoidal approaches are accepted techniques for the resection of pituitary adenomas. Although studies have explored patient outcomes for each technique individually, none have prospectively compared sinonasal and quality of life outcomes in a concurrent series of patients at the same institution, as has been done in the present study.

Method: Patients with nonfunctioning adenomas undergoing transsphenoidal surgery were assessed for sinonasal function, quality of life, and pain using the Sino-Nasal Outcome Test-20 (SNOT-20), the short form of the Nasal obstruction Symptom Evaluation (NOSE) instrument, the SF-36, and a headache scale. Eighty-two patients undergoing either endoscopic (47 patients) or microscopic (35 patients) surgery were surveyed preoperatively and at 24–48 hours, 2 weeks, 4 weeks, 8 weeks, and 1 year after surgery.

Results: Patients who underwent endoscopic and microscopic transsphenoidal surgery experienced a similar recovery pattern, showing an initial increase in symptoms during the first 2 weeks, followed by a return to baseline by 4 weeks and improvement beyond baseline functioning by 8 weeks. Patients who underwent endoscopic surgery experienced better sinonasal outcomes at 24–48 hours and 8 weeks. By 1 year after surgery, no significant differences in sinonasal outcomes were observed between the 2 groups. Headache scales at 1 year improved in all dimensions except duration for both groups with 80% of either microscopic or endoscopic patients experiencing improvement or resolution of headache symptoms. Endoscopic and microscopic patients

experienced similar improvement in quality of life at 8 weeks and by 1 year.

Conclusion: Patients who underwent either an endoscopic or a microscopic approach experienced the greatest nasal symptoms at 2 weeks postoperatively and exhibited similar time courses of recovery in nasal, headache, and quality of life assessments. Patients who underwent endoscopic surgery experienced significantly fewer nasal symptoms during the first 8 weeks compared to the microscopic group, however by 1 year after surgery, there were no significant differences between the 2 groups.

Keywords: Transsphenoidal, Sinusnasal outcomes, Quality of life

EP-0787 [Neuro-oncology » Neuro-endocrine]

Report of Pituitary Case Operated with ETSS Approach

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Pituitary is a rare primary tumour of the neurohypophysis or infundibulum, which masquerades as a pituitary adenoma. Some researchers believe that they arise from the folliculostellate cells in the anterior lobe of the pituitary. This case report reviews the clinical, neuroimaging and histopathological features of this rare tumour in order to understand it better. This case is 42 year-old female Was referred to our center with visual field defect with left temporal prominence and hypothyroidism presenting at the clinic. In imaging documents, the pituitary gland has been reported normal in size and pattern. The radiological findings are nonspecific and do not differentiate these tumours from pituitary adenomas. T1-weighted imaging (WI) and T2WI demonstrated millimetric hypointense foci and linear signal void areas in all lesions. Consistent with the hypervascular features of the tumour. In pathology recordings from pituitary tumor biopsy, there are recordings of Pituitary versus pituitary adenoma with spindle cell features. A complicated surgery was required and it was done via endoscopic transnasal transsphenoidal approach successfully. We will engage the process of the surgery and complications with the patient in details in the article. Following images in 6 months after surgery shows no residue of tumor and No hormonal abnormality

Keywords: Pituitary, ETSS, Adenoma

EP-0788 [Neuro-oncology » Neuro-endocrine]

Pituitary Metastasis of a Lung Cancer: Case Report

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Pituitary metastasis are very rare, they are an unusual complication of systemic cancer typically seen in elderly patients with diffuse malignant disease. The primary neoplasms more commonly associated with pituitary metastasis are breast cancer in women and lung cancer in men. A 54-year-old man with lung cancer presents a pituitary metastasis revealed by diabetes insipidus associated with

diplopia. There was no visual impairment at the moment of the diagnosis. The MRI shows the involvement of the posterior lobe of the pituitary gland and the extension into the cavernous sinus. There was no anterior hormonal imbalance. The patient underwent endoscopic endonasal transsphenoidal surgery which allowed the surgeon to perform a gross total removal of the tumor. The histological exam confirmed the diagnosis. Surgical management of pituitary metastasis (visual decompression or biopsy when the diagnosis is not obvious) remains the best therapeutic option since the radiosurgery is impractical because of the proximity of the pituitary gland to the optic chiasm. The prognosis is difficult to estimate and is directly related to the primary neoplasm. The diagnosis and treatment of pituitary metastasis can be difficult to determine. Surgical decompression can improve the quality of life in patients suffering from symptomatic pituitary metastasis.

Keywords: Pituitary metastasis, Lung cancer, Endoscopic endonasal transsphenoidal surgery, Diabetes insipidus

EP-0789 [Neuro-oncology » Neuro-endocrine]

Brain Metastasis from Pancreatic Cancer: A Case Report and Literature Review

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Pancreatic cancer is a disease with a 5-year survival rate below 5%, and most patients die within 2 years of diagnosis. Given the absence of early signs or symptoms, 65–70% of patients show nodal or distant metastases to the liver, peritoneum, lungs or bone by the time of diagnosis. Metastasis to the brain is quite rare and usually predicts very poor prognosis. Although the treatment strategy tends to be palliative for advanced pancreatic cancer with brain metastasis, several reports have described aggressive surgery for brain metastasis resulting in long-term survival. A 52-year-old man had been diagnosed, six years ago; with a controlled pancreatic adenocarcinoma for which he underwent pancreatoduodenectomy. The post-operative course was uneventful. He was referred to our neurosurgical department with 20 days history of headache and vomiting. On examination he presented a left hemiparesis. Magnetic resonance imaging revealed a mass lesion comprising solid parts and multiple cysts in the right temporoparietal region. The mass demonstrated irregular ring enhancement on contrast administration and was accompanied by extensive perifocal edema. The patient underwent craniotomy with gross total resection of the tumor. Histopathological analysis revealed moderately differentiated pancreatic adenocarcinoma. He had complementary chemotherapy and radiotherapy. Evolution with a good on a decline of 6 months. In general, the prognosis for pancreatic carcinoma patients with brain metastasis is very poor. Surgical resection of brain metastasis may allow long-term survival in patients for whom the primary carcinoma is controlled.

Keywords: Brain metastasis, Pancreatic cancer, Surgery

EP-0790 [Neuro-oncology » Others]

Factors Affecting the Recurrence and Dissemination of Primary Spinal Ependymomas

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Background: The importance of surgical treatment of primary spinal ependymomas (PSEs) to prevent local recurrence, dissemination, neuro- and extraaxial metastasis. Long-term surgical outcomes showed that recurrence rate of PSEs up to 24%. To find the factors that may affect the recurrence of PSE by evaluating the long-term surgical outcomes of 46 consecutive cases.

Method: Medical records of 46 PSE cases which underwent surgery in BRSHH hospital, during a 12-year period (2004-2015) were retrospectively reviewed. The patients were divided into two groups; A: non-recurrent cases (n=41) and B: recurrent/disseminated cases (n=5).

Results: The sample consists of twenty-one female and twenty-five male patients. Recurrent three cases were females. The mean age of the recurrent group was 27.6±11. Five recurrent patients had motor deficits, three patients had long tract findings. The mean clinic course of recurrent group was 39.75±38.7 months. 1-,3- and 6-year recurrent/disseminated rates were 4.3%,6.5% and 10.9%, respectively. Recurrent cases were located in cervical (2), thoracic(1) and one patient had multi-focal. Disseminated case was located in lumbar spine. Four recurrent/disseminated PSEs were intramedullary. Exception for disseminated pediatric MPE (grade I) case which was underwent GTR, all cases were underwent STR. Three recurrent PSEs were grade II and one grade III. Two patients were presented with syrinx cavity. After recurrence one underwent GTR, two STR and one NTR.

Conclusion: Neurological deficit and/or long tract findings on presentation (P<0.0001), intramedullary ependymomas (P<0.0001), long-term clinical course (P=0.0026), and cases which underwent subtotal resection (P=0.023) are more likely to recur than other PSEs.

Keywords: Primary spinal ependymoma, Recurrence, Gross-total resection, Syringomyelia

EP-0791 [Neuro-oncology » Others]

Features of Magnetic Resonance Tractography in Diagnosis and Treatment of Intracerebral Brain Tumors

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Background: Magnetic resonance tractography (MR tractography) allows non-invasive visualization of individual white matter

functionally important pathways (FIP) throughout the brain. It enables to identify trajectory of conductive tracts (paths) of brain white matter in areas adjacent to tumor, give information about conductive fibers, their displacement, damage of their integrity or growth of tumor.

Method: 27 patients with a diagnosis of glial brain tumors in Department of Neurosurgery of I Clinic of Samarkand State Medical Institute in 2015-2016 years. Age of patients from 22 to 64 years, mean 43 years. MR tractography performed to all patients pre- and postoperatively.

Results: High-grade gliomas on MRI were presented as homogenous neoplasm of hyperintense MRI signal on T2 weighted images (WI), iso- or hypointense - on T1 WI. Perifocal edema predominantly was absent (11 patients). On giant size gliomas was observed “mass effect” in the form of displacement of midline structures in 0.6-1.2 cm (13 patients). In 15 patients was determined destruction of associative fibers in tumor infiltration area. In 7 patients with cystic component tumors short associative fibers skirted the tumor and FIP were displaced by tumor without damaging their integrity.

Conclusion: Thus, MR tractography allows to assess damage of FIPs of the brain by intracerebral tumors, the data will be used in planning adequate surgical access and determining the optimal amount of tumor removal in order to save normal FIPs.

Keywords: Tractography, High-grade gliomas, Associative fibers

EP-0792 [Neuro-oncology » Others]

Histological Predictors of Surgical Treatment Results of Mixed Gliomas

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Background: Oligoastrocytomas are a subset of brain tumors that present with an appearance of mixed glial cell origin, astrocytoma and oligodendroglioma. The current approach to treating patients with cerebral oligoastrocytomas (OA) including surgical treatment taking into account the anatomic and physiological availability. Nevertheless, it should be recognized that influence of OA histological features for the surgery of these tumors have not conclusively established.

Method: Analysis of long-term surgical treatment results in 163 patients with OA taking into account histological structure. OAI (WHO) was diagnosed in 32 patients (19.6%), OAI (WHO) - in 123 patients (75.4%). At 8 patients (5%) anaplastic OA had morphology similar to the glioblastoma. Survival was estimated within treatment histological groups using the Kaplan-Meier method.

Results: In 52 OA (32%) predominated oligodendroglial component (oOA), in 48 OA (29%) - astrocyt component (aOA), in 63 OA (39%) determined relatively even cells` distribution of both components. 34 patients (20,9%) were operated on recurrent OA. Progression-free survival (PFS) in patients with OAI was 32,36 ± 27,1 months, in patients with OAI - 17.5 ± 12.7 months. The overall survival (OS) in patients with OAI was 55 ± 12,3 months, OAI - 24 ± 6.5 months, OAI-IV - 6 ± 2,3 months, averaging 39 ± 7.4 months.

Conclusion: Long-term results after surgery significantly correlated with histological features of OA. A significant difference (p<0.05) in

OS and PFS was found between surgery results of OA histological groups. oOA has the most favorable prognosis and aOA has the most poor prognosis.

Keywords: Oligoastrocytoma, Surgical treatment, Results of surgery

EP-0793 [Neuro-oncology » Others]

Association Between Cytochrome p450 Gene (CYP2C19) Polymorphism and Glial Tumors of Central Nervous System

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Glioma is a consequence of multiple risk factors, and the interaction between environmental and genetic factors is generally accepted. Cytochrome P450 2C19 (CYP2C19), one of the clinically important CYP isoform, plays an important role in the metabolism of xenobiotics and drugs. It is possible that environmental factors and genetic polymorphisms in xenobiotic-metabolizing enzymes may contribute to the development of glioma. The aim of the present study was to investigate the association of CYP2C19 gene polymorphism in the patients with glioma. The study population consisted of 104 unrelated healthy individuals and 60 patients with glioma. Genotyping of CYP2C19*2 and CYP2C19*3 genotypes were performed using real time polymerase chain reaction with a Light Cycler instrument. There were not a mutant gene in both cases and healthy controls for the CYP2C19*2 gene. Only the CYP2C19*3 wild type genotype was detected in all the subjects of glioma and control groups. The frequencies of the CYP2C19*2 heterozygote genotype were 25% in gliomas and 17,3% in controls. The relative risk for the heterozygote CYP2C19*2 genotype was 1.6 (95% CI: 0.73–3.45) for the glioma cases compared with the controls but this risk was not statistically significant ($p>0.05$). Similarly the heterozygote CYP2C19*2 genotype was 1,3 fold risky ($p>0.05$) in high grade gliomas when compared with low grades. The present study did not reveal a significant relation between CYP gene polymorphisms and glial tumors. Further studies on larger groups are needed to determine the association of CYP2C19 polymorphism in patients with glioma.

Keywords: CYP2C19*2, CYP2C19*3, Glioma

EP-0794 [Neuro-oncology » Others]

Rarely Seen Spinal Paranglioma of Medulla Spinalis

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Spinal parangliomas are neuroendocrine tumours of the extra adrenal paranglionic system. These tumours are rarely encountered in adolescents, with the peak incidence in the fifth decade. A 54-year-old male, with the history of squamous cell

lung carcinoma and cranial metastases operation, was admitted to our clinic with lower back pain radiating to the left lower limb and causing weakness. Gadolinium enhanced magnetic resonance imaging (MRI) of lumbosacral spine revealed an intradural lesion at the L2-L3 level. The patient was operated on, laminectomy with total tumour removal was performed. Histopathological examination revealed a well-differentiated neoplasm containing “Zellballen” (clusters of granulated epithelioid cells surrounded by thin fibrovascular stroma). The aggregated chief cells were surrounded by capillaries, present throughout the lesion. There was a flattened layer of sustentacular cells which encompassed both the lobules and the “Zellballen”. Round to oval nuclei with finely granulated chromatin and prominent nucleoli occupied the centre of the cells. Binucleated cells were rare. Pyknotic nuclei and mitoses were extremely rare. Immunohistochemical testing gave a positive reaction for chromogranin in the chief cells. Spinal parangliomas are benign neoplasms. This extremely rare pathology can usually be successfully treated by total surgical resection, which is considered curative but subtotal resection often leads to recurrence. In the event of incomplete removal, long-term follow-up is mandatory. They need to be distinguished from more aggressive tumours as their prognosis is excellent.

Keywords: Paranglioma, Medulla spinalis paranglioma, Intradurale paranglioma

EP-0795 [Neuro-oncology » Others]

Frequency of Cerebellopontine Angle Epidermoid Cyst Presenting as Trigeminal Neuralgia

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Aim: To know about the frequency of Cerebellopontine angle epidermoid cyst presenting as trigeminal neuralgia.

Method: This retrospective observational study was conducted in Neurosurgical Department Lady Reading Hospital Peshawar between July 2012 to July 2016 with total four years duration. Documentation was done from hospital charts and operative notes of all those patients who presented with symptoms of trigeminal neuralgia due to epidermoid in cerebellopontine angle and operated through retromastoid craniectomy were included and operated patients with other lesions of the brain were excluded from the study. Data was analyzed by SPSS version 20 and was expressed in the form of tables and charts.

Results: Total 27 patients were included in this study in which males were 14(51.85%) while females were 13(48.15%) with male to female ratio was 1.11:1, All the patients were in the age range of 27 to 62 years with mean age 40 ± 5 SD. Right side was involved in 21 (77.8%) cases while 6(22.2%) cases were on the left side.

Conclusion: Cerebellopontine angle epidermoid cysts which present with symptoms of trigeminal neuralgia are common in middle age males with predilection to the right side

Keywords: Cerebellopontine angle, Epidermoid cyst, Trigeminal neuralgia

EP-0796 [Neuro-oncology » Others]

Glutathione S-Transferase Gene Polymorphisms and the Risk of Glioma

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Background: The etiology of glioma remains little known, and may be multifactorial resulting from the interaction of intrinsic and environmental factors. Glutathione S-transferases (GSTs) belong to a superfamily of detoxification enzymes. GSTs are involved in metabolizing a wide range of xenobiotics: environmental carcinogens, chemotherapeutic agents, and reactive oxygen species. GST gene mutations can lead to tumor formation. The aim of the present study was to investigate whether the genetic polymorphisms of GST play a role in susceptibility to glioma.

Method: The study population consisted of 104 unrelated healthy individuals and 60 patients with glioma. Genotyping of GSTM1, GSTT1 and GSTP1 genes was performed using real time polymerase chain reaction.

Results: Although they are statistically nonsignificant, GSTM1, GSTT1 and GSTP1 mutant genotype frequencies are higher in patients in comparison to the controls. We found an increased 1.13, 1.61 and 1.32 fold risk of glioma in individuals with the mutant GSTM1-null, GSTT1-null and GSTP1-Val-Val genotypes ($p > 0.05$). GSTP1-Ile-Val heterozygote genotype had a 1,2 fold risk in high grade gliomas when compared with low grade tumors ($p > 0.05$). GSTP1-Ile-Val genotype was associated with a lower risk of developing glioma (OR = 0.67; 95% CI: 0.30–1.47, $p = 0.012$).

Conclusion: There are published studies with varied results about GST gene polymorphisms in glioma among different ethnic populations. The present study suggest that GST genotypes may not play an significantly important role in glioma pathogenesis. It is important to conduct more studies with large sample size to confirm whether GST genotypes are associated with the risk of development of glioma.

Keywords: GSTT1, GSTM1, GSTP1, Glioma

EP-0797 [Neuro-oncology » Others]

Phosphorus-32 Interstitial Radiotherapy for Recurrent Craniopharyngioma: Expressions of Vascular Endothelial Growth Factor and Its Receptor-2 and Imaging Features of Tumors are Related to Tumor Radiosensitivity

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Aim: To investigate the relationship of the expression of VEGF/VEGFR-2 and imaging features with the therapeutic efficacy of Phosphorus-32 colloid interstitial radiotherapy in recurrent craniopharyngioma.

Method: 32 patients with recurrent craniopharyngioma underwent phosphorus-32 colloid interstitial radiotherapy. The tumor imaging features were classified into four types according to the thickness of the cyst wall and signals of the cyst contents

as shown by CT and MRI images. Protein expressions of VEGF and VEGFR-2 in craniopharyngioma tissues were evaluated with immunohistochemistry before radiotherapy. The tumor radiosensitivity was determined at twelve months after the interstitial radiotherapy.

Results: VEGF mainly expressed in the tumor cytoplasm, and VEGFR-2 expressed either in vascular endothelial cells or in tumor endothelial cells. VEGF/VEGFR-2 expressions varied significantly in cases sensitive or insensitive to the radiotherapy (VEGF: $p = 0.028$; VEGFR-2: $p = 0.017$). Tumor imaging features were correlated with the therapeutic efficacy of interstitial radiotherapy ($p = 0.000$). VEGF expression had no correlation with the imaging features of tumors ($p = 0.226$), but VEGFR-2 expression was correlated with the imaging features of tumors ($p = 0.008$).

Conclusion: Our results confirmed the correlation among imaging features, VEGFR-2 expressions, and tumor radiosensitivity in craniopharyngiomas. Imaging features and VEGFR-2 expressions may add useful data to the radiosensitive assessment of craniopharyngiomas.

Keywords: Craniopharyngioma, VEGF/VEGFR-2, Imaging features, Phosphorus-32 colloid interstitial radiotherapy

EP-0798 [Neuro-oncology » Others]

Rarely Seen After Brain Surgery; Mucor Infections

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Mucormycosis is a highly aggressive fungal infection caused by Zygomycetes, from the order of Mucorales. This infection commonly presents an aggressive and rapid course and typically affects immunocompromised patients. A 36-year-old female patient was operated in another hospital with a left frontal tumor around 9 years ago. Pathology was grade 3 glial tumor. She applied to our clinic with a story of seizure in 2016. She was re-operated upon detection of a recurrent frontal tumor as a result of the examinations performed. The patient's pathology has been a grade 4 glial tumor. When she had a efflux at the wound site during follow-up, the specimen was taken and pathology was sent. She receives long-lasting antiepileptic treatment and dexamethasone treatment. There is no chronic disease story. In the specimen of the patient taken from the wound site; wide necrosis areas and hyphae structures compatible with fungal microorganisms in necrotic debris were observed. Ninety degrees of branching are observed in hif constructions. These findings were thought to be compatible with mucorous infection. Wide spectrum antifungal therapy (amphotericin B) has initiated in the patient. As occurs in other forms of mucormycosis, systemic risk factors of immunosuppression contribute to the fungal infection. Underlying immunosuppression correction and a combination of radical surgical treatment and antifungal therapy are required for correct fungal infection control and to improve survival rates. In conclusion, mucormycosis is becoming an emergent disease due to the increase in immunosuppressed patients. Mucosal infections are rare after brain surgery.

Keywords: Mucor infections, Brain surgery mucor infections, Immunosuppressed mucor infections

EP-0799 [Neuro-oncology » Others]

Biocompatible Amniotic Sac Implant Produces Fresh-Like Conditions During Recurrent Glioma Surgery

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Dissection of brain surface adhesions during recurrent glioma surgery risks injury to the brain and important surface arteries and veins. We present our experience with biocompatible amniotic sac Implant To prevent post-op adhesions. Amniotic sac implants were laid on the brain surface after Resection of gliomas located in the vicinity of major surface arteries (Sylvian fissure) and major veins (Parasagittal convexity). Both cases were re-operated on for tumor recurrence. In both cases a new arachnoid like surface layer was formed. There were no dural adhesions at all. The new formed layer was easy to dissect of major surface arteries and veins. Amniotic sac implants have a promising role in preventing most surgical brain adhesions and decreases the risks of recurrent glioma surgery. It produced an impressive fresh, new case-like conditions.

Keywords: Glioma, Recurrence, Brain adhesion, Safety

EP-0800 [Neuro-oncology » Others]

Long-Term Surgical Treatment of Intracranial Epidermoid Cysts: A Retrospective Study

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Background: Intracranial epidermoid cysts (IEC) are uncommon lesions of the CNS. The CPA is the most common site of occurrence of IECs. This study presents surgical outcomes of twenty-three consecutive IECs.

Method: The patients operated between the years 2009 and 2014, for intracranial IECs at neurosurgery department in BRSHH institution. All patients underwent a craniectomy or craniotomy before neurosurgical tumor removal. The long-term clinical outcomes were evaluated retrospectively using patients age, gender, complaints, the clinical course, locations, recurrence rate and complications.

Results: Twenty-three (12 woman, 11 men) patients were operated for IECs. The mean age was 38.42±13.6 (5-59). The most common complaint was headache (78.3%). The mean clinic course was 34.3 (3-120) months. Their locations were PCA [11] (R:5, L:6), temporal [5] (R:4, L:1), midline cerebellum [3] (R:2, L:1), frontal [3] (R:2, L:1) and one female patient had diploic parietal EC. 17 patients were underwent GTR and had no recurrences at their follow-up period. 6 patients underwent STR (2women, 4 men) and all had been re-operated for recurrent lesions. Recurrence rate was 26%. Morbidity rate was 8.7% (one male and one female had hydrocephalus and were treated using VP shunts but male had multi-dysfunctions of shunt

and died with meningitis on his PO 98.month, the female is disabled PKS:50). One else male patient was died for cardiopulmonary arrest on his PO 118.month. Thus, mortality rate was 8.7%.

Conclusion: Despite that the fact epidermoid cysts are benign extracerebral intradural lesion, however, they recur unless GTR had been performed.

Keywords: Intracranial epidermoid cyst, Cerebellopontine angle, Benign intracranial cyst, GTR

EP-0801 [Neuro-oncology » Others]

Demographic and Histopathological Patterns of Neuro-Epithelial Brain Tumors in Eastern Province of Saudi Arabia

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Background: The primary objective of this study was to review the demographic and pathological pattern of neuro-epithelial brain tumors in a tertiary referral centre in the Eastern Province of Saudi Arabia. The secondary objective was to compare the results with other regional, national and international studies.

Method: This is a retrospective study, in which we reviewed all cases of primary brain tumors referred and treated in our centre between January 2010 and January 2015.

Results: Total number of cases was 149 including 96 adult cases (64.4%) and 53 pediatric cases (35.6%). Male cases were 58%, and female 42%. The age group distribution showed 2 peaks; one in the first 5 years of life and the second was in the middle age (26 to 45 years). GBM was the commonest pathological type (32%), followed by PNET/MB (13.3 %), Pilocytic astrocytoma (9.3%), Anaplastic astrocytoma (8.7%), Oligodendroglioma (8.7%), Ependymoma (7.3%), diffuse brain stem gliomas (6%), diffuse astrocytoma (4.6%).

Conclusion: The incidence of brain tumors is generally low in Saudi Arabia. However, it affects younger population according to our study. This finding is similar to other Middle Eastern countries but unlike western countries where older age groups are more affected. The pathological pattern is almost similar to other countries. There is however significant increase in high grade gliomas in Eastern Province in our study compares to a similar local historical study. This finding should however be interpreted cautiously. It might be due to selection errors or due to change in pathological grading and expertise.

Keywords: Neuroepithelial tumor, GBM, PNET, HGG, LGG

EP-0802 [Neuro-oncology » Others]

Effect of Epithelial Neutron Beams on Glial Tumor Tissues

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Background: In recent years, incidence of malignant brain tumors are increasing steadily. Development of effective adjuvant therapies,

using densely ionizing radiation is an important task, and is of great importance for practical medicine. The purpose of the research is to study the effect of epithermal neutron beams for malignant brain tumors, by radiating human tumor tissues in laboratory.

Method: The work is based on laboratory studies and observations of 26 patients with malignant tumors of the cerebral hemispheres, which were treated at the Republican Research Center of Neurosurgery, Department of Health of the Republic of Uzbekistan within 2014 - 2015. All patients underwent contrast enhanced brain MRI with "Magnevist" preoperatively, and performed microsurgical removal of tumor. During the surgery excised tumor tissue sample is taken for irradiation. The irradiation of the tumor tissue by epithermal neutrons performed in the laboratory of the Institute of Nuclear Physics, Tashkent, Uzbekistan. Then performed comparative histological analysis of irradiated and non-irradiated tissue samples.

Results: All tumors were histologically verified. Of these: anaplastic astrocytoma - 10 (38.5%) patients, oligodendroglioma - 5 (19.2%), glioblastoma - 7 (26.9%) and oligoastrocytoma - 4 (15.4%) patients. Comparative histological study of irradiated and non-irradiated tumor tissue samples revealed pallor and loss of clarity of nucleus (karyolysis) and an increase in the amount of swollen cells with areas of enlightenment and foci of necrosis around the vessels.

Conclusion: Irradiation of malignant brain tumor tissues with epithermal neutron beams is an effective adjuvant method of treatment of malignant brain tumors.

Keywords: Malignant brain tumor, Epithermal neutron beam, Adjuvant treatment

EP-0803 [Neuro-oncology » Others]

Long Awakening of Neurosurgical Patients After Infusion of Thiopental - Drug Sleep or Neurological Deficit?

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In the Department of anesthesiology and intensive care of RNHI of prof. A. L. Polenov we observed two patients after prolonged infusion of thiopental sodium for neurovegetative stabilization after SAH, intraventricular hemorrhage, complicated intravascular intervention. The duration of the infusion in both cases was 72 hours, the total dose for one patient (body mass index 35.1) was 200 mg/kg, for another (body mass index 22.5) – 300 mg/kg. In both cases, recovery of consciousness, restoring of spontaneous breathing observed in 72 hours after cessation of drug infusion. In the second case barbiturates concentration in blood was investigated in 48 hours after cessation of thiopental sodium, the result was 19 mg/L. In both cases the patients were discharged from IC in satisfactory condition.

The slow awakening of patients after prolonged infusion of sodium thiopental due to the peculiarities of its pharmacokinetics, which is linear only in case of application of small doses of the drug, the typical anesthesiology. Otherwise, there is a saturation of the enzymes involved in the metabolism of the drug, (the mechanism of the Michaelis-Menten), and the half-life period could almost double [1]. This could be more expressed in patients with obesity. In addition, there is a fuzzy relationship between

pharmacologic response and drug concentration in plasma [2]. Our observation confirms the literature data. When assessing the neurologic status of patients the pharmacokinetics of thiopental sodium and its potential prolonged impact should be taken in to account.

Keywords: Thiopental sodium, Recovery of consciousness, Prolonged sedation

EP-0804 [Neuro-oncology » Others]

Melanocytoma in the Quadrigeminal System

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Primary melanocytoma are rarely seen in the central nervous system. Central nervous system melanocytomas arise from leptomeningeal melanocytes, embryologically called neural crest cells. Melanocytoma histologically benign tumors. The goal of the treatment is to remove the tumor totally. A 43-year old woman presented with headache and nausea. The patient's neurological examination was normal. On the MRI of the patient, approximately 22x23 mm in size extending toward the quadrigeminal cistern and isointens on T1A, a well-circumscribed mass lesion was observed after IVCM. Meningioma was considered as a preliminary diagnosis. The patient was surgically treated by a posterior fossa craniotomy. Pathologic diagnosis was reported as intermediate grade melanocytoma. Melanocytoma are slow-growing, benign tumors. Intracranial melanocytoma usually produce signs and symptoms of an expanding mass in the posterior fossa, sometimes compounded by obstructive hydrocephalus and cerebellar dysfunction. Radiologically, melanocytoma may resemble meningiomas. The goal of the treatment is to remove the tumor totally.

Keywords: Melanocytoma, Meningioma, Posterior fossa

EP-0805 [Neuro-oncology » Others]

Dynamics of Some Characteristics of Homeostasis in Neurosurgical Patients

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Background: In neurosurgery the concept of adequacy of anesthesia is widely interpreted. Inflammation is both pathological and adaptive process caused by the protective mechanisms reactions of the organism to local injury.

Method: We evaluated 65 patients with mean age 50.5 ± 5.2 years. All patients undergo posterior fossa tumor resection. Surgeries were conducted under conditions of neuro-vegetative stabilization using opioid analgesics and α -2 adrenergic agonist. Laboratory tests included: analysis cytokines levels (IL-8, IL-6, IL-10, TNF). Blood sampling analysis was carried out in 5 steps: one day before surgery, before induction anesthesia, after induction anesthesia, after tumor resection (stage of hemostasis) and on the first day after surgery.

These steps were chosen to assess the impact of various perioperative factors on neuro-humoral indicators of adaptive responses.

Results: Generally the biochemical parameters remained relatively stable during the whole perioperative period. While analyzing cytokines levels was marked a considerable increase of IL-10 on the stage of hemostasis, but with the increase of IL-6 on the next day after surgery.

Conclusion: Changes in systematic inflammatory response as the reaction to brain surgery were transient. There were no correlations between different homeostasis characteristics and frequency of post-operative complications. Within condition of neurovegetative stabilization using fentanyl, clonidine and propofol with anesthesia adequacy support was marked considerable immune response to the surgical stress.

Keywords: Neurovegetative stabilization, Posterior fossa tumor, Systemic inflammatory response

EP-0806 [Neuro-oncology » Others]

Lipoma of the Brain Convexity

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Intracranial lipomas are rare entities and considered as congenital malformations. Mostly they are found in the midline structures of the brain while convexity lipomas are rare. Intracranial lipomas are usually asymptomatic however the most frequent symptoms are found to be headaches and seizures. A 32 year old woman presented with seizure admitted to hospital; secondary generalized seizure was resistant to anti-epileptic therapy. Computed tomography showed fat density with peripheral calcifications on the right side on the parietal convexity and on magnetic resonance imaging high T1 and T2 signal without contrast enhancement was seen. Surgical removal of the lipoma was performed and pathology was found as lipoma accompanied with fat necrosis. Convexity lipomas are uncommon for intracranial lipomas; if it is presented with seizures resistant to medical therapy surgery should be considered.

Keywords: Lipoma, Convexity, Brain

EP-0807 [Neuro-oncology » Others]

Seeding of Ependymoma Seven Years After Initial Diagnosis

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Cranial ependymomas are the 3rd most common brain tumors of childhood and are usually diagnosed in adults. Total resection is the preferred treatment modality since residual volume is the most determinant prognostic factor. Postoperative radiotherapy

may be employed for high grade lesions while its role in low grade lesions is still controversial. A 52 year old female patient applied to our clinic with lower back pain radiation to her left leg. She had a history of cerebellar vermian tumor removal 7 years ago which was reported as Ependymoma Grade 2. Postoperatively she had received of radiotherapy. At the time of the surgery the CSF cytological analysis had not revealed any pathological findings. Until recently she had no additional symptoms. A lumbar MRI was ordered for her current symptom and upon examination her MRI revealed an intradural extramedullary contrast enhancing lesion measuring approximately 27*11mm at the L4-5 level. There was no major finding in her neurological examination besides a minor motor weakness. A soft, purplish lesion was observed in between the rootlets and was excised totally after dissection. Her pathological examination revealed a WHO Grade 2 ependymoma. Even though they face the ventricle cavity and are in contact with CSF, seeding is uncommon when compared to medulloblastomas. CSF detection after intracranial lesion removal occurs on average 7 years after the initial surgery. Thus although annual spinal scanning may be a bit unnecessary, spinal MRI every 2-3 years would be advised. Postoperative radiotherapy is also recommended for local control.

Keywords: Ependymoma, Seeding metastase, Seeding medulla spinalis

EP-0808 [Neuro-oncology » Others]

Unilateral Exophthalmos Revealing a Fibrous Dysplasia of Bone: A Case Report and Review of Literature

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Fibrous dysplasia of bone is a benign congenital fibro-osseous disease, where normal bone is replaced by an immature tissue. It can be revealed by multiple manifestations such as the ophthalmologic ones. We present the medical history of an 11-year-old girl with craniofacial fibrous dysplasia revealed by unilateral exophthalmos and we propose to study through a review of literature the epidemiological, clinical and radiological features of this disease.

Keywords: Child, Fibrous dysplasia of bone, Exophthalmos, Osteosarcoma

EP-0809 [Neuro-oncology » Others]

Choroid Plexus Carcinoma

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Choroid plexus tumor which consist of the neuroepithelium of the choroid plexus is the unique brain tumor. Choroid plexus carcinoma is a rare tumor of the central nervous system. Choroid plexus carcinoma found in the pediatric population. Choroid plexus carcinoma often located the fourth ventricle in adults. 63 year old male who was admitted to the hospital with vertigo, hearing loss and loss of balance. Computed tomography (CT) scans of the

brain showed the inferior level of the fourth ventricle, 17x17 mm in size. Calcifications are suspicious cystic lesions containing around. Magnetic resonance (MRI) scans of the brain showed cerebellar vermis inferiorly 16 mm in diameter in the hypointense T2-hyperintense in FLAIR-weighted sections hypointense cystic lesion that keep the contrast after the IVKM. The cystic lesion was narrow of the foramen inferior segment of the fourth ventricle and magendie. Also, they viewed as slightly lateral ventricle; however, Evans index 0.30. After that, operation was performed. Histological examination revealed a highly cellular, focally necrotic tumor composed of frequent mitoses, malignant epithelial tumor showing papillary regression. Choroid plexus carcinomas is a malignant type of choroid plexus papillomas. Complete removal of the tumor, adjuvant radiotherapy and chemotherapy should be applied.

Keywords: Choroid plexus carcinomas, Choroid plexus papilloma, Neuroepithelium

EP-0810 [Neuro-oncology » Others]

Cystic Cortical Ependymoma in an Adult: Case Report and Review of the Literature

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Cortical ependymoma is a rare primary brain tumor in adults. One third of ependymomas are supratentorial tumors. Supratentorial cortical ependymomas (CE) are relatively less common tumor with a few reported cases in the literatures (49 cases). We report a 30-year-old male with sensory-type seizures who was found to have a right posterior frontal cortical lesion with large cystic component. The lesion was resected completely and pathological examination revealed anaplastic ependymoma WHO grade III. The pathogenesis of the extraventricular ependymomas remains uncertain but there are different suggested theories. The classic clinical presentation of CE as most superficial neocortical lesions are seizures and focal neurological deficits. Surgical resection is the management of choice for grade II and III. In case of malignant ependymoma, whole brain irradiation with additional local fractions is recommended by many authors. Cortical ependymomas appear to have a relatively favorable prognosis with a low recurrences rate in comparison to intraventricular type.

Keywords: Cortical ependymoma, Extra-ventricular, Cystic ependymoma

EP-0811 [Neuro-oncology » Others]

Radiation-Induced Meningiomas: A Serial of Three Consecutive Patients

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Background: Radiation-induced meningioma (RIM) is the most common brain neoplasm known to be caused by ionizing radiation. This study describes three consecutive RIM cases that occurred after radiotherapy treatment.

Method: The patients operated between the years 2009 and 2014, for RIMs at neurosurgery department in BRSHH institution. After craniotomy performed using high speed drills under microscope to reach the lesion. In all cases tumors were removed totally.

Results: Three (1 woman, 2 men) patients presented with RIM. The mean age was 40±9.2 (32-50). The most common complaint was headache (100%). The clinic course was less than 3 months. All patients had alopecia and thin scalp skin. The mean age of the appearance of the first malignancy was 21±15.6 (11-39). The mean latency period was 19.2±7.4 (11-25.5) years. The first malignancies were 13-female (desmoplastic medulloblastoma, 65Gy), 11-male (desmoplastic medulloblastoma, 54Gy) and 39-male (oligodendroglioma-II, 30Gy). The histopathological examinations were revealed on (fibroblastic-grade I, Ki-67 was 2-3%, 25.5 years, CPA), (atypical meningioma-grade II, ki-67 was 8%, 21 years, right frontal) and (transitional-grade I, ki-67 was 3-4%, 11 years, right frontal), respectively. The mean follow-up period was 42±44.4 (1-89) months. One patient had rhinorrhea, then got meningitis and as the result he was lost on PO 31th day. Two patients were experienced CSF fistula. Both of them were treated with plastic surgeons.

Conclusion: Exposure to ionizing radiation has been shown to increase the risk of meningioma significantly. Despite the fact that almost RIMs are low grade, they have high risk to recurrence. Close follow-up would minimize the morbidity of RIMs.

Keywords: Desmoplastic medulloblastoma, Oligodendroglioma WHO grade II, Radiation-induced meningioma, Radiotherapy

EP-0812 [Neuro-oncology » Others]

Pediatric Ependymomas: A Retrospective Study of 60 Cases

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Background: Ependymoma, the third most common pediatric brain tumor, is a central nervous system malignancy originating from the walls of the ventricular system. The authors report their experience in the clinical and histological findings of the pediatric ependymoma.

Method: Retrospective study of the histologically proven cases of ependymoma, diagnosed between 1990 and 2016. Clinical data were reviewed for each patient and the following parameters were evaluated: gender, age at diagnosis, initial clinical symptoms and site of onset, main imaging findings and histological features.

Results: During this period, a total of 160 patients with histologically proven ependymoma were investigated, 60 among them had a pediatric age. The gender ratio was 0.66 for a male predominance (40 males and 20 females). The average age was 8.3 years (range from 7 months to 16 years). Clinical manifestations were associated to a symptomatic hydrocephalus and included headache, seizures, ataxia and sensory deficit. Tumors were supratentorial in 40% of the cases (n=15), infratentorial in 70% of the cases (n=42) and spinal in

3 cases. Histologically, there were 14 myxopapillary ependymomas, 5 anaplastic ependymomas, 2 clear cell ependymomas and 39 of the common subtype. Surgical resection followed by radiation therapy has been indicated for high grade tumors. Recurrence was observed in 4 cases.

Conclusion: Management of pediatric ependymomas has seen considerable changes over the last two decades, leading to a significant improvement in outcomes. However, the diagnosis and treatment is still a real challenge.

Keywords: Pediatric ependymoma, Pathology, Childhood brain tumor, Central nervous system cancer

EP-0813 [Neuro-oncology » Others]

Assessing Intracranial Meningioma Outcome by Simple Tumor Localization Scale

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Background: Extracerebral primary tumors such as intracranial meningioma generate from arachnoid cup cells of the leptomeninges. Although the overwhelming majority of these tumors may be successfully surgically resected, the outcome still remains unequivocally reliant on the extent of surgical resection (Simpson Grading), as well as the tumor location. The aim of this paper was to evaluate the value of the proposed tumor simple localization scale in the assessment of intracranial meningioma surgical outcome.

Method: A series of 243 single-institution patients operated on due to intracranial meningioma was analyzed in a cross-section study. Depending of tumor intracranial location, the patients were divided into the group with medial and the group with lateral tumor position. Karnofsky Performance Scale (KPS) was employed as the outcome measure at hospital discharge, while Glasgow Outcome Scale (GOS) was used at one year follow-up. A correlation between tumor location and surgical outcome was statistically analyzed.

Results: Statistically significant correlation was recorded between tumor location and both measures of outcome, respectively ($p < 0.001$).

Conclusion: Considering the results of this paper, simple localization scale dividing tumors into medial and lateral position within cranial cavity may be proposed as a prognostic tool for intracranial meningioma. Accordingly, lateral tumor position may be more favorable in comparison to medial location which is less encouraging due to the closeness of important neurovascular structures. More study is necessary to verify our findings.

Keywords: Intracranial meningioma, Localization scale, Outcome

EP-0814 [Neuro-oncology » Others]

Embryonal Tumor with Abundant Neutrophil and True Rosettes: A Case Report

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Embryonal tumor with abundant neuropil and true rosettes (ETANTR) is a rare subtype of primitive neuroectodermal tumors and one of the most aggressive brain tumors seen in children. Approximately 80 cases of this rare and malignant pediatric embryonal brain tumor have been reported to date. Usually very young children are affected and a slight female predominance is observed. A 2 year old boy presented with right sided hemiparesis for 1 week. The patient had no family history. The neurological examination has shown to the patient has 3/5 rate of motor deficit on right upper and lower limbs. General examinations revealed no triat. MRI exhibited in the left half of the pons posteriorly, the superior cerebellar peduncle was observed and in the supraordinate a smoothly confined mass lesion was observed extending to the mesencephalon. The mass caused ventricular compression of the fourth ventricle. Significant parenchymal contrast enhancement has not been distinguished in the post-contrast series. The patient underwent surgery with subtotal tumour resection and ventriculoperitoneal shunting. Patient received intensive care after surgery. The patient died 15 days after the operation due to pneumonia. The pathology diagnosed the lesions as ETANTR. ETANTRs are a group of rare tumors usually found in the supratentorial region in young children. Treatment of this tumor includes resection, chemotherapy, and radiotherapy in most cases, although even with appropriate treatment the prognosis is poor.

Keywords: Embryonal tumor, Posterior fossa, True rosettes

EP-0815 [Neuro-oncology » Others]

Rarely Seen Brain Fungal Abscess that Distinguish from Brain Tumors

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Fungal brain abscesses are rare and have a high morbidity and mortality rate. As this case reports, even in immunocompetent patients, clinical suspicion along with detailed history and experienced radiological interpretation can lead to a diagnosis. A 56 years old female patient was applied to us for lateral gaze palsy. She had been treated with amphotericin B and flucytosin for fungal brain abscess, first was 30 years ago and second was 22 years ago. She was diagnosed with fungal abscess of brainstem in neuroradiological evaluations. Biopsy wasn't performed due to the localization and refusal of consent. Amphotericin-B and fluconazole was started. Her lateral gaze palsy improved on the second week of antifungal treatment. After 9 weeks of antifungal therapy she was discharged with close follow up recommendation. Central nervous system fungal infections remain difficult to diagnose. Especially, when the biopsy nearly impossible, imaging studies become crucial. In the literature, immunocompetition is important, but not necessarily for brain fungal abscess. We report emphasizes that physicians have to

consider fungal infections in the differential diagnosis of the brain lesions independently from the immune status of the patients.

Keywords: Fungal infections, Brain fungal abscess, Resistant brain fungal abscess

EP-0816 [Neuro-oncology » Others]

Sphenoidal Sinus Aspergillotic Mucocele: A Case Report and Review of Literature

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Sinusal aspergillosis is a serious infection; the isolated sphenoidal sinus infection is due to its posterior location. It has a particular potential of spreading to the neuro-meningeal and orbital structures. This is a report of a patient 44 years of age, who presented with persistent headaches for one year. Her past medical history included atopic reactions. She was also operated in 2008 de to nasal polyps. Clinical examination was normal. Brain MRI showed a lesion occupying the sphenoidal sinus extending to the posterior ethmoidal cellules. The patient was operated by a trans-sphenoidal endoscopic approach, with the opening of the anterior sphenoidal sinus wall facilitated the evacuation of yellowish thick liquid. Histopathologic studies showed the presence of mycelium filaments which was in consistent with a mycotic infection evoking diagnosis of sphenoidal sinus aspergillosis. The mucocele is an expansive pseudo-cystic formation, with slow progression which develops in the centre of the sphenoidal sinus cavity. Sphenoidal sinus location is exceptional, in fact the aspergillus spores habitually colonise the proximal paranasal sinuses (maxillary, ethmoidal and frontal). Numerous factors can be associated to the constitution of a mucocele, most frequently is traumatic and surgical, inflammatory factors have also been reported. The principle differential diagnosis posed includes bacterial sinusitis, granulomatous inflammatory lesions, sphenoidal tumors and sellar tumors developing in the infra-sellar region. Surgical marsupialisation by endoscopic endonasal approach permits the collapse of the mucocele where sphenoidotomy permits the drainage of purulent liquid of which are found the characteristic aspergillus masses.

Keywords: Mucocele, Sphenoidal sinus, Aspergillosis, Endoscopic approach

EP-0817 [Neuro-oncology » Others]

Isolated Orbital Mass Associated with Thyroid Carcinoma. Case Report

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Orbital tumors are rare tumors that can originate from all the orbital structures. Metastatic orbital masses constitute less than 5% of orbital tumors. Symptoms and clinical signs caused by orbital tumors vary depending on the localization and size of the tumor. We aimed to present this symptomatic ocular region due to the presence of metastatic tumor before the diagnosis of thyroid cancer. The 68-year-old woman presented with complaints of pain, redness and visual loss in her right eye, which was present for six months. Restricted movement in all directions with proptosis in the right

eye was observed in the examination. In cranial MRI; An orbital mass which destructed sphenoid bone and posterior-lateral wall of the right orbita and caused medial displacement of the right lateral rectus muscle and homogeneous contrast enhancement was observed. The mass was 3x3x4.5cm. The mass was removed subtotal. Histopathologic examination reported as thyroid follicular Ca. The most common metastatic cancers in the orbit are breast, prostate, and lung cancer, which metastasize by hematogenous pathways. A metastatic lesion due to thyroid cancer in the orbital fossa is a very rare localization. Patients with orbital metastases have poor prognosis. The clinical status of the patients depends on the type of primary tumor, the rate of progression and the immunological status of the patient. Radiotherapy is the preferred method for the treatment of orbital masses. However surgical excision can be performed in selected cases. Orbital metastasis treatment is aimed at protecting the symptoms of vision and increasing the quality of life.

Keywords: Orbit, Thyroid ca, Metastasis

EP-0818 [Neuro-oncology » Others]

Significance of Human Cytomegalovirus Virus (HCMV) in the Pathogenesis of Human Brain Gliomas of Different Anaplasia Grades

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Oncomodelling role of HCMV in the pathogenesis of anaplastic brain gliomas have been established. 102 patient with different anaplasia grades of brain gliomas. HCMV was evaluated by means of indirect reaction of immunofluorescence (RIIF) in cells of glioblastomas 86% patients and 69,5% patients with gliomas of low level of anaplasia. A comparison of some immunological parameters in patients with the presence or absence of tumor HCMV cells installed informative indicator of the percentage of peripheral blood lymphocytes, which significantly decreased with increasing degree of malignancy of glioma. However, in rare cases, if patients with glioblastomas in the preoperative period the content of lymphocytes in the peripheral blood exceeded 28%, it marked a long-term remission. In the presence of cytomegalovirus in tumor tissue were detected more significant inhibition of the proliferation of blood lymphocytes to FGA, than in the absence HCMV ($21, 2 \pm 2.5\%$ vs. $32.4 \pm 3.5\%$), which may indicate suppression of T-cellular immunity during viral infection. We consider staging of the interaction of the virus HCMV and glial tumors: long latent persistence HCMV at first activates antiviral immunity, has anti-tumor activity, which is accompanied by lymphocytosis and is often seen with benign gliomas. Induction of viral antigens and proteins polarization of macrophage in M2-phenotype and production of suppressor factors that suppress the immune response that observed in anaplastic gliomas. Activation of receptors on tumor cells by antigen viruses, inducing signaling pathways that stimulate the growth and proliferation of tumor cells, which is characteristic of most malignant gliomas.

Keywords: Gliomas, HCMV, Lymphocytes

EP-0819 [Neuro-oncology » Others]**The Effect of Oleocanthal on Apoptosis and Oxidative Stress of the Neuroblastoma Cell**

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Background: Neuroblastoma accounts for %15 of all children's age tumoral mortality causes. Apoptosis is an important mechanism in neuroblastoma as is in many other tumors and many researches were published implying it. The aim of this study is to show the effects of oleocanthal on in vitro neuroblastoma cells.

Method: Cells were divided in two groups. Group1: the neuroblastoma cells treated with oleocanthal. Group2: Neuronal stem cells treated with oleocanthal. The effects on cell viability, oxidative stress, neuritis inhibition and apoptosis of oleocanthal at dose of IC50 were studied.

Results: In MTT analysis, used for detecting cell viability, in Group1 the cells were less viable compared with Group2, and the difference was statistically significant($p < 0,001$). In group 1, the rates of I-NOS and E-NOS stains used for analysis of oxidative stress were greater than group 2, and the difference was statistically significant($p < 0,005$). In neurotoxicity screening test analysis used for neuritis inhibition, it was shown that oleocanthal apparently inhibited neuritis growing in neuroblastoma cells, while in bone marrow derived neurons it was less inhibitive, and the difference was statistically significant($p < 0,001$). TUNEL stain to determine cell apoptosis in Group 1 was greater than Group 2 and also the difference was statistically significant($p < 0,005$).

Conclusion: The effects of oleocanthal was showed out in vitro on neuroblastoma cells. The apoptotic effect of oleocanthal on neuroblastoma cells was detected and shown by TUNEL assay, and it is considered to be a potential monotherapy or combined therapy with other cytotoxic medicine used in oleocanthal based chemotherapies in the future.

Keywords: Oleocanthal, Neuroblastoma, Apoptosis

EP-0820 [Neuro-oncology » Others]**Brain Metastasis in Wilms' Tumor: A Case Report**

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In children with solid tumors, brain metastasis is relatively uncommon, accounting for only 0.5-1.8% of all pediatric craniocerebral tumors. Wilms' tumor is the most common abdominal tumor of childhood, and its cerebral metastasis is apparently very rare. We report the case of a 10-year-old boy underwent left nephrectomy for Wilms' tumor with pulmonary and hepatic metastasis. Treatment after complete resection of the tumor included chemotherapy and radiotherapy. He was referred to our Neurosurgery department six months after initial diagnosis. He complained of frontal headache of increasing severity associated with weightiness in the left hemibody. On

admission, his state of consciousness was found to be decreased and he had a left hemiplegia. A cranial computed tomography scan and a cerebral MRI were performed immediately showed an isodense mass in the right frontoparietal region with very little edema. After an intravenous injection of contrast medium there was marked homogenous enhancement of the lesion. A subsequent craniotomy was performed with removal of the neoplasm. Histopathological examination confirmed that it was a metastatic Wilms' tumor. After the operation, the patient was treated with radiotherapy directed to the whole brain, and additional courses of chemotherapy were given. On a follow up examination 3 month later, the patient remained clinically stable.

Keywords: Wilms' tumor, Brain metastasis, Children, Surgery

EP-0821 [Neuro-oncology » Others]**Intra-Orbital Schwannoma: A Case Report and Literature Review**

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Intra-orbital tumors include tumors from the meningeal sheaths and the nerves; which include sphenoidal meningiomas, optic nerve sheath meningiomas, schwannomas and neurofibromas. Orbital schwannomas represent 1-5% of intra-orbital tumors. We present a case of a patient aged 54 years who presented with non-dolorous, axial, non-inflamed exophthalmia of the left eye, which developed progressively for 10 years, without affecting the visual acuity. Orbito-cerebro MRI showed an intra-orbital, intra-conic tumor whose aspect gave a suspicion of cavernous angioma. The patient was operated by a fronto-orbital excision with a good post-operative results. The histopathology results were in favour of a benign intra-orbital schwannoma. The orbital schwannoma is a nervous, rare, benign tumor of the intra-orbital nerves developing from their schwann sheaths. The schwannomas develop more frequently from the intra-orbital sensory nerves especially the supra-orbital branches and supra-trochlear branches of the frontal nerves; the infra-orbital nerves, nasociliary or lacrimal nerves can also be affected. Even more rarely the schwannomas originate from the oculomotor nerves. The schwannoma is most frequently isolated, all the time; its appearance in the cadre of neurofibromatosis type II is possible. The final diagnosis is anatomopathologic, however may be made from imagery finding which include a heterogenous tumor sometimes mistaken for a cavernous angioma. Orbital schwannoma is a rare tumor, of good prognosis but which the diagnosis is frequently delayed due to slow progression, the definitive diagnosis rests from histo-pathology

Keywords: Orbital schwannoma, Exophthalmia, Visual acuity

EP-0822 [Neuro-oncology » Others]**Intramedullary Metastasis to the Cervical Spinal Cord from Malignant Pleural Mesothelioma. Case Report, Review of the Literature**

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Malignant mesothelioma is an aggressive tumor; median survival

of patients following diagnosis is 12 months. Haematogenous spreading may occur in the late stages of the disease. Tumor extension into the spinal cord via perineural spread is very uncommon for malignant mesothelioma although it is more commonly seen with other types of carcinoma. The authors report an intramedullary hematogenous metastasis to the cervical spinal cord from malignant mesothelioma, with review of the literature. A 68-year-old man was admitted to our Department because of a slowly progressive mild weakness of both low extremities, more pronounced on the left side. The patient has been treated for a malignant mesothelioma with left thoracotomy and resection of the left apical mesothelioma. Subsequently underwent radiotherapy. MRI of the cervical-thoracic spine revealed a contrast enhancing intramedullary expansive lesion of the left half of the spinal cord at the C6-C7 level. Patient underwent surgical treatment through a C6-C7 laminectomy. Through a median posterior spinal cord incision an intramedullary grayish lesion was completely removed. The paraparesis progressively improved and twenty days after surgery the patient had regained normal lower extremity function. Malignant mesothelioma can spread to the spinal canal by direct extension through the intervertebral foramina, by haematogenous spread to the spinal meninges, and by perineural growth along a single nerve root. In this case the authors present an intramedullary cervical spinal cord metastasis from malignant mesothelioma by haematogenous spread.

Keywords: Cervical spinal cord, Intramedullary metastasis, Malignant mesothelioma, Surgery

EP-0823 [Neuro-oncology » Others]

Non-Motoric Facial Nerve Dysfunction After Vestibular Schwannoma Surgery

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Background: Motoric facial nerve dysfunction is a known possible postoperative complication of vestibular schwannoma surgery. In this study, we are systematically analyzing the clinical aspects of the postoperative non-motoric facial nerve dysfunction after resection of vestibular schwannoma.

Method: prospective analysis of twenty patients. The taste functions were examined using taste strips. The patients are required to identify the modality and the intensity and compare it to the healthy side. The lacrimation function was tested with Schirmer's test. Furthermore, the patients were asked to report if they have abnormal taste sensation or disturbance in lacrimation.

Results: The taste test was abnormal in one patient. Two patients reported about subjective changes in the taste (metallic taste). There was no significant correlation between the disturbance in the taste function and the degree of motoric facial nerve dysfunction. Six patients reported about disturbances in lacrimation. This symptom was significantly correlated to the motoric facial nerve dysfunction. One patient developed crocodile tear four months after surgery in spite of normal postoperative motoric facial nerve function.

Conclusion: the taste function of the facial nerve is rarely affected even in cases of early postoperative profound facial nerve palsy. The

disturbed lacrimation is a more common symptom which is related to the degree of motoric facial nerve dysfunction. The patients should be informed about this possible complication.

Keywords: Vestibular schwannoma, Microsurgery, Outcome, Facial nerve

EP-0824 [Neuro-oncology » Others]

Diagnostic Yield and Accuracy in Frame-Based Stereotactic Needle Biopsy without Intraoperative Neuropathological Verification

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Aim: To assess diagnostic yield and accuracy of stereotactic needle biopsy without intraoperative neuropathological examination, as verified with histological study after tumor resection.

Method: Prospective collected patients who underwent frame-based stereotactic biopsy between 2013 and 2015. Of 93 biopsies, 22 underwent open tumor resection, and final histological diagnosis was obtained. Multiple biopsy samples were taken from 2-4 sites within the tumor with side-cutting biopsy cannula. Tissue was inspected macroscopically by the surgeon without neuropathological intraoperative assessment.

Results: A positive diagnosis was established in 20 cases (90.9%). One biopsy revealed no neoplastic but necrotic tissue related to the central tumor necrosis on MRI (4.5%), and another one revealed gliosis. Histological diagnosis showed GBM in 8 cases, grade III in 3, grade II in 9, DNET in 1, necrosis in 1, and gliosis in 1. Final histological diagnoses in these patients, based on openly resected tumor tissue, confirmed GBM diagnosis in all 8 cases, grade III glioma in 2 of 3, grade II in 5 of 9, and DNET in 1 case. GBM was diagnosed in 1 case, previously assessed as grade III, grade III in 3 cases, previously diagnosed as grade II and GBM in 1 case diagnosed as grade II. In 2 patients with necrosis/gliosis, final diagnosis was GBM.

Conclusion: The described biopsy technique proved to have high diagnostic yield with excellent safety profile. Lack of intraoperative neuropathological examination did not negatively influence diagnostic accuracy of stereotactic biopsy

Keywords: Biopsy, Samples, Cannula, Diagnosis

EP-0825 [Neuro-oncology » Others]

Cerebral Atypical Meningioma Metastasized to Deltoid Muscle

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Meningiomas are relatively common primary intracranial tumors that arise within the leptomeninges or dura mater. Its frequency accounts for 13-26% of all primary intracranial tumors. The incidence of meningioma metastasis was 0.15%-0.76% of all meningiomas. Metastatic lesions were located in the lung (37.2%), bones (16.55%, intraspinal (15.2%), liver (9.2%), pleura (5.5%), cervical soft tissue (4.9%), kidney (1.8%), muscle (1.8%). Cerebrospinal fluid, blood and lymphatic drainage are pathway of metastasis. 54.8% of the metastatic meningiomas originated from benign or intermediary meningiomas. Grade 1 (meningothelial, psammomatous, secretory, fibroblastic, angiomatous, transitional, microcystic, metaplastic), Grade 2 (atypical, clear-cell, chordoid) and Grade 3 meningiomas (papillary, rhabdoid, anaplastic) are more likely metastasis. 65-year-old woman was first operated multiple lesion of meningiomas in 2006. After this time 4 more operation was made. She had chemotherapy and radiotherapy treatment. She had generalized seizures under antiepileptic drugs every day. She was bed ridden, and 4 extremities muscle contractions. She was confused, and rarely glossolalia. The patient's family completed a mobile soft tissue lump on her right side of shoulder. Because of bad Karnofsky performance status scale, a true cut biopsy was made. Atypical (WHO grade 2) meningioma was seen. The patient sent to department of oncology further adjuvant treatments. Distant metastases in meningiomas occurred predominantly with previously operated tumors. 56.2% of reported distant metastasis of meningiomas originated from benign and intermediary tumors.

Keywords: Meningioma, Atypical, Metastasis, Tumour

EP-0826 [Neuro-oncology » Others]

Treatment of Colloid Cyst of the Third Ventricle Through Cystoperitoneal Shunt Only – Case Presentation

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The common treatment of the colloid cyst is surgical either through transcortical or transcallosal approach or through an endoscopic approach. We are presenting a case of colloid cyst in a young female that was treated totally with a cystoperitoneal shunt only. As the patient has been planned for VP-shunt for her obstructive hydrocephalus which was secondary to the colloid cyst, incidentally during ventricular catheter insertion into the anterior horn of the lateral ventricle, the tip went into the colloid cyst and after draining CSF first it started to drain yellowish material which has been proved histopathologically as a colloid cyst content. Follow up CT and MRI brain revealed total disappearance of the cyst. And the patient upon regular follow up showed intact neurological exam without any focal neurological deficit or symptoms of increased ICP with functioning shunt valve.

Keywords: Colloid cyst, Cystoperitoneal shunt, Treatment

EP-0827 [Neuro-oncology » Others]

The Feasibility of Electromagnetic Navigation During Surgery in the Semi-Sitting Position: Early Experience

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Background: In this study, we are evaluating the accuracy, advantages, and shortcomings of the electromagnetic navigation.

Method: 10 cases were operated in the semi sitting position under electromagnetic navigation. The head of the patient was fixed with non-metal head fixator. The field generator was placed close to head directing the magnetic field to the surgical field. The localized placed on the head fixator. The preoperative MRI and CT scan were transferred to the navigator. Registration was performed based on the CT scan. The MRI was fused after that to the registered CT scan.

Results: The registration process was obviously faster than the conventional optic navigation. The initial results showed good accuracy of the electromagnetic navigation with very good correspondence to the anatomical landmarks in the surgical field. However, metallic instruments and the cables of the electrophysiology caused interference with the signals and accordingly decreased accuracy. This required better placing of the cables. The electromagnetic field could cause interference with recording of the auditory evoked potentials but had no effect on the recording of SEP and MEP.

Conclusion: The electromagnetic navigation is an accurate system. It could be however demanding regarding the setup, but it takes the benefit of not using an optic system like the conventional navigation and it is, accordingly, helpful during surgery in the semi sitting position. Electrophysiological monitoring is possible.

Keywords: Electromagnetic navigation, Skull base, Semi sitting position

EP-0828 [Neuro-oncology » Others]

Structural and Temporal Comparison of Glioblastomas in Patients of Different Age Groups

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Aim: To examine clinico-pathologic peculiarities the different aging groups patients with glioblastomas (Gl).

Method: 560 treated with Gl at the age from 21 to 75 and over were studied (01.1994-01.1998) - 156 cases (I group), 2012 - 136 (II group), 2015 - 138 cases (III group), 2016 - 133 (IV group). Age distribution was as follows: 1 - (patients till 40), 2 group (patients from 41 to 50), 3 group (from 61-75).

Results: It was found that the number of operated patients with primary glioblastomas increased during periods of spring and autumn to 1.5 - 2 times trend continued for all 4 groups. Gliosarcomas (GS) observed in patients primarily in the spring for all 4 groups. Specific GS weight of all Gl ranged from 7.5 to 12% (I - 9,6%, II - 10,4%, III - 12,5%, IV - 7,5%). The main histopathologic changes at Gl are: pleomorphism of tumor cells, the necroses of various size, sections of blood infussion into the tissue of the tumor, mitoses, highly angiogenic tumors. Necrotic areas are common to all with 1 - 3 groups, but at length grew to the age of the patient as well as polymorphism of tumor cells and the risk of bleeding into the tumor.

Conclusion: The analysis of the dynamics of patients with GL shows a significant increase of this disease for the group of 40-60

years. Manifestation of patients with GI depended not only on the age of the patient, but also on the season.

Keywords: Glioblastomas, Gliosarcomas, Age, Season

EP-0829 [Neuro-oncology » Others]

Trigeminal Neuralgia due to Acoustic Schwannoma

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Trigeminal neuralgia (TN) is a sudden, burning, stabbing, and severe pain that occurs in lightning like form on one or more branches of the fifth cranial nerve. The pain can occur spontaneously but is often triggered by stimuli such as chewing, brushing the teeth, washing the face and laughing. TN may occur for idiopathic or due to secondary causes. Sekonder causes include trauma, infection, multiple sclerosis, tumor and vascular causes. In this article, we present a case of TN due to acoustic schwannoma. 53-year-old male patient admitted to our outpatient clinic with complaints of pain on the right half of his face, especially on his chin and cheek. The patient's pain; sudden, lightning-like, repeated several times running pain during the day and especially triggered by eating and talking. Preliminary diagnosis of TN with an initial treatment of carbamazepine 200 mg twice a day. A mass of 2.6x2.2x1.8 cm with marked contrast enhancement in the right cerebellopontine angle was reported as acoustic schwannoma on contrast-enhanced cranial MRI. The patient was referred to the gamma knife treatment with the advice of the neurosurgeon. TN is often idiopathic but can also be seen with secondary causes such as vertebrobasilar dolichoectasy, multilevel sclerosis, vascular lesions and mass lesions of the posterior fossa. In this case, a contrast enhanced acoustic schwannoma on the right cerebellopontine angle was detected in cranial MR. Due to severe pain, TN is a very excruciating disease. In every case, cranial imaging should be performed and treatment for etiology should be applied.

Keywords: Trigeminal neuralgia, Acoustic schwannoma, Facial pain

EP-0830 [Neuro-oncology » Others]

A Pictorial Essay of NF2 Showing Maximum (17) Intracranial Meningiomas with an Unusual Spinal Tumor

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NF2 is an uncommon clinical condition. There are various criteria for diagnosis of NF2. According to Baser criteria: presence of bilateral vestibular schwannoma or first-degree relationship with NF2 with unilateral vestibular schwannoma and any 2 other NF2-associated lesions: Meningioma, Schwannoma, Glioma, Neurofibroma, Cataract. NF2 results from mutations in NF2 tumor suppressor gene located on chromosome 22q12. A 50 years old lady was suffering from occasional headache & vomiting, visual disturbance, left sided hearing impairment and gait disturbance. Symptoms were increasing gradually and at the time of presentation the unfortunate lady was bed ridden. Upon clinical evaluation she had left sided sensori-

neural deafness, café-au-lait spots at multiple sites of body with a negative family history of NF2. Contrast MRI of brain and cervical region revealed bilateral Vestibular Schwannoma, bilateral Jugular foramen Schwannoma, seventeen (17) intracranial meningiomas (supratentorial, infratentorial and intraventricular) and a cervical spinal lesion, radiologically consistent with a haemangioblastoma. Bilateral vestibular Schwannoma are the hallmark of NF2. Association of bilateral jugular foramen schwannoma & multiple meningiomas are supplementary for diagnosis. Association of a spinal haemangioblastoma is an uncommon finding to be reported.

Keywords: NF2, Multiple meningiomas, Haemangioblastoma

EP-0831

Von Hippel-Lindau Disease: A Brainstem Tumor. Case Report and Review of Literature

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Introduction: Von Hippel-Lindau disease (VHL) is a syndrome of autosomal dominant multiple hereditary neoplasms. It has an incidence of 1: 30,000 live births. VHL is associated with the high risk of developing benign and malignant tumors in various organs. In the central nervous system (CNS), the most common tumor is hemangioblastoma. These tumors are often bilateral. The most common locations are the cerebellum, spinal cord and brainstem. The diagnosis is made through computed tomography (CT) and magnetic resonance imaging (MRI).

Objective: Our objective is to review VHL, study the topography of the lesion and report a case.

Methods: We used the combinations of the words: hemangioblastoma, brain tumor, and Von Hippel Lindau.

Results: Male, 24y, diagnosed with Von Hippel Lindau 6 months ago. The examination had cerebellar syndrome. MRI showed 4 nodular images, one in the bulb. Father and grandmother with paternal diagnosis of VHL. Microsurgery was performed for tumor resection. Von Hippel-Lindau's disease is a rare syndrome. In the CNS the most common is hemangioblastoma, which affects 80% of these patients. The hemangioblastoma in VHL has cerebellar location (52%), spinal cord (44%) and brainstem (18%). They are generally multiple tumors hypervascularized. Its differential diagnosis is pilocytic astrocytoma of the posterior fossa, ependymoma and spinal schwannoma. Our case is interesting because the location of the tumor is in the brainstem.

Conclusion: Von Hippel-Lindau's disease is rare. The main CNS topography is in the cerebellum, being rare in the bulb. When we have the diagnosis it is necessary the surgical treatment.

Keywords: Brainstem, Hemangioblastoma, Tumor, Von Hippel Lindau

EP-0832 [Neuro-oncology » Others]

The Functional Brain Connectivity as a Possible Method for Preoperative Surgical Planning and a Prognostic Tool: Perspective and Pitfalls

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Background: The functional connectivity is an emerging topic in neurosurgery. In this article, we are presenting the brain functional connectivity as a possible tool for preoperative planning.

Method: A preoperative resting state fMRI (rs-fMRI) was performed preoperatively in seven patients under 3 Tesla MRI (Siemens Magnetom Skyra). The functional MRI data was preprocessed for realignment, slice time correction, normalized, coregistration with T1 MRI and smoothed. A mask of the region of interest is created using MRICron on the high resolution T1 images. The preprocessed functional images together with coregistered the high resolution structural images and the coregistered mask of region of interest are loaded in CONN functional connectivity toolbox based on Matlab (MathWorks, Natick, MA, USA). Denoising was performed followed by ROI to ROI single subject analysis.

Results: The motor, language and visual networks were reproducible in all patients. The salience and the default mode networks could be also detected. The detected networks were also detected in patients operated under anaesthesia.

Conclusion: Functional connectivity is reproducible in brain tumor patients. It could be a tool for detection of the functional areas especially in incooperative patients, patients under anaesthesia and children, when the task based fMRI is not possible.

Keywords: Functional connectivity, Resting state MRI, Preoperative planning

EP-0833 [Neuro-oncology » Others]

Brown Tumor of the Cervical Spine: First Manifestation of a Primary Hyperparathyroidism

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Brown tumors are rare non-neoplastic lesions that arise in the setting of primary or secondary hyperparathyroidism. Parathyroid adenomas or hyperplasia constitutes the major Brown tumor cause in primary hyperparathyroidism while chronic renal failure is the main cause in secondary hyperparathyroidism. The authors report a very rare cervical Brown tumor case, arisen as the initial manifestation of a primary hyperparathyroidism that led to severe cervical neuralgia. A 42-year-old woman was admitted for severe C7 neuralgia during the past two months. Her neurological examination as well as usual laboratory test values were normal. Cervical plain radiograph was also normal but spinal CT and MRI showed an expansile and lytic lesion of the C7 posterior arch causing bilateral nerve root compression. Total tumor removal was obtained by posterior approach and the definitive histological diagnosis was

Brown tumor. Further screening was then realized and high levels of PTH and parathyroid mass raised the possibility of primary hyperparathyroidism. Consecutive parathyroidectomy was done. The patient is absolutely symptom free until most recent follow-up examination, two years later. Brown tumor should be kept in mind in the differential diagnosis of lytic, expansile spinal masses even in case of unknown hyperparathyroidism. Radical surgical resection and parathyroidectomy are the mainstay of the treatment and can result in remarkable recovery.

Keywords: Cervical spine, Brown tumor, Hyperparathyroidism, Surgery

EP-0834 [Neuro-oncology » Others]

Spinal Metastasis as a First Manifestation of a Renal Cell Carcinoma: Report of a Case and Review of the Literature

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Intramedullary metastases are rare and represent only 4–8.5% of central nervous system metastases. An important feature of intramedullary metastases is the rapid progression of neurological deficits which necessitates rapid treatment. There are rare cases of intramedullary metastasis due to renal cell carcinoma and a few cases of patients in whom symptoms from the metastasis of a renal cell carcinoma preceded the detection of the primary tumor. We report the case of a 62-year-old woman complained of pain in the right limb radiating into the right leg, together with numbness in the fourth and fifth right toes. Neurological examination revealed a lumbar spinal syndrome without motor deficit. Magnetic resonance (MR) imaging demonstrated a solitary intramedullary osteolytic lesion at L5 level. The CT scan of the abdomen revealed a tumor with a diameter of 8 cm in the left kidney. Microscopic examination of the CT scan guided biopsy of the lesion concludes for a renal clear cell carcinoma Fuhrman grade II. The patient was treated radiotherapy and chemotherapy.

Keywords: Renal cell carcinoma, Spinal metastasis, First manifestation

EP-0835 [Neuro-oncology » Others]

Choroid Plexus Papilloma in an Adolescent with Alternative Adjuvant Therapy with Radiotherapy and Follow Up of 14 Years

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Plexus papilloma is a lesion of the choroid plexus, benign and rare. The therapy recommended is microsurgery with complete excision of brain tumor. We describe a case of an adolescent with this tumor, treated with surgery and adjuvant radiotherapy that allowed the inactivation of repeated cysts. 12-year-old female with headache, vomiting, decreased visual acuity, papilledema, left hemi-hypoesthesia and gait deviation to the left. Skull CT scan showed a tumor in the right lateral ventricle with dilation of the temporal and occipital horn and parietal cyst above right ventricle.

MRI revealed contrast uptake and invasion of the third ventricle through foramen of Monro. Underwent surgical treatment were noted that The tumor infiltrated Third Ventricle and was fixed at its base, not allowing resection satisfactory. Was decided to keep small part tumor and cyst fenestration. The immediate post operative period was uneventful but on the sixth day, the patient presented a ensorineural deterioration urgently taken for a CT scan which revealed recurrence of the cyst. Immediately proceeded by a cyst-subarachnoid space derivation. Pathology found choroid plexus papilloma being chosen, with oncology, radiotherapy to “inactivate cyst” and preventing the recurrence of both tumor and cyst. The epidemiology of this case is exceptional because of the age occurrence and another aspect is the fact of being an infiltrative lesion with recurrent cysts. Consequently partial resection was performed with radiation therapy contrary to the most commonly complete resection. Patient had an excellent clinical outcome, uneventful, with a follow-up of 14 years.

Keywords: Choroid plexus papilloma, Cyst, Radiotherapy

EP-0836 [Neuro-oncology » Others]

Astroblastoma: Clinical and Histopathological Features

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Background: The authors report their experience in the clinical and histological findings of the astroblastomas.

Method: Retrospective study of the histologically proven cases of astroblastomas, diagnosed between 1990 and 2011. Clinical data were reviewed for each patient and the following parameters were evaluated: gender, age at diagnosis, initial clinical symptoms and site of onset, main imaging findings and histological features.

Results: A total of 11 patients with histologically astroblastomas were investigated. The gender ratio was 0.83. The average age was 19.9 years. Clinical manifestations were presented in an acute manner, such as headache, seizure and vision changes. Magnetic resonance imaging showed exclusively supratentorially solido-cystic lesions with rim enhancement without calcification. A resection of the tumor was performed in all cases. Histologically, the tumor showed papillary architecture and pseudorosettes around the central hyalinized thickened blood vessel throughout the tumor. Individual cells were polygonal to spindled, showing moderate eosinophilic cytoplasm and eccentrically placed nuclei. The nucleus was round with coarse chromatin. Mitotic figures were rarely observed in 10 cases. Immunohistochemical stains revealed GFAP and EMA positivity. High grade was noted in one case only and recurrence was observed in one case after 2 years of follow-up.

Conclusion: Astroblastoma is one of the rarest tumors of the central nervous system, and its classification, histogenesis, diagnosis and therapeutic management are still being debated. Natural history of astroblastoma seems to place it in between astrocytoma and glioblastoma. Total resection is the best treatment but radiotherapy is to be indicated for recurrence or high histological grade.

Keywords: Astroblastoma, Cerebral, Oncology, Pathology

EP-0837 [Neuro-oncology » Others]

Safety of Perioperative Aspirin Use in Brain Tumor Surgery: To Stop or not to Stop?

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Background: In daily practice, neurosurgeons face increasing number of patients using aspirin (ASA), and tend to discontinue it 7-10 days before elective intracranial surgery. However, data is lacking to show heightened risk of hemorrhagic complications associated with perioperative aspirin continuation. We aimed to evaluate safety of perioperative aspirin use in patients undergoing craniotomy for brain tumors in this largest neurosurgical cohort reported to date.

Method: We retrospectively analyzed medical records of the patients undergoing elective intracranial tumor surgery by the senior author between 2007-2016. The patients were separated into three groups based on perioperative aspirin status: Group 1: no ASA; Group 2: ASA discontinued; Group 3: ASA continued. Collected data included demographic information, perioperative aspirin status, hemorrhagic and thromboembolic complications.

Results: A total of 1191 patients underwent 1220 operations. Group 1 included 996 patients (1019 operations), Group 2 had 99 patients (100 operations), and Group 3 had 96 patients (101 operations). Overall complication rates were 2.2%, 1.0% and 1.0%, respectively (average 2.0%) with no significant difference between groups. Hemorrhagic complications were also similar across the groups (0.7%, 1.0% and 1.0%, respectively). There were no thromboembolic complications in Group 2 and 3 whereas its incidence in Group 1 was 1.5%.

Conclusion: Perioperative aspirin use is not associated with increase in the rate of hemorrhagic complications following intracranial tumor surgery. In patients with moderate to high cardiac risk, ASA can safely be continued during elective brain tumor surgery. Nevertheless, clinical trials with larger sample sizes are warranted to reach higher statistical power.

Keywords: Aspirin, Complication, Hemorrhage, Brain tumor, Surgery, Craniotomy

EP-0838 [Neuro-oncology » Others]

Immunologic Features of Intratumoral and Peripheral Lymphocytes in Patients with Intracerebral Gliomas of Varying Degrees of Malignancy

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Biological properties and the rate of glioma growth is largely dependent upon relations intratumoral and systemic immune reactions. In neurooncological patients in peripheral blood the correlation of macrophage subpopulations CD14 / CD11 <1 (0.9)

in the tumor infiltrate 0.8, in comparison with healthy persons (>1.5). The tumor infiltration was observed increase in the content of stem tumor cells CD133 and CD15 is proportional to the degree of malignancy of glioma. The content of proapoptotic PNA⁺ receptor (to peanut lectin) on lymphocytes was significantly higher in all neurooncological patients. Level of CD95⁺ lymphocytes in peripheral blood was increased in most malignant gliomas. In gliomas of the brain is reduced effective effectornic immunological reactions, associated with the production of active forms of oxygen in macrophages and lymphocytes: phagocytosis, killing. Reactions of innate immunity saved and carbohydrate-lectinic interactions is dominated at gliomas. Increased mannose and galactose receptors on glioma cells helps to suppress the activity of these structures EK of peripheral lymphocytes and the induction macrophages in M2 subpopulation. It was noticed the various forms of influence of cells of tumor infiltrate on the immune system: it is the suppression of tumor stem cell lymphocytic germ of hemopoiesis, one of the mechanisms of which is apoptosis of peripheral lymphocytes, stimulation of T-regulatory suppressor cells for causing evasion of glioma from effector mechanisms of immunogenesis. It is the induction macrophages M2 phenotype having suppressive effect on the immune cells; product of glioma cells suppressor factors that block the cytotoxic and killer effects of immune cells in the tumor.

Keywords: Glioma, Systemic immune reactions, Intratumoral infiltrate

EP-0839 [Neuro-oncology » Others]

Ependymoblastoma: Report of 8 Cases

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Background: Ependymoblastoma is a rare malignant brain tumor of early childhood. Data on clinical behavior and optimal treatment strategies are scarce. We report 8 cases in children with confirmed diagnosis of CNS ependymoblastoma, diagnosed in the pathology department of la rabta's hospital.

Method: Retrospective study of the histologically proven cases of ependymoblastomas, diagnosed between 1992 and 2010. Clinical data were reviewed for each patient and the following parameters were evaluated: gender, age at diagnosis, initial clinical symptoms and site of onset, main imaging findings and histological features.

Results: There was no gender predominance with a sex ratio 1:1. The average age was 6.5 years (range 1 month to 7 years). Clinical manifestations included signs and symptoms of increased intracranial pressure (headache, nausea and visual disturbances). all tumors were located in the cerebral hemispheres. A resection of the tumor was performed in all cases. The key for the histological diagnosis is the presence of a uniform poorly differentiated neuroepithelial cells, multilayered ependymal rosettes, perivascular pseudorosettes, and numerous mitotic figures. All the 8 cases have had a complete surgical removal, radiotherapy and high dose chemotherapy with a poor prognosis.

Conclusion: Data on clinical features and optimal treatment strategies of children with ependymoblastoma are rare, and the

prognosis is still poor. Further studies are needed to determine the clinical, biological and pathological prognostic factors in order to improve survival of children with this rare malignant central nervous system tumor.

Keywords: Ependymoblastoma, Central nervous system, Primitive neuroectodermal tumor, Children brain tumor

EP-0840 [Neuro-oncology » Others]

Olfactory Neuroblastoma: A 21-Year Experience

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Background: Olfactory neuroblastoma is a rare malignancy, with poorly defined treatment protocols. The authors report their experience in the clinical and histological findings of the olfactory neuroblastoma.

Method: Retrospective study of the histologically proven cases of olfactory neuroblastoma, diagnosed between 1994 and 2015. Clinical data were reviewed for each patient and the following parameters were evaluated: gender, age at diagnosis, initial clinical symptoms and site of onset, main imaging findings and histological features.

Results: A total of 12 patients with histologically Esthesioneuroblastoma were investigated. The gender ratio was 0.71 for a female predominance. The average age was 45 years. Clinical manifestations included nasal obstruction, epistaxis and headache. A resection of the tumor was performed in all cases. Microscopic examination revealed tumor composed of small round cells arranged in lobular pattern separated by fibrovascular stroma. These tumor cells are arranged in pseudorosettes and glandular patterns, and showed round to oval hyperchromatic nucleus with few presenting salt and pepper chromatin pattern. The stroma is fibro-cellular and vascular with focal areas of neurofibrillary matrix, giant cells and mitoses. Sarcomatoid differentiation was noted in one case. Recurrence was observed in 3 cases. Metastasis happened in one case.

Conclusion: Olfactory neuroblastoma is a rare malignant tumor with varied clinical behavior. A proper diagnosis should be made through clinical, radiological and pathological findings and the tumor should be staged and graded before proceeding to surgery. Aggressive surgical resection and radiotherapy is the mainstay of treatment as recurrence and metastasis are so common for those tumors.

Keywords: Olfactory neuroblastoma, Esthesioneuroblastoma, Pathology

EP-0841 [Neuro-oncology » Others]**Langerhans Cell Histiocytosis Presenting as an Osteolytic Lesion of the Frontal Bone with Soft Tissue and Intracranial Extra-Axial Involvement. Case Report**

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Langerhans cell histiocytosis (LCH) is a rare condition that represents a clonal proliferation of abnormal Langerhans cells. LCH usually affects the pediatric population with an annual incidence of 1-7:1.000.000 of population. Clinical manifestations of LCH disease range from isolated bone lesions to multisystem disease. Pathological findings are invariable regardless of the disease manifestation. Diagnosis is completed by histochemistry with identification of the CD1a and S-100 surface markers. Intracranial extension by primary soft tissue LCH lesion is uncommon. We report a case of a 70 years old woman that presented initially with signs of mild TBI, she had no loss of consciousness nor post-traumatic amnesia, neurological status was unremarkable, still she mentioned some pain, bruises and a bulge in the right fronto-temporal area. A skull x-Ray was performed and revealed no fracture, deformity nor other lesion. We concluded that she had an epidural hematoma, and was discharged home with head injury warning instructions accordingly to our institutional protocol. On admission 3 weeks later she presented repeatedly with the enlargement of the preexisting tumescence. The CT scan findings were more consistent for an osteolytic lesion of the frontal bone with soft tissue and intracranial extra-axial involvement. Surgery was performed and total removal of the tumour was achieved. Cranioplasty of the skull defect was done using methyl-methacrylate. Histochemistry confirmed the diagnosis of LCH, thereby she was referred for the adjuvant therapy and in one month she started chemotherapy. Unfortunately patient died 8 months after the operation because of multiple bone metastases.

Keywords: Langerhans cell histiocytosis, Osteolytic lesion of the frontal bone, Isolated bone lesions, Intracranial extension, Histochemistry

EP-0842 [Neuro-oncology » Others]**A Rare Case of Isolated Intracranial Rosai-Dorfman Disease Mimicking Optic Nerve Meningioma: A Case Report and Literature Review**

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Sinus histiocytosis with massive lymphadenopathy or Rosai-Dorfman disease (RDD) was first described in 1969 as a reactive condition of unknown etiology, characterized by a proliferation of histiocytes exhibiting emperipolesis of lymphocytes and plasma cells. It usually presents with painless cervical lymphadenopathy with or without extranodal manifestations. [1] Intracranial

involvement of this disease is extremely rare.[2] Intracranial RDD occurs in less than 5% of the total number of patients with extranodal disease. We report a case of RDD with isolated intracranial involvement. A 67-year-old man came with long-standing headache; retroocular pain and progressive visual loss of the left eye. The magnetic resonance imaging (MRI) showed features of optic nerve meningioma. The histopathology revealed sheets of histiocytes displaying emperipolesis. These histiocytes were S100 positive but CD1a and epithelial membrane antigen negative.

Keywords: Rosai-Dorfman disease, Optic nerve meningioma, Isolated intracranial Rosai-Dorfman disease

EP-0843 [Neuro-oncology » Others]**Tentorial Meningiomas**

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Background: A retrospective study of this rare pathology, showing a report of 93 cases of tentorial meningiomas, their particularities and difficulties of surgical management, including post operative deficits and the better approach to each case. An comparative of our results with the literature it's also made.

Method: We made a retrospective analyzes of our 93 tentorial meningiomas, comparing the different approaches and the results of each of them, therefore to analyzed if it were the correct choice for that particular case, considering pre operative status of the patients, Simpson grade of surgical removal and post operative deficits. Our casuistic consist in 79 cases, 26 in the middle fossa and 53 in the posterior fossa. 34 were men and 45 women, the age factor were between 32-74 years old. Diagnostic were made by MRI and CT in the investigation of the patients symptoms.

Results: We observe a 49 total macroscopical removal of the tumor, 19 Simpson grade I, 17 grade II, and only 8 cases of grade V removal. We have 9 recidives growing, 19 cranial nerve deficits, only 2 cases of death and 67 cases return to a normal and productive life. We performance different kinds of approaches, chose case by case, like pterional, sub and pre temporal, parieto-occipital, retrosigmoid, far lateral, suboccipital retrosigmoid and suboccipital transtentorial approaches. And we discuss the advantage and difficulties of each of them.

Conclusion: This retrospective study shows different kinds of presentation of this rare disease, and the good surgical results by choose different kinds of approaches.

Keywords: Tentorial meningioma, Approach, Results analysis

EP-0844 [Neuro-oncology » Others]**Intra Medullary Cavernous Hemangioma About a Case**

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Intramedullary cavernoma is a rare vascular malformation. It accounts for about 5 % to 12% of spinal vascular malformations and 3% of the intradural vascular malformations. It may be asymptomatic for a long time or be responsible for a progressive

or sudden alteration of marrow functions. Its diagnostic relies on a magnetic resonance imaging (MRI) of the medulla and an anatomic pathology. Surgery constitutes its main management; nevertheless, surgery is not exempted from complications. We report a case of intramedullary cavernoma in a 24 year-old female patient, admitted for a slow spinal cord compression with a paraparesis that has been progressing for two years. MRI of the medulla objectified an intramedullary lesion at T7-T8. A complete exeresis of the tumor was performed on the patient. The surgical technique is the same as for intramedullary tumor processes. After a laminectomy and dural opening centered on the pathological zone, the hematoma must be evacuated and the malformation excised under an operating microscope. Intramedullary cavernoma was confirmed histologically. The clinical course was characterized by a partial aggravation of motor deficit. Through this case report, the authors discuss clinical and radiological aspects, as well as management of this rare disease

Keywords: Cavernoma, Intramedullary, Vascular malformation

EP-0845 [Neuro-oncology » Others]

The Cerebral Hernia Secondary to Recurrent Pituitary Apoplexy: Case Report and Literature Review

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Pituitary apoplexy (PA) presenting with intracerebral hemorrhage (ICH) is rare, and it followed by cerebral hernia has never been reported. The author report a 51-year-old male that he was manifested with conscious disturbance and cerebral hernia on the left side caused by massive ICH resulting from pituitary apoplexy. The patient had been diagnosed as pituitary adenoma and resected the adenoma by craniotomy eight years ago. Many considerations were taken into account in making a decision that the patient was immediately transferred to the operating room for urgent microsurgery evacuation of hematoma, tumorectomy, and decompressive craniectomy. Consequently, the patient showed an excellent recovery and he was discharged thirty-five days after the surgery. This case illustrates that pituitary apoplexy may manifest as ICH even cerebral hernia, evacuation of hematoma and decompressive craniectomy as soon as possible should be performed in patients.

Keywords: Pituitary apoplexy, Cerebral hernia, Intracerebral hemorrhage, Decompressive craniectomy

EP-0846 [Neuro-oncology » Others]

The Results of Combined Treatment of Glial Brain Tumors

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In this work, we decided to analyze the data of 159 (87 men, 72 women) patients with glial brain tumors, who underwent surgery in period during 2013-2016 years. These statistics indicate that by degree of malignancy (WHO grade), the highly glial tumors (WHO grade I, II) were observed in 53.9 % and poorly differentiated and non-differentiated glial tumors (WHO grade III, IV) in 46,1

% patients. By localization: in 56.4 % patients the tumor was located in the left hemisphere, in 43,6 % - in the right hemisphere. On the majority of patients (25,6%) tumors were located in the temporal lobes, in frontal lobes – 15.4%, temporoparietal – 10,3%, frontotemporal – 12,8% and in the frontoparietal region - 7,7 %. To all patients in the postoperative period was appointed radiotherapy. Catamnesis had been studied from 6 months to 1 year only of 14 patients, who received radiation therapy in a total dose of 56-60 Gy. Of these, in 3 patients with hypergrade glial tumors, in the control MRI was detected tumor recurrence. At one of them was revealed glioblastoma and he was appointed to radiotherapy, which he did not accept. In the remaining 2 patients, despite the comprehensive treatment, including radiation therapy, had been developed recurrence. These patients assigned to chemotherapy. Thus, glial tumors among our patients, according to histology are highly differentiated, advantage intracerebral tumors (WHO grade I, II) – 53.9%.

Keywords: WHO-grade, Glial tumors, Radiotherapy

EP-0847 [Neurotraumatology and Neuro Critical Care » Basic Science]

Evaluation of the Effects of Long and Short Term Dexamethasone Treatment After Severe Head Injury

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Background: Corticosteroids were used to treat severe head injury for over 30 years. In our study, we investigated the beneficial effects of short and long term corticosteroid therapy on cerebral edema in a rat model of head trauma. We also evaluated the side effects of the therapy in the respiratory system.

Method: Thirty eight male Sprague-Dawley rats weighting 300-350 g were used for the study. The animals were divided into four experimental groups; group 1 (sham), group 2 (short term steroid treatment only), group 3 (long term steroid treatment only), group 4 (trauma only), group 5 (trauma plus short term steroid treatment), group 6 (trauma plus long term steroid treatment).

Results: In group 4, almost all lung samples showed peribronchial chronic inflammatory reaction and there was uniformly hemorrhage as well as edema in brain samples secondary to trauma. In group 5, all lung samples contained significant alveolar congestion, and mild edema with no visible hemorrhage was noticeable in brain samples. In group 6, chronic diffuse pneumonia, peribronchial inflammatory response, and intraalveolar consolidation were the main characteristics of the lung samples. There were focal gliosis and signs of old hemorrhage in brain samples in this group.

Conclusion: Although there was attenuation in cerebral edema, particularly with long term corticosteroid therapy, in our rat model of traumatic head injury, accompanying systemic infections were also noticeable. In our opinion, predilection to systemic infections may outweigh the beneficial effects of these agents for this purpose.

Keywords: Cerebral edema, Dexamethasone, Severe head injury

EP-0848 [Neurotraumatology and Neuro Critical Care » Basic Science]**Does Antioxidant Status Capacity in Traumatic Brain Injury Correlate with the Severity of Injury?**

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Background: Traumatic brain injury (TBI) is a common cause of death. This study was aimed to identify the relationship between severity of head injury and total antioxidants status of the patients.

Method: Patients were recruited from Trauma Centre and this included varying degree of TBI in isolation of other injury. The recruitment was through systematic sampling technique. Serum antioxidants status was evaluated by measuring Total antioxidant status (TAS) level. TAS level was correlated with varying degree of severity of head injuries using Glasgow Coma Scale (GCS) Scoring system.

Results: Sixty (60) patients (mean age 35.1 ± 11.4 years; 83.3% male, 16.7% female). This study showed that patients with mild head injury have high TAS level while those with moderate to severe head injury have low TAS level and this result is statistically significant. Correlations of Glasgow coma scale (GCS) score with TAS level showed high TAS levels in patients with mild head injury and lower levels were found among the moderate and severe head injured patients which was significant statistically

Conclusion: Oxidative stress plays vital role in severity of traumatic brain injury and TAS level may be useful in predicting prognosis of traumatic brain injury.

Keywords: Antioxidant status, Traumatic brain injury, Severity

EP-0849 [Neurotraumatology and Neuro Critical Care » Basic Science]**Various Clinical Presentation Experience of Traumatic Cerebrospinal Fluid (CSF) Fistula of a Single Medical Institute**

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Traumatic cerebrospinal fluid (CSF) fistula usually result from a tear in the dura mater and arachnoid membrane after compound skull vault wounds. The diagnosis is made by either laboratory test, such as glucose strip test or beta-2-transferrin test, or intracranial air on computed tomography (CT) scan. The most important complication of a CSF fistula is infection and fistulas that do not heal or recur require surgical treatment. Surgical treatment is performed endoscopically or intracranially. We introduce various clinical experience of CSF fistula of our hospital during 2 years. We experienced 4 cases of CSF fistula presenting different clinical manifestation recent 2 years. The first patient presented CSF rhinorrhea immediately after trauma with linear fracture of ethmoid bone. CSF fistula was healed in a week using lumbar drainage. The

second patient complained watery rhinorrhea after 3 weeks of trauma. Rhinorrhea persist despite the conservative treatment and repetitive operation had done. The third patient had suffered from several times of meningitis. Bone defect of anterior cranial fossa was found after 14 years of trauma. Intracranial repair was done successfully and he was freed from recurrent meningitis. The last patients was semicomatose status and huge intracerebral hemorrhage (ICH) was on CT scan. Traumatic CSF fistula show various clinical presentation. In some cases, conservative treatment was enough but other cases needed operation. In a trauma patient with signs of a skull base fracture, evidence of CSF fistula should sought actively and appropriate treatment for the patient's condition should be chosen.

Keywords: Trauma, CSF fistula, Clinical presentation

EP-0850 [Neurotraumatology and Neuro Critical Care » Basic Science]**Uncovering a New Mechanism of the Charging Effect of Epicardiac Ganglia and Their Effects on Heart Life Expectancy Following Brain Death After Subarachnoid Hemorrhage: Experimental Study**

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Background: Cardiac death is described algebraically multiform shaped electrocardiographic waves are transferred to linear form. Undescribed effects of charging effects of epicardiac ganglia their effects on heart life expectancy was examined following brain death after subarachnoid hemorrhage.

Method: This study was conducted on 25 hybrid rabbits. Five of them control and five of them SHAM with the application of 1.00 cc saline injection to cisterna magna. The remaining animals (n=15) objected to injection of lethal dose of 1.00 cc autologous blood into their cisterna magna. Animals monitored and electrocardiographic waves were recorded become to linear form. Vagal networks architectures, EEG findings and epicardiac ganglia numbers and normal and their degenerated neuron densities were compared statistically.

Results: One animal of SHAM and three animals of study group dead in the first day. Only six animals survived along three days with their low grade Glasgow Coma Scale values (GCS<10). Mean normal epicardiac ganglia numbers of all animals was estimated as 6 ± 2 and normal neuron density was 3.980 ± 830 of all animals. These values were estimated as 4 ± 1 and neuron density of epicardiac ganglia was estimated as $2.450 \pm 254 / \text{mm}^3$ in early dead animals

(n=8); and 8 ± 1 , $4.200 \pm 890/\text{mm}^3$ in surviving animals (n=5). Epicardiac ganglia numbers and neuronal degeneration was more prominent in dead animals.

Conclusion: The loss of charging effects of normal epicardiac ganglia and numbers of epicardiac ganlia neuron density may be a causative factor on the heart survive periods following brain death after subarachnoid hemorrhage.

Keywords: Brain death, Cardiac arrest, Epicardiac ganglia

EP-0851 [Neurotraumatology and Neuro Critical Care » Basic Science]

Relation of Neurogranin, S100b, GFAP Levels to Intracranial Traumatic Lesions in Patients with Mild Head Injury

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Background: In clinical practice, there is a clear dilemma for computerized tomography imaging and observation of patients with mild head trauma. In the future, brain damage-specific brain markers are thought to help resolve this bias. In order to make a contribution to literature, we compared the radiological images of patients who applied to our emergency department with mild head injury (MHI) and the levels of novel molecule neurogranin (NRGN) and GFAP, S100B.

Method: A study group was performed from patients with a glasgow coma score of 15 who was admitted to the emergency department with a complaint of MHI and accompanied by at least one of the head trauma “red flag” symptoms. Serum NRGN, GFAP, S100B measurement and CT scanning were performed in all patients. Any intracranial pathology associated with an injury (acute subdural, epidural or parenchymal hematoma, traumatic subarachnoid haemorrhage, cerebral contusion) detectable on CT scan was considered positive (i.e., CT+)

Results: Significantly higher values of protein NRGN were found in CT positive than in CT negative patients. (597.3 versus 406.7 ng/ml) ($p=0.017$) NRGN cut-off value was 236.3ng / ml, sensivity was 79.31% and specificity was 51.06%.

Conclusion: In this study, the diagnostic process of the patients with suspected MHI was analyzed. Our results portrayed that NRGN increased in the blood samples of MHI patients; outlining the diagnostic ability of NRGN in MHI. Larger TBI studies should be performed to seal the role of NRGN to become “the biomarker” for TBI.

Keywords: Neurogranin, Mild head injury, Computed tomography, S100b, Gfap

EP-0852 [Neurotraumatology and Neuro Critical Care » Basic Science]

Management and Outcome of Moderate Head Trauma: Our Experience

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Aim: To follow-up patients with moderate head trauma who were admitted to Mansoura University Hospital in the period from 1 December 2015 to 30 July 2016 until discharge and determine the outcome of head trauma.

Method: This prospective study were conducted on all patients with moderate head trauma admitted to Mansoura Emergency Hospital during the period from 1 Dec. 2015 to 30 Jul. 2016 with exclude Polytrauma, bleeding disorders, liver and kidney disease patients.

Results: We correlated different risk factors with management and with outcome. Management may be surgical or conservative and outcome may be alive or dead. We have 60 patients with 17 cases (28.3%) were treated surgically and 43 cases (71.6%) were treated conservatively. According to outcome 36 cases (60%) were alive and 24 cases (40%) died. According to sex, 10 cases (17%) were female and 50 cases were male (83%) with statistically non-significant effect on outcome ($P = 0.7$) and management ($P = 0.7$). Cause of injury had statistically significant effect on management ($P = 0.02$) and statistically non-significant effect on outcome ($p = 0.4$). GCS on admission had no statistically significant effect on management ($P=0.8$) and outcome ($P=0.1$) with mean of 10.1 ± 1.2 and GCS on discharge had no statistically significant effect on management ($P=0.6$).

Conclusion: There were significant effect of age of patients, systemic diseases, type of lesions and serum electrolytes on outcome which determined by GCS at discharge, length of hospital stay, and the state of the patient at discharge.

Keywords: Glasgow coma scale, Road traffic accident

EP-0853 [Neurotraumatology and Neuro Critical Care » Basic Science]

Association of Hyperchloremia with Mortality in Decompressive Craniectomy

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Background: Of many critical care regimens, the management of physiological disturbances in serum is particularly drawing an attention in conjunction with patient outcome. The aim of this study was to assess the association of serum biochemical markers with mortality in head trauma patients with decompressive craniotomy.

Method: Ninety-six patients with acute subdural hematoma underwent decompressive craniectomy between January 2014 and December 2015. The clinical data and laboratory variables of these patients were recorded and analyzed retrospectively. The pre-operative and post-operative day (POD) 0, day 1 and day 2

serum variables were measured. These were compared between the survivors and non-survivors.

Results: The factors of a large amount of intra-operative blood loss, shorter length of intensive care unit stays, and the needs for mechanical ventilation were related with mortality in the patients with decompressive craniectomy. These clinical factors were associated with the physiological derangements of sera. The average difference in serum chloride concentration between the pre-operative and POD 2 measurements ($p=0.0192$) showed a statistical significance in distinguishing between survivors and non-survivors. The average differences in albumin ($p=0.0011$) and platelet count ($p=0.0004$) between the pre-operative and POD 0 measurements suggested to be strong predictors of mortality in decompressive craniectomy.

Conclusion: Isolated values of physiological biomarkers are not sufficient enough to predict in-hospital mortality. This study emphasizes the importance of a combined prognostic model of the differences in the pre-operative and post-operative hyperchloremia, thrombocytopenia, and hypoalbuminemia to identify the risk of mortality in decompressive craniectomy.

Keywords: Physiologic biomarkers, Hyperchloremia, Decompressive craniectomy

EP-0854 [Neurotraumatology and Neuro Critical Care » Basic Science]

Progesterone Use For Acute Traumatic Brain Injury is no More Supported-A Systematic Review & Meta-Analysis

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Background: Traumatic Brain Injury (TBI) is known as one of the leading causes of mortality and disabilities especially in young-aged people. Regardless of over 30 years of Neuroprotective agents use for TBI management, currently there is no absolute recommended agent for the condition yet.

Method: A systematic review & Meta-analyses, with wide proposal keywords had been ran in "Cochrane CENTRAL", "MedLine/PubMed", "SCOPUS", "Thomson Reuters Web of Science", "SID.ir", "Barkat Foundation", and "clinicaltrials.gov" databases up to September 06, 2015; this study limited the retrieved search results only to those used Progesterone for acute TBI management. The Randomized Clinical Trials (RCT) quality of reporting adapted to CONSORT 2010 before extracting their data into meta-analysis. This study assessed the favourable outcomes of patients and mortality according to Glasgow Outcome Scale (GOS) or its Extended version (GOS-E), also any form of adverse-effects that been reported in the included RCTs.

Results: Seven RCTs retrieved for this topic, of which two of them were huge phase-III RCTs; overall three of them been excluded from analysis and remaining four studies with 2320 cases analyzed for favorable outcomes and mortality, also two studies with 982 cases assessed for adverse-effects. Which showed no significant difference between two progesterone and placebo groups in favorable outcome, neither mortality, nor adverse-effect analyses.

Conclusion: Current use of Progesterone for acute TBI is no more supported according to this study's results; instead, experts

recommended using other gonadal-steroids for acute TBI management.

Keywords: Head injury, Neuroprotective agents, Progesterone, Systematic review

EP-0855 [Neurotraumatology and Neuro Critical Care » Basic Science]

The Effect of High Mobility Group Box-1 Protein on Cerebral Edema, Blood-Brain Barrier, Oxidative Stress and Apoptosis in Traumatic Brain Injury

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Background: The HMGB-1 protein, which is released from necrotic tissues after traumatic brain injury and thought to start neuroinflammatory process. The aim of this study was to investigate the effects of HMGB-1 on its receptors TLR-4 and RAGE, cerebral edema, blood-brain barrier, oxidative stress and apoptosis in experimental traumatic brain injury.

Method: 30 Sprague-Dawley rats, weighing 280-320 g with age of 10-12 weeks, were used for the experiments. The rats were randomly assigned to 3 groups: 1) Control, 2) TBI and 3) TBI + ethyl pyruvate group ($n=10$ for each group). HMGB1, TLR-4, RAGE, occludin, claudin-5, ZO-1 levels are investigated by Western Blot analyses and immunohistochemistry examinations. To assess apoptosis, TUNNEL for immunohistochemistry and Western Blot for bax, bcl-2, caspase 3 were performed. Total oxidant and antioxidant capacity and oxidative stress index were evaluated in blood samples. Brain water content for determining cerebral edema was calculated by weighing wet and dry weight of the brain tissue.

Results: HMGB-1, TLR-4 and RAGE expressions and proapoptotic (bax, caspase 3) levels, brain edema increased and occludin, claudin-5 and ZO-1 expressions and antiapoptotic (bcl-2) levels decreased after TBI. These effects came to similar levels as the sham group in the group treated with ethyl pyruvate, a HMGB-1 inhibitor.

Conclusion: HMGB1 protein triggers secondary injury mechanisms by increasing blood-brain barrier dysfunction, cerebral edema, oxidative stress and apoptosis, so HMGB-1 protein plays a key role in the pathophysiology of traumatic brain injury. HMGB-1 protein may be a potential target for the treatment of TBI.

Keywords: Apoptosis, Brain edema, HMGB-1, Traumatic brain injury

EP-0856 [Neurotraumatology and Neuro Critical Care » Basic Science]**Head Injury “Epidemiological Profile in a Reference Hospital of São Paulo City”**

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Background: Head trauma is one of the main causes of morbidity and mortality in Brazil, burdening national health system. The main goal of this study is to identify the epidemiological profile of head injury patients in a hospital of São Paulo City.

Method: Retrospective study was performed using medical records of patients examined between July and December 2014. We analyzed statistic data and information concerning the most prevalent injuries and its neurosurgical approach.

Results: We noticed high incidence of head injury in 2014 despite changes made on public health system where mild head trauma are dismissed on basic health unities, being referred to the hospital only moderate to severe trauma after clinical, traumatological and imaging investigation. Motorcycle and automobile accident, fall from stairs or roof and aggression were predominant, most of the times leading to neurosurgical approach.

Conclusion: Head trauma patients are the most frequent reason for neurosurgical evaluation in a Reference Hospital. The severity and consequences of this pathology demonstrate the need to expand and improve neurosurgical care, in order to minimize brain injury burden and prevalence.

Keywords: Head trauma, Brain injury, Epidemiology, Statistics

EP-0857 [Neurotraumatology and Neuro Critical Care » Basic Science]**Neuroprotective Agents Use for Traumatic Brain Injury: A Systematic Review & Meta-Analyses**

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Background: Traumatic Brain Injury (TBI) is the leading cause of mortality and morbidity especially in young ages; regardless of over 30 years of Neuroprotective agents use for TBI management, no evidence-based recommendation for any neuroprotective agent with favorable outcomes and less adverse-effects has been made in TBI management.

Method: A wide search strategy run in “Cochrane CENTRAL”, “MedLine/PubMed”, “SCOPUS”, “Thomson Reuters Web of Science”, “SID.ir”, “Barket Foundation”, and “clinicaltrials.gov” databases up to September 06, 2015. The retrieved Randomized Clinical Trials (RCTs) were assessed for their quality of reporting by adapting to CONSORT-checklist prior to extracting their data into meta-analysis. The meta-analyses in this review was conducted for Glasgow Outcome Scale-Extended (GOS-E) in acute TBI patients, mortalities and adverse-effects.

Results: Data from 32 studies were classified into 10 neuroprotective sub-groups. 18 studies with 4637 participants included in 6 topics reviews & meta-analyses; while another meta-analysis of 4 phase-III studies ran in final conclusion.

Discussion: Oxygen using in acute management of TBI reduces mortality rates obviously, however, no significant change seen in favorably outcomes. Corticosteroid use in solo acute TBI management must be prohibited. Current routine use of Citicoline in acute TBI is no more supported. Cyclosporine A use for ICP control, depends on the available resources. Rivastigmine use for chronic TBI management of neurocognitive conditions, had some benefits in severe impaired participants. Other Neuroprotective agents use for acute or chronic management of TBI, has no field of support yet and they need more researches and clinical trials.

Keywords: Traumatic brain injury, Head injury, Neuroprotective agents, Systematic review, Meta-analysis

EP-0858 [Neurotraumatology and Neuro Critical Care » Basic Science]**TDP-43 Proteolysis Is Associated with Reactive Astrocyte**

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Transactivation response DNA-binding protein 43 (TDP-43) proteinopathy has been recognized as the major disease protein in frontotemporal dementia (FTD) and amyotrophic lateral sclerosis (ALS). Recently, TBI has also been suggested as a risk factor for neurodegenerative conditions, and TDP-43 has been observed in both patients with acute TBI and long-term survivors. However, the mechanism underlying the contribution of TDP-43 to the pathogenesis of TBI remains unknown. We used a rat model of TBI to show that increased TDP-43 proteolysis following TBI produces FTD-like impairments. In the TBI rat model, behavior and TDP-43 inclusions were assessed following intracranial administration of a caspase-3 inhibitor or vehicle. Rats developed behavioral impairment similar to those in patients with FTD after TBI. Further, the behavioral impairments were likely associated with TDP-43 short fragment mislocalization and accumulation. Our findings suggest that TDP-43 proteolysis can be involved in TBI, and that TDP-43 and its fragments may cause impaired behaviors in TBI rats.

Keywords: TBI, TDP-43, Caspase

EP-0859 [Neurotraumatology and Neuro Critical Care » Basic Science]**Spontaneous Resolution of Post-traumatic Chronic Subdural Hematoma: A Case Report**

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Chronic subdural hematomas often occur in late middle and old age following trivial head trauma. Surgical intervention is the first treatment option in chronic subdural hematomas which compressed the cerebral parenchym. Hematoma may be calcified or ossified in untreated patients. Spontaneous resolution of post-traumatic chronic subdural hematoma is a rare event. Spontaneous

resolution is rarer if the subdural hematoma is bilateral. In the literature, this condition is reported mostly in patients with idiopathic thrombocytopenic purpura. Here, we present a case of spontaneously resolved post-traumatic bilateral chronic subdural hematoma within a period of one month in a 55-year-old male and we discuss the probable mechanisms of pathophysiology in the spontaneous resolution of chronic subdural hematoma.

Keywords: Antiaggregation therapy, Chronic subdural hematoma, Spontaneous resolution

EP-0860 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Transnasal Approach for the Treatment of Dural Defect of Skull Base

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Background: Cerebrospinal rhinorrhea involves a breakdown of the barriers that separate the subarachnoid space from the nasal cavity. It may lead to ascending meningitis which commits life and functional prognosis of patient. Since twenty years, the endoscopic transnasal approach has been developed and will be the treatment of choice. We have introduced this technique in our neurosurgical department in 2012. Our objectives are to evaluate the results of our technique for repair CSF leak and study post-operative follow.

Method: This retrospective evaluative study included 40 patients. We evaluated the results of this surgical technique and we compared them with several series in literature.

Results: In our series, the cerebrospinal rhinorrhea occurred 1.3 times greater in men than women. The patients ranged in age from 6 to 58 years (men age, 32.83). Post-traumatic CSF Leaks were the most frequent 66.6%, with a meaningful male predominance (sex-ratio 4M/1W) and a mean age of 25 years. Public road accident was the major cause (83.3%) followed by domestic accidents 11.7%. Spontaneous CSF leaks occurred 2 times greater in women than men with a mean age of 40 years. The most common presenting sign was unilateral watery rhinorrhea 96.6%. The most frequent CSF leak location was the ethmoidal roof –cribriform plate (53.3%). One patient of our series had meningitis. The success rate in endoscopic surgery was 96.6% without recurrence with a follow up between 12 and 36 months. Because of the failure of endoscopic technique on one patient, intracranial reoperation has allowed depletion of rhinorrhea.

Keywords: Cerebrospinal rhinorrhea, Endoscopic surgery, Endonasal surgery, Meningitis, Fluorescein, Fistula

EP-0861 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Compare the Unilateral and Bilateral Hemicraniectomy in Infarction Patient

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Background: In massive cerebral edema caused by massive cerebral stroke, unilateral or bilateral hemicraniectomy may be the most common Decompressive Craniectomy (DC) method. The authors compared the clinical outcomes according to the DC methods.

Method: Sixty patients who underwent unilateral (27 patients) or bilateral (33 patients) hemicraniectomy for major cerebral stroke were included in this retrospective analysis. All patients had ventricular ICP monitored during and after the surgery and had the decompressed bone size measured. The neurological outcome and cerebral perfusion pressure (CPP) values were compared according to the DC methods, DC bone size, initial and post-operative ICP and CPP trend.

Results: Neurological outcomes, mortality rates (25.9% vs. 42.4%, $p=0.144$) and favorable outcomes (22.2% vs. 24.2%, $p=0.551$) were similar in both groups. The DC bone size of offending side was larger in the unilateral DC group than bilateral DC group (46.3% vs. 37.8%, respectively, $p=0.020$). Neurological outcome correlated with offending side DC bone size ($p=0.037$), but not in total DC bone size ($p=0.968$). And the lowest CPP value for favorable outcome showed a statistically difference with the CPP over 50 mmHg ($p=0.039$ vs. 0.102).

Conclusion: The total DC bone size did not influence the postoperative ICP, CPP or neurological outcome. The offending side DC bone size was larger in the unilateral DC group. From this study, authors would like to say that unilateral DC is more convenient for major stroke patients.

Keywords: Cerebral perfusion pressure (CPP), Decompression bone size, Decompressive craniectomy (DC), Intracranial pressure (ICP)

EP-0862 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Comparative Characteristics of Cranioplasty in Patients with Depressed Fractures of the Anterior Walls of the Frontal Sinuses

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Background: The frontal sinus fractures accounts for only 5-15% of all fractures of the upper parts of the facial skeleton. This type of fractures results in severe cosmetic defects in 75% of all patients. Our aim is to compare the outcomes of cranioplasty made with the use of different kinds of grafts in patients (hereinafter - pts) with depressed fractures of the anterior walls of the frontal sinuses.

Method: A retrospective analysis of 34 medical charts of pts, who were treated with the use of different types of grafts. Criteria: Group (hereinafter - gr) 1 (16 pts) – sets of titanium plates are applied for osteosynthesis. Gr 2 (16 pts) – polymethyl acrylate is used for osteosynthesis. Gr 3 (2 pts) – sets of titanium plates are applied for osteosynthesis with the use of 3D printer. CT-scans with 3D modeling.

Results: It has been revealed that the average duration of surgery in the gr 1 and 3 pts was 40 min (45%) less than in those from gr 2, and accounted for 50 и 90 min, respectively. The average hospital stay of the gr 1 and 3 pts was 4 days (57%) less than for those in gr 2. Complications occurred in 3 pts (8%) of gr 2, which was seen as graft rejection.

Conclusion: Conduction of reconstructive surgical operations with the use of titanium graft allows for decreasing the duration of surgery and days of stay in hospital, as well as the risks of purulent and septic complications.

Keywords: Trauma, Cranioplasty, Frontal sinuses

EP-0863 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Mini Craniotomy for Acute Subdural Hematomas in Selected Patients

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Background: The golden standard for acute subdural hematoma operations is of course an extended craniotomy, in order to be able to identify and control the possible source of bleeding. But many of the patients are of significantly old age (>80 yrs), and have significant comorbidities that highly reduces their chance of survival after a copious surgery. Could we do something better for them?

Method: We compared the results for a subgroup of 24 high risk patients (Gr A1, Mean age 76, 3 yrs) of a group of 62 who were operated with conventional large craniotomies (Gr.A, Mean age 62,5 yrs) and compared them to the results for 32 patients (Gr B., Mean age 78,2 yrs) who were operated with a mini craniotomy of approximately 4cm diameter.

Results: For subgroup A1 mean operative time was 83mins, survival was 25,8% of which approximately 80% had a favorable GOS (4-5). For Group B mean operative time was 38mins, survival was 51,3% of which 76% had a favorable GOS. And - for comparison purposes- Group A mean operative time was 80 mins, survival was 55,6% with 72% favorable GOS.

Conclusion: A mini craniotomy that significantly reduces operative time could be very beneficial in terms of survival for elderly patients in severe condition and with significant comorbidities

Keywords: Acute subdural, Mini craniotomy, Results

EP-0864 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Approaches for the Treatment of CSF Fistula

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Background: The current treatment for cerebrospinal fluid (CSF) fistula (rhinorrhea) is surgical repair of the fistula. The aim of this study was to investigate different surgical approaches for the treatment of CSF fistula regarding several pre- and postoperative variables to reveal the best surgical option for these patients.

Method: Patients' files were retrospectively reviewed. Twenty-six patients who underwent surgical treatment for the treatment of rhinorrhea were included in the study. Different surgical techniques were used in these patients.

Results: Patients who had extensive comminuted fractures of the anterior skull base and additional brain injury besides rhinorrhea underwent craniotomy (n=14). Osteoplastic frontal sinusotomy was used in 2 patients who had a dural defect located at the posterior

wall of frontal sinus. Uncomplicated CSF fistulas (n=10), located at the anterior and posterior ethmoid roof and in the sphenoid sinus, were repaired using endoscopic approach. Postoperative success rate was higher (97% for intracranial approach, 100% for extracranial external and endonasal endoscopic approach) for all techniques. Anosmia was the most common permanent complication (n=5) after repair using craniotomy.

Conclusion: Endoscopic endonasal approach was the preferred technique for the closure of uncomplicated CSF fistula, located at the anterior or posterior ethmoid roof and in the sphenoid sinus. Neuronavigation is helpful for the determination of fistula site. Uncomplicated CSF fistula, located at the posterior wall of frontal sinuses can be repaired extradurally using osteoplastic frontal sinusotomy. Intracranial microsurgical approaches should be reserved for more complicated fistula which results from extensive comminuted fractures of the anterior skull base.

Keywords: Rhinorrhea, Surgery, Cerebrospinal fluid, Endoscopy, Craniotomy

EP-0865 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Operative Management of a Traumatic Superior Sagittal Sinus Injury in a Resource-Limited Civilian Field Hospital During the Syrian Civil War

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Traumatic dural sinus injuries following penetrating brain injury are rare but are often associated with significant morbidity and mortality. The management for significant defects is operative and can be challenging. In modern civilian practice, patients with these injuries typically receive extensive preoperative investigation and advanced perioperative monitoring. We report the case of successful operative management in a frontline civilian field hospital of a 33 year old man who sustained a shrapnel injury to the superior sagittal sinus during the Syrian Civil War. The injury was to the junction of the middle and posterior thirds of the superior sagittal sinus and was repaired successfully with a polytetrafluoroethylene (PTFE) graft. The postoperative course was uncomplicated. Anticoagulation was commenced 2 days post-operatively. The patient was discharged 5 days postoperatively with a GCS of 15 and mild weakness of the limbs bilaterally. We conclude that immediate repair of dural sinus injuries is feasible in the context of a low-resource wartime environment and should be attempted without delay. Furthermore, to our knowledge, this is the first case of successful use of a synthetic vascular graft for repair of a dural venous sinus injury reported in the literature.

Keywords: Damage control neurosurgery, Traumatic brain injury, Rural surgery

EP-0866 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Chronic Subdural Hematomas - Reducing the Incidence of Recurrence and Obtaining the Optimal Results**

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Background: Chronic subdural hematomas are among the commonest entities of neurosurgical pathology and are considered to be one of the “easiest” operations. Nonetheless hugely different results have been observed among different surgeons. Why? And what could be done to obtain the optimum results?

Method: In a multicenter study we assessed the results, complications and rate of reoperation for a number of surgeons, and tried to identify the differences in technique that would justify these differences in results. The specialists group (Gr. A) consisted of 114 patients (Mean age 76,2, Mean GCS preop 10,7) and the Non-specialists group (Gr.B) consisted of 427 patients (Mean age: 75,4, Mean GCS preop: 11,1).

Results: For group A survival was 98,2%, rate of complications was 10,5% of which recurrence 6,65%. For group B survival was 93,6%($p<0.01$), rate of complications was 24,1% ($p<0.001$) of which recurrence 20,13% ($p<0.001$) and the main difference in technique was membranolysis.

Conclusion: The obvious reasons for recurrence are membranes that do not allow the brain to expand. The experienced surgeon can dissect these through the burrholes and thus vastly reduce the recurrence rate by more than 50%. Although impressive, this should not be done by unattended young registrars due to severely increased risk of bleeding and sequelae.

Keywords: Chronic subdural, Membranes, Optimal

EP-0867 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Surgical Treatment of Supra and Infratentorial Traumatic Epidural Hematoma: Our Experience and Literature Review**

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Background: Supra and infratentorial acute epidural hematoma (SIEDH) is an uncommon type of epidural hematoma. SIEDH can often be rapidly deteriorating, causing a sharp rise in intracranial pressure that leads to a lifethreatening foramen magnum herniation. The authors present their experience in the surgical management of SIEDH, including one case of bilateral SIEDH.

Method: In the last 15 years, 14 patients with SIEDH including one bilateral case, were treated in our Institute. In all patients the hematoma caused mass effect with partial or total obliteration of the perimesencephalic cisterns and compression and/or displacement of the fourth ventricle associated to neurological deterioration. The

hospital records of these patients were analyzed retrospectively.

Results: The source of hematoma are: venous sinus detachment (7 cases), meningeal blood vessels leakage (2 cases), and a fracture line across the transverse sinus (4 cases). 13 patients underwent to combined suboccipital and supratentorial craniotomies leaving a bone bridge outside the transverse sinus and one patient had a bilateral simultaneous approach. No surgical complications occurred.

Conclusion: Our study indicates that a combined suboccipital and supratentorial approach is as effective for the management of SIEDH. Then, we present a very rare case of bilateral supra and infratentorial extradural hematomas that required simultaneous bilateral approach. To the best of our knowledge, this is the first case reported in literature

Keywords: Supra and infratentorial acute epidural hematoma, Suboccipital and supratentorial approach, Venous sinus rupture

EP-0868 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Efficiency of Surgical Treatment of Traumatic Subdural Hygroma**

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Aim: To determine the efficacy of surgical treatment of traumatic subdural hygroma (TSH).

Method: A retrospective analysis of 11 cases of surgical treatment of TSH in 1995-2016 was conducted. The ratio of male and female was 5.5:1. The average age was 61±8 years. According to CT and/or MRI studies, the thickness of the hygroma was in average 11±3 mm, the displacement of the median structures in average 6±3 mm. Indication for surgical intervention was the presence of persistent and/or increasing symptoms. Operative intervention was carried out on average 16±7 days. In 8 cases, the hygroma localized in the frontal region (of which 5 cases were bilaterally), frontal-temporal localization – 3 cases.

Results: In 5 cases, surgical intervention was performed by burr hole and external drainage for 48-72 hours. In 2 cases, due to the recurrence of the hygroma, a subdural-peritoneal shunting was performed. In 6 cases due to a thicker hygroma more than 10 mm, a subdural peritoneal shunting was performed. In 3 cases with two-sided localization of the hygroma the subdural spaces were connected to each other through a separate drainage tube and subdural-peritoneal drainage was carried out from one of the burr holes. In all cases, a positive clinical and neuroimaging effect was noted. In 2 cases, after 3 months, the shunting system was removed without recurrence of the hygroma.

Conclusion: The most effective and reliable method of treatment of traumatic subdural hygroma at a thickness of more than 10 mm is subdural-peritoneal drainage.

Keywords: Traumatic subdural hygroma, Classification, Subdural-peritoneal drainage

EP-0869 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Efficiency of Conservative Treatment of Chronic Subdural Hematoma

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Aim: To determine the safety and efficacy of conservative treatment of chronic subdural hematoma (CSH).

Method: Retrospective analysis of 29 cases of conservative treatment of CSH was carried out. Mild head injury was indicated in 21 cases, could not indicate an episode of trauma – in 8 patients. The ratio of male and female was 3:1. The average age was 56 ± 7 years. State of patients by Markwalder Grading Scale was grade 1-2. According to CT and / or MRI studies, the thickness of the hematoma (TH) was in average 9 ± 1.5 mm, the displacement of the median structures (DMS) in average 7 ± 2 mm). Indication for conservative therapy was a compensated condition, a high risk of surgical treatment, patients refusal from surgical treatment, absence of diabetes mellitus and hard-to-control arterial hypertension, absence of contraindications to the administration of steroid therapy, tranexamic acid. The efficacy of the treatment was assessed by clinical improvement and MRI data. The indication of continuation of the course of conservative treatment was a clinical improvement, a decrease DMS and/or TG. MRI was performed every 3-4 weeks.

Results: The positive effect of the treatment is noted in 28 cases. In one case (3.4%), due to non-compliance with the dexamethasone treatment regimen, surgery was required. The decrease in the displacement of the median structures of the brain was noted 2-3 weeks after treatment. Resolution of the hematoma was observed after 3-8 (in average 6 ± 0.5) weeks.

Conclusion: More rapid effect was obtained with the treatment of dexamethasone.

Keywords: Chronic subdural hematoma, Conservative treatment, Treatment effectiveness

EP-0870 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Calcified Chronic Subdural Hematoma (CCSH): Report of Two Cases

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Calcification of hematoma is seen too rarely although chronic subdural hematoma (CSH) is a well-known. We present two cases with calcified subdural hematoma. 35 years old female who admitted to our hospital with a complaint of epilepsy and 58 years old male who was diagnosed as calcified subdural hematoma incidentally. We did not observe deficit in both of our patients following operation and discharged them at the postoperative 3rd

day with recommendation of antiepileptic therapy.

Keywords: Calcified chronic subdural hematoma, Craniotomy, Treatment

EP-0871 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Decompressive Hemicraniectomy and Intractable Intraoperative Brain Herniation: The Use of a Plastic Sheet, Resembling a Bogotá Bag, for Temporary Scalp Closure

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Decompressive craniectomy with duraplasty is an alternative procedure for the treatment of persistent elevated intracranial pressure, when optimized medical therapies have failed. Ultimately the skin edges are easily reapproximated. We describe four cases of a huge intraoperative brain swelling that was refractory to standard measures and the temporary augmentation of the scalp with a sterile plastic sheet. The authors present four cases of decompressive hemicraniectomy with durotomy, two for the treatment of traumatic brain swelling with midline shift to the right side (a 21 year-old male, and a 7 year-old boy), and two for left-sided malignant middle cerebral artery ischemic stroke (51 year-old, and 44 year-old, both males) with the development of massive intraoperative brain herniation. The duraplasty was performed, but the primary skin closure was precluded. Thus, in order to provide an augmentation of the scalp, a sterile plastic sheet was sewn to the skin edges with running suture, and no brain tissue was surgically removed. The use of a plastic sheet to provide skin augmentation, resembling a Bogota bag, in the face of massive brain herniation during decompressive craniectomy may be considered a viable option, including the preservation of potentially functioning brain tissue.

Keywords: Decompressive craniectomy, Brain herniation, Scalp closure, Plastic sheet

EP-0872 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Ball and Socket Technique for Fixation of Cranioplasty Flaps

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Background: Cranioplasty, defined as the surgical repair of a defect in the cranium, has undergone many revolutions over time to improve patient prognosis. Cranioplasty offers cosmetic and protective benefits for patients with cranial defects. Background: A new method for the fixation of poly-methyl methacrylate (PMMA) cranioplasty flap is described, and the results of the technique were reported.

Method: Twenty six patients with different pathologies requiring

cranioplasty were included in the study. Patients were followed up by clinical examination and periodic radiographic studies for a minimum of 6 months (range 6 to 12 months). Cosmetic appearance and solid fixation of the cranioplasty flap were evaluated.

Results: Cosmetically good solid cranioplasty flaps occurred in all patients. No mesh, wires, miniplates or sutures were required. There was no occurrence of infection or implant extrusion in any of the patients.

Conclusion: This technique appears to be a simple, safe, economic and efficient method for PMMA cranioplasty flap fixation in reconstruction of significant calvarial defects.

Keywords: Cranioplasty, Ball and socket, Technique

EP-0873 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Techniques for Removing Hundreds of Little Balls and Penetrated Wood Sticks Caused by Grinder Explosion and Reconstruction of Skull Base

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Penetrating head trauma is a life-threatening situation. Grinders are widely used for cutting hard metals either in industry or in daily life. Grinders are high speed machines with its important protection covers. Using grinders without their protecting covers may lead to severe penetrating head traumas. We present a 46 years old workman who referred to our institutions emergency department with a penetrating head trauma caused by a grinder. Glasgow Coma Scale was 7 and CT scans revealed maksillofacial, orbital, anterior skull base and frontoparietal penetration of hundreds of little balls spreaded after grinder explosion and long hard wooden sticks stuck into brain parenchyma. We recommend that the most predictive issue is major vessel injury regardless of skullbase involvement or severity of brain involvement. The patient recovered with only a mild hemiparesis and satisfactory cognitive tests. We discuss the surgical techniques and predictive issues for the outcome of grinder head trauma.

Keywords: Grinder, Head, Trauma, Penetrating

EP-0874 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Interhemispheric Subdural Hematomas

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Background: Acute subdural hematomas (SDH) occur most commonly over the hemispheric convexities. The literature reports traumatic SDH in the inter-hemispheric space as uncommon and difficult to manage. Our aim is to retrospective review of traumatic IHSDH to: determine the incidence, clinical presentation; and management.

Method: Patients admitted over a period of 4 years to a level I trauma center with a diagnosis of traumatic SDH were reviewed. Data such as age, gender, mechanism of injury, associated intracranial injuries, size of hematoma, Glasgow Coma scale score, neurological deficit

related to the IHSDH, injury severity score were collected. The management (conservative or surgical) and outcome (Glasgow outcome scale score) was recorded.

Results: Total of 1750 patients were reviewed and 1182 cases had acute SDH on the initial CT, amongst which 420 patients had acute inter-hemispheric subdural hematoma (24%). Many had convexity or tentorial SDH associated with the IHSDH. The majority of patients did not need surgical treatment for IHSDH. Surgical drainage was required in only two patients (0.5%); both had a good outcome.

Conclusion: Acute IHSDH is a common entity: one in four patients admitted with subdural hematoma has an IHSDH, either isolated or associated with SDH in other locations. The great majority do not require surgical drainage. Exceptional cases that develop focal neurological deficit may benefit from surgery. However, this benefit should be weighed against the potential risks of surgery, including damaging cortical veins, with more bleeding or venous infarction. Therefore, conservative approach should be undertaken in managing most of these patients.

Keywords: Subdural hematoma, Inter-hemispheric, Superior sagittal sinus

EP-0875 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Clinical Manifestation and Tactics of Treatment of Chronic Subdural Hematoma

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We observed 49 patients hospitalized in the our clinic for the period from 2008 to 2016. All these patients were operated using minimally invasive surgery, including washing the cavity of the hematoma and controlled closed external drainage through the milling hole in the passive mode. Our aim is to compare the effectiveness of the surgical methods used, we conducted a retrospective analysis of 43 patients with CSH who were in the clinic during the period 1998-2002, and who were used to remove CSH bone-plastic, resection or decompressive trepanation of the skull. Comparison of the results of CSH treatment with minimally invasive (2009-2016) and radical (1998-2002) treatment methods convincingly proves the effectiveness of the latter. If after the application of minimally invasive operations, only 6 (12,3%) cases were reopened, recovery was noted in 42 (85,7%), 1 (2,0%) died, then repeated operations after radical operations were required In 17 (39,5%) cases, recovery was noted in 31 (72,0%) patients, 2 (4,5%) died. Thus, it can be concluded that with CSH, there is a predominance of cerebral symptoms over focal in young and middle age, an increase in the role of the vascular factor, intracranial hypotension in elderly and senile age. Comparison of the results of treatment with CSH between radical and minimally invasive methods conclusively demonstrates the effectiveness of the minimally invasive method.

Keywords: Subdural, Hematoma, Minimally invasive

EP-0876 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Basal Cisternostomy - Another Step in Reducing ICP in Severe Head Injuries. Newer Thoughts and Analysis**

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Basal cisternostomy involves microsurgical opening of the cisterns (Inter optic, Carotico optic, carotico third nerve and infratentorial pre medullary and pontine) by opening the subarachnoid layers and Lilequist's membrane thus letting out the locked up CSF. This procedure instantaneously reduces the ICP and also relaxes the brain parenchyma, thus reducing the secondary insult to cerebral cells. In our centre we have done 24 cases as an additional step along with other procedures. Most of our patients were operated after elective ventilation in intensive care following subsequent follow-up CT brain except in 2 patients where they were operated immediately following admission and first CT scan of brain. There was one death and 2 patients who discontinued further management at request. Patients who were in low GCS (less than 8) at the time of admission with significant cerebral contusions improved but delayed when compared to those who had moderate GCS (GCS 8 to 12). Cisternostomy alone was done in 6 cases and Decompressive craniectomy in other cases. Two patients had developed hydrocephalus and shunt was done in one patient. Technically cisternostomy on admission is more challenging than when done after a period of ventilation. Microsurgical expertise and experience is essential to do this procedure. In our experience we found the recovery is better when cisternostomy is added in the surgical management of increased ICP in head injuries.

Keywords: Cisternostomy, Intracranial pressure, Head Injury

EP-0877 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Emergency Minimally Invasive Surgery for Spontaneous Intracerebral Haemorrhage**

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Background: Current practice surgical indication: superficial haemorrhage, worsening neurological status, clot volume between 20-80 ml, haemorrhage causing midline shift, cerebellar haematomas >3 cm or causing hydrocephalus. More than 50% of patients die and half of the survivors are left severely disabled. The aim of this study is to summarize our experience with the surgical treatment and our approach to Spontan intracranial hematomas.

Method: We analyzed the clinical data of 4 patients with SICHs who were treated at the Our Clinic. between October 2013 and January 2015, including age, gender, diagnosis, treatment, and outcomes. Patients presenting with primary supratentorial haemorrhage fulfilling inclusion criteria are included in the study. Extensive Decompression craniotomy as minimally invasive; without retractor, with microscopic surgical approach done in all the patients.

Results: Mean age of presentation was 51.2 years, ranging from 34-71 years. Male 1, female 3. Three patients with GCS >7 whereas

only one patients with Glasgow coma scale (GCS) ≤ 7 . All the patients had superficial haemorrhage. One elderly patient was ex. 2 patient was good outcome surgery, no neurological deficit, 1 patient was minimally motor deficit.

Conclusion: Emergency Extensive Decompression craniotomy as minimally invasive; without retractor, microscopic evacuation of the hematoma could be a feasible option in between 40 ml to 80 ml of Primary STICH without intra-ventricular extension. Midline shift of 5 mm or more might be a poor prognostic factor.

Keywords: Minimally invasive, Spontaneous, Intracerebral haemorrhage

EP-0878 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**Single Parietal Burr Hole Craniostomy for Unilateral Chronic Subdural Hematoma in Young Adults Less than 40 Years**

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Background: Chronic subdural hematoma (CSDH) is one of the most common neurosurgical conditions. Being mostly a disease of elderly population very little data is available about the young patients. Surgical method is also a matter of debate leading to lack of uniformity about the treatment strategies, such as the role of burr hole (single or double), twist drill, craniotomy.

Method: We performed a study of young patients undergoing single burr hole craniostomy (SBHC) for unilateral chronic subdural hematoma at our institution between January 2013 to December 2016. Medical records were assessed based on patient characteristics, aetiology, presenting symptoms, comorbidities and clinical examination, CT brain findings.

Results: Mean thickness of SDH 14.72 mm and mean midline shift was 10.96 mm. Trauma was the most common etiology (93.10%) with most common presenting complaint being headache (87.93%) followed by vomiting, paresis being rare. On CT scan most of the patients were having SDH thickness between 11-20 mm with midline shift of 6-10 mm. There were total 2 recurrences out of 58 cases.

Conclusion: Young patients with CSDH present with features of raised ICT early during the course compared to elderly. SBHC with irrigation and drainage has excellent result for unilateral CSDH in young adults which is comparable to any other method of surgery.

Keywords: Single burr hole craniostomy, Chronic subdural hematoma, Irrigation and drainage

EP-0879 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]**A Rare Case of Penetrating Trauma**

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Penetrant non-fire foreign body injuries are less common than

firearm injuries and 0.4% of head trauma. In this writing, operation technique and intervention were interviewed in a literal light after penetration trauma to the head of the iron rod. At the age of 42, male patient was brought to our emergency department as a result of iron ingestion. On physical examination, 2 meters in length and 2 centimeters in diameter were seen passing through the right mandible, right orbit. While the patient was being monitored under sedation, a fire brigade was called and the iron rod was cut from the nearest cranial part to prevent a swing by using electric iron cutter. The patient was operated under general anesthesia. Before the iron was moved, we opened the skin incision by linearly following the skin texture of the iron in the frontal area. Subsequently, the craniectomy was removed 2 cm laterally from the intact touch of the iron. The iron under the right mandible was slowly pulled down to the caudal direction. After the operation the patient was awakened on the 10th day. On the day 40, the patient was discharged naturally from the neurological examination except for the enucleation in the right eye. Patients with frontal lobe penetration continue only with personality changes like Phineas Gage. The shortest route within the parenchyma should be preferred for the object's removal. When this technique is preferred, localization of object inlet and outlet holes, eloquent region and neural tissues, vascular structures should be considered.

Keywords: Iron rod, Penetrant head trauma, Phineas gage

EP-0880 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

To the Question of Clinical Features and Treatment of Chronic Subdural Hematomas

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Aim: To define characteristics of the course, evaluate the effectiveness of surgical treatment of chronic subdural hematomas (CSH). This is a retrospective review of case records, imaging and operative records.

Method: 35 patients with a diagnosis of CSH operated in Department of Neurosurgery of I Clinic of Samarkand State Medical Institute in the period 2012-2015. Computed tomography and magnetic resonance imaging studies were performed.

Results: Headache was observed in 26 (74.3%) patients, weakness in the limbs - 22 (62.9%), nausea - 23 (65.7%), vomiting - 19 (54.3%), dizziness - in 18 (51.4%). In 13 (37.1%) patients noted loss of memory, in 8 (22.9%) - epileptic seizures. Speech disorders in the form of motor aphasia revealed in 4 (11.4%), sensory aphasia - 3 (8.6%) cases. Hemiparesis determined in 19 (54.3%), monoparesis in 3 (8.6%), tetraparesis in 4 (11.4%) cases. Central facial nerve paresis was observed in 26 (74.3%) patients. In all cases, CSH has been removed by minimally invasive method (imposition of burr holes and draining the contents of the capsule). Number of burr holes depends on size and location of hematomas. After hematoma removal inflow-outflow system was set to 13 (37.1%) patients, vinyl chloride tube to 12 (34.3%) and rubber drainage to 9 (25.7%) patients. Recurrence of CSH were not observed in postoperative period.

Conclusion: Thus, minimally invasive surgical removal of CSH

is effective method, which contributes decreasing of neurological symptoms in postoperative period.

Keywords: Hematomas, Hemiparesis, Aphasia, Minimally invasive

EP-0881 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Supraorbital Trans-Sulcal Endoport Assisted Evacuation of Basal Ganglia Hemorrhage: A Technical Note

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Background: Basal ganglia hemorrhages are a large source of morbidity and mortality. Despite multiple attempts at developing treatment strategies, outcomes have remained poor. Recent minimally invasive approaches for hematoma evacuation while preserving surrounding brain have been developed in an attempt to try and improve outcomes. This article discusses our technique using a tubular endoport system as well as our outcomes in our first three patients.

Method: We collected data pertaining to the first three patients with basal Ganglia hemorrhage who underwent minimally invasive evacuation using an endoport assisted tubular retraction system. We collected basic demographics, hemorrhage parameters, and admission data.

Results: All hemorrhages were hypertensive in etiology. The mean age was 49 with a female to male ratio of 2 to 1. Median hematoma volume on presentation was 54 cm³ and the median post operative residual volume was 4.45 cm³. Preoperative GCS was less than 8 in all cases and improved to at least 11 in all cases at time of discharge. All patients were extubated without the need for a tracheostomy, however all required gastrostomy tube placement for feeding.

Conclusion: Our technique demonstrates a minimally invasive endoport approach to the hematoma cavity in deep seeded hemorrhages. Our small series suggests the potential for improved outcomes in these patients, however larger series and potential clinical trials will need to be conducted to evaluate for true benefit.

Keywords: Endoport, Basal ganglia, ICH, Minimally invasive

EP-0882 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Literature Review on Skin Complications After Decompressive Craniectomy - How to Prevent It?

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Decompressive craniectomy is a well-known neurosurgical procedure, initially applied in trauma context and posteriorly used in malignant hemispheric infarction. It can be lifesaving although the own nature of brain trauma or occlusion of middle cerebral artery is devastating. The patient usually survives, but damage secondary to the primary incident seldom improves. Many scientific articles emphasize the importance of this surgery in present day, once most

of the times craniectomy is the only way to decrease intracranial pressure rapidly avoiding complications caused by intracranial hypertension. Literature review was made in order to understand scalp anatomy and irrigation, verify details about decompressive craniectomy that could influence wound complications and gather scientific articles on this subject. Decompressive craniectomy is performed through scalp “inverted question mark” or T-shaped incision. The advantage of the later over the first one is less dependence of temporalis superficial artery which can be accidentally damaged during surgery. Undermining the galea and creating small incisions in the galea provides additional elasticity to the scalp, reducing wound tension. Wound complications can lead to infection caused by *S. Epidermidis*, meningitis and consequently higher morbidity and mortality rates. In order to try to prevent wound complications, it is important to understand scalp anatomy and irrigation. Reducing wound tension through small incisions in the galea to provide elasticity to the skin and/or suturing the galea and using running suture with Monocryl 4-0, can improve scalp cicatrization.

Keywords: Decompressive craniectomy, Wound dehiscence, Wound complication

EP-0883 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

The Study of the Effectiveness of Endolumbal Ozone-Nootropic Therapy in Post-Traumatic Vegetative States

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Aim: To evaluate the effectiveness of endolumbal ozone-nootropic therapy for patients in the vegetative state (VS).

Method: Under the supervision of the our clinic from 1992 to 2016, there were 15 patients in the VS after a severe TBI (children-9, adults-6). In accordance with the goal, the patients were divided into 2 groups. Patients 1st group (2 children, 2 adults) intravenously injected nootropic drug pyracetam at a dose of 8-12 g/day. Patients of 2nd groups (7 children, 4 adults) underwent endolumbal insufflation (EI) of ozone in combination with pyracetam. Here is a clinical example: Patient P, 5 years old. Received a severe TBI. On the 26th day after the operation, the patient’s consciousness passed from a coma to a sopor, then to the sun and in this condition was treated in the intensive care unit for 80 days without positive dynamics. In the postoperative period on the 9th and 15th day, a lumbar puncture was performed with EI of ozone and pyracetam. After the second manipulation, the patient began to come into contact, answer questions, follow instructions. At present, the patient’s consciousness is clear. The patient is currently studying at a pre-school educational institution, knows how to count, recites verses by heart, performs simple mathematical exercises. Mental development has improved.

Conclusion: Thus, the presented results show that endolumbal ozone-nootropic therapy has a positive effect on the recovery of higher neurological and mental functions in patients, especially in children with severe TBI complicated by VS.

Keywords: Vegetative state, Endolumbal insufflation, Ozone, Pyracetame

EP-0884 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Cervical Pseudomeningocele-Induced Hydrocephalus Following Traumatic Brachial Plexus Injury: A Case Report

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49-year-old man who sustained a left brachial plexus injury and traumatic brain injury after a motor vehicle accident and subsequently developed a giant left cervical pseudomeningocele. The patient suffered multiple fractures in the cervical and thoracic ribs, transverse processes and the scapula. Physical examination revealed a giant left supraclavicular mass restricting his ability to turn his head ipsilaterally, with head tilted to the right, consistent with complete plexus avulsion. Neurological examination showed progressive muscular atrophy and a positive Tinel’s sign and paresthesias of the left hand. MRI and CT revealed a giant cervical pseudomeningocele. Left hemilaminectomy and partial medial facetectomy were performed for an extradural repair of the cyst. Three days later, the pseudomeningocele recurred; C6-T2 cervical laminectomy and a combined intra- and extradural repair of CSF leak with tensor fascia lata graft were performed. One day after the second surgery, the patient developed acute communicating hydrocephalus (CH) with progressive neurological decline. Ventriculoperitoneal shunt placement successfully resolved neurological symptoms associated with CH. The patient continued receiving treatment for neuropathic pain and spasms in the left upper arm at one-year follow up. We present one of the few documented cases of acute CH after a successful repair of a giant cervical pseudomeningocele. It is important for physicians to be aware of changes in CSF flow dynamics that occur in patients with traumatic brain injury. A repair of a large chronic pseudomeningocele can lead to acute CH in patients and cause rapid neurological decline.

Keywords: Cervical pseudomeningocele, Acute hydrocephalus, Traumatic brachial plexus injury

EP-0885 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Treatment of Basal Liquorrhea in Patients with Craniofacial Injuries with Using of Different Combinations of Plastic Materials

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Aim: To estimate immediate and long-term results of surgery, using different combinations of plastic materials.

Method: We do analysis of 74 patients with severe craniofacial trauma, complicated with nasal CSF leak. The age of patients ranged from 20 to 63 years. On admission to hospital, we divided all patients, into groups according to scale FOUR. Methods included preoperative neurological examination, determination of glucose concentration in the discharge from the nose, computed

tomography of the brain, CT cisternography. Quality of life after the injury assessed by the Glasgow Outcome Scale.

Results: In case of craniofacial trauma, complicated by CSF leak, fractures of the skull base often met at the level of the cribriform plate and the roof of ethmoid cells (51.5%), in 27% of cases at the level of the posterior wall of the frontal sinuses, the upper wall of the orbital cavity -19.5%, and planum sphenoidale 2%. 35 patients were operated in the acute period (26.9%). 39 patients (30%) underwent transcranial extradural repair of dura and skull base in the delayed period.

Conclusion: We use the combination of periosteal flap + TachoComb + "ElastoPHB" in 14 patients and there are no recurrence and complications in this subgroup. When using a combination of fatty tissue + TachoComb with fibrin-thrombin glue and fat tissue + TachoComb+ fascia lata there were recurrent liquorrhea respectively at 2 and 4 patients, 16.7% and 36.4%, respectively.

Keywords: CSF leakage, Skull base injury, Plastic materials

EP-0886 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Posttraumatic Hydrocephalus – An Indication for Neuroendoscopic Surgery?

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Background: In contrary to the bulk flow theory new theories provided theoretical background that supports successful neuroendoscopy in patients with hydrocephalus types that were thought unsuitable for neuroendoscopic treatment, including posttraumatic.

Method: Group of patients: From 130 hydrocephalic patients after neuroendoscopic surgeries operated on from 2005 to 2013 there were 11 patients with posttraumatic hydrocephalus (8 males, 3 females, average age 58,9 years), from them 2 subacute (development 3 days – 3 weeks postinjury) and 9 chronic cases (development more than 3 weeks postinjury). Clinical outcomes were analyzed using the Glasgow Outcome Score (GOS). The success rate (shunt free, GOS 4 or 5) of endoscopic third ventriculostomy (ETV) was studied.

Results: In 9 patients (8 chronic hydrocephalus), ETV was sufficient for hydrocephalus control. In 7 of the 9 cases (77.8%), the final outcome was GOS 4 or 5. In the remaining 2 patients, the outcome was fatal (primary brain damage, polytraumatism). In 2 patients, ETV failed to control the clinical symptoms, and ventricular dilatation and shunt implantation was required (one case with extensive posttraumatic subarachnoid hemorrhage - GOS 5 after shunt, one case with extensive frontal haemorrhagic contusions with progressive ventricular dilatation despite ETV, GOS 3 after shunt).

Conclusion: The results of neuroendoscopic surgery in posthaemorrhagic hydrocephalus are encouraging and are supported by the hydrodynamic concept of hydrocephalus. Massive SAH affecting basal cisterns with subsequent scarring reducing intracranial compliance and extensive brain injury are limiting factor for ETV success.

Keywords: Posttraumatic hydrocephalus, Hydrodynamic theory, Neuroendoscopy, ETV

EP-0887 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

The Influence of Decompressive Craniectomy on the Development of Hydrocephalus: A Literature Review

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Decompressive craniectomy (DC) is widely used to treat intracranial hypertension following traumatic brain injury (TBI) or cerebral vascular disease. Many studies have discussed complications of this procedure, and hydrocephalus is a common complication of DC. To further evaluate the relationship between DC and hydrocephalus, a review of the literature was performed. Numerous complications may arise after DC, including contusion or hematoma expansion, epilepsy, herniation of the cortex through a bone defect, CSF leakage through the scalp incision, infection, subdural effusion, hydrocephalus and "syndrome of the trephined". Several hydrocephalus predictors were identified; these included DC, distance from the midline, hygroma, age, injury severity, subarachnoid or intraventricular hemorrhage, delayed time to craniotomy, repeated operation, and duraplasty. However, results differed among studies. The impact of DC on hydrocephalus remains controversial.

Keywords: Traumatic brain injury, Hydrocephalus, Decompressive craniectomy

EP-0888 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Endoscopic Removal of a Bullet Migrated to the Third Ventricle Causing Hydrocephalus: A Case Report

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Hydrocephalus caused by an intraventricular bullet is a rare event. We report a case of a man aged 66 years who was admitted to hospital after a suicide attempt with gunshot to the head. The bullet migrated from the frontal parenchyma to the 3rd ventricle 4 days later. On the 21st day of admission, the patient developed hydrocephalus with obstruction of aqueductus cerebri. The bullet was then accessed through an endoscopic third ventriculostomy and removed using an endoscope. This is the first case in the literature of foreign object removal from the ventricle via a transcortical endoscopic approach. Hydrocephalus may develop in patients with intraventricular foreign objects. When such objects are required to be removed, the endoscopic approach is a safe, efficient, and a minimally-invasive procedure.

Keywords: Endoscopic removal, Intraventricular bullet, Hydrocephalus

EP-0889 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Outcome of Single Burr Hole and Subdural Catheter Placement in Chronic Subdural Hematoma in Terms of Improvement of Glasgow Coma Scale

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Background: Surgical treatment options for chronic subdural hematoma consist of placing two burr holes and irrigating through and through with tepid saline until fluid runs clear, single burr hole with irrigation and aspiration, single burr hole drainage with placement of a subdural drain, twist drill craniostomy or formal craniotomy with excision of subdural membrane. Patients present with varying symptoms of headache, confusion, language difficulties, TIA like symptoms, coma, hemiplegia or seizures. In this study effectiveness of single burr hole and subdural catheter placement on improvement of Glasgow coma scale was studied.

Method: Total number of 50 patients with chronic subdural hematoma in 1 year interval underwent single burr hole and subdural catheter placement. Glasgow coma scale before surgery and after first, second and third post operative day was calculated.

Results: Mean age was 61.38 years. 42 males (84%) and 8 females (16%) were operated on. 3 patients were in pediatric age group ≤ 14 years. Interestingly 25 (50%) patient had left sided chronic subdural hematoma while 14 (28%) had right and 11 (22%) had bilateral CSDH. Pre operative Glasgow coma scale of 5, 9 and 36 patients was < 11 , 11-12 and 13-14 respectively. In patients with pre operative GCS ≥ 11 , GCS 15/15 was observed in 30, 12, 3 patients on 1st, 2nd and 3rd post operative day respectively. Out of 5 patients with GCS < 11 , 4 patient expired due to comorbid states and 1 remained static.

Conclusion: Single burr hole and subdural catheter is effective treatment for CSDH and in our study all patients with GCS ≥ 11 had GCS 15/15 on 3rd postoperative day

Keywords: Chronic subdural hematoma, Glasgow coma scale, Burr hole, Subdural catheter

EP-0890 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Surgical Treatment of Traumatic Posterior Fossa Epidural Hematoma

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Aim: To present clinical features, imaging studies, and surgical treatment outcome assessments of patients with traumatic posterior fossa epidural hematoma.

Method: We carried out a retrospective analysis 71 cases of patients with PFEDH who were admitted to the Cho Ray Hospital from 2011 through 2013. Based on clinical and head CT the patients underwent surgical.

Results: Regarding clinical features & CT. Factors such as age epidemiology are common in ages from 20-30 y. See more men and women with the proportion of male / female: 4/1. Causes of injury in CHORAY hospital in Vietnam we recorded realized mainly

because of traffic accidents accounted for 71.8%, the accident usually happened to a group of workers. In clinical we noted that patients hospitalized with a history of head injury or occipital region accounted for 100%. Occipital scalp bruising accounted 88.7%, H/A 64.8%, N/s vomiting 17/71 (23.9%), dizziness 7/71 (9.9%), otorrhea 4/71 (5.6%), neck stiffness 2/71 (2.8%) of cases. Most cases of our PFEDH starting surgical treatment with a minimum of 12ml hematoma, a minimum thickness of 1.3 cm. Evaluation result of surgical treatment GOS with a good recovery rate return to the normal activities accounted for 87.3%, moderate functional losing 8.5%, severe functional loss of 2.8%.

Conclusion: Using statistical methods, we noted factors affecting treatment outcomes include the following elements: GCS score at composing surgery, underlying intracranial surgery and MLS.

Keywords: Posterior fossa, Traumatic, Hematoma, Outcome

EP-0891 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

A Metallic Stent Placement for Trapped Ventricle Horn through Endoscope

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There is a trapped ventricle horn case undergoing endoscopic ventriculostomy, and a metallic stent was used during the operation to keep the stoma patency. The trapped ventricle horn was caused by an operation of a 60mm central neurocytoma located in his left ventricle. 40 days after the operation later, a trapped temporal horn occurred with progressively headache. CT scan showed the trapped temporal horn and paraventricular edema. An outflow stoma by endoscopic ventriculostomy with neuronavigation guiding was planned. As the stoma tended to narrow and closed again following the trapped ventricle horn collapsed, a stent was placed to prevent closure of the stoma. Because of the short length of stoma with large ventricular spaces in both sides, it led a risk that the catheter (V-P Shunt catheter, which is a soft and smooth catheter are usually used), might drop off or puncture into brain tissues. Therefore, a balloon-expandable stent was successfully used in place through the endoscope. The patient recovered well after the operation. a metallic stent placement for trapped ventricle horn through endoscope is an effective way for selected cases.

Keywords: Endoscope, Trapped ventricle horn, Metallic stent

EP-0892 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Gunshot Injuries to the Head and Orbit

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Aim: To analyze the effect of a surgical management on the

prognosis of patients who had penetrating gunshot injuries to the orbit and anterior skull base.

Method: Thirty-five patients (30 unilateral, 5 bilateral) who had penetrating gunshot injuries to the orbit and anterior skull base were analyzed. The wounds were mainly caused by shrapnel fragments or bullets. Craniotomy was the standard treatment in all patients. Investigated clinical features included GCS score on admission, the mode and the extent of brain injury, and the presence of an intracranial retained foreign body. The prognostic importance of complications such as infection, intracranial hemorrhage, cerebrospinal fluid leak, and epileptic seizures was also investigated.

Results: The outcome of 35 penetrating gunshot injured patients was as follows: death in 3 patients, vegetative state in 1, severe disability in 2, moderate disability in 2, and good recovery in 27 cases. Localization and extent of the injury and GCS score on admission were the most important indicator for good neurological outcome. The predictors for good visual outcome were type B, grade 1, zone I, and relative afferent pupillary defect-negative injuries. The predictors for poor outcome were type A, grade 5, zone III, and relative afferent pupillary defect-positive injuries.

Conclusion: The prognosis of the injury to the orbit and anterior skull base depends on the course of the bullet or shrapnel fragment and the interdisciplinary care is required for better clinical outcome.

Keywords: Gunshot, Orbit, Surgery

EP-0893 [Neurotraumatology and Neuro Critical Care » Surgical Technique (Incl. Neuroendoscopy)]

Late Developed Post-traumatic Chiari-Malformation Type I After 10-Year Traumatic Brain Injury

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Chiari-malformation type 1 (CM-1) is a severe neurological disease with downward herniation of tonsil with compression of brain stem and spinal cord. The etiology of CM-1 can be classified as primary and secondary. Primary CM-1 is well documented in the previous studies. Secondary CM-1 causes are trauma, post-operation scarring, neoplasms, lumbar shunting and others. For traumatic cause, there is no clear consensus regarding how trauma may play a role in the post-traumatic CM-1. Rare cases of post-traumatic CM-1 have been reported but there were no images to prove the possibility of pre-existing CM-1. Now, we reported a case of late developed post-traumatic CM-1 to illustrate the possible clinical presentation, progressive images findings and effective management after 10-year traumatic brain injury (TBI). A 28-year-old male suffered from severe TBI in 2004/01. He underwent decompressive craniectomy and cranioplasty. He had recovered well from that accident until 2013/12. In December of 2013, he developed progressive unsteady gait, headache, dizziness and dysphagia for 6 months. Brain MRI showed no evidence of hydrocephalus but cerebellar tonsil herniation 16.6mm below the foramen magnum was identified. Under the impression of symptomatic post-traumatic CM-1, he underwent suboccipital craniectomy, C1 laminectomy and duroplasty. The post-op conditions were uneventful and the clinical symptoms were subsided. Post-op MRI revealed regression of tonsillar herniation from 16.6 mm to 6.3 mm. Also, the cine flow MRI study showed

improved CSF velocity at level of foramen magnum. We illustrated a rare case late-developed post-traumatic CM-1 almost 10 years after TBI with successful treatment.

Keywords: Chiari malformation, Surgery, Traumatic brain injury

EP-0894 [Neurotraumatology and Neuro Critical Care » ICP]

Lesson Learn (The End of DC Scandal)

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After publishing of the results of RESCUE ICP in NEJM last September the question of DC has been reduced to only when and how, instead of doing it or not. It means the one of the scandals of modern medical science has been over, but we have to learn the lessons. We examine what was the main reasons of misunderstanding of the law of medical science. Why did the results show and why will they show such difference in studies, if we do it? The status around the death must not study by traditional scientific ways. The reason is simple. The death is not a scientific question it is a mystery. We will never know it. The status very close to death also very close to mystery. The science still very far to summarize exact consequence around the death. The pathological processes close to death can be analysed only by a hundred or thousand million unknown equations. If we fix only one or two or ten constant in analysing the results we probably make mistakes in our consequence.

We have to realise: the scientific world often does not consider enough the rule of bioethics which says, "In life threatening illness the scientific rationale for the treatment must be sufficiently strong that a positive result would be widely accepted. It is mandatory to apply this rule in life threatening emergency medicine.

Keywords: ICP, Decompressive craniectomy, Traumatic brain swelling

EP-0895 [Neurotraumatology and Neuro Critical Care » ICP]

Effects of Decompressive Craniectomy, Hypertonic Saline Solution and Mannitol on an Experimental Model of Cerebral Ischemia

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Background: Cerebral ischemia is a cause of serious morbidity and mortality. The present study aimed to evaluate effects of surgical and medical treatments, either alone or in combination, on infarction area in an experimental rat model of cerebral ischemia.

Method: Cerebral ischemia was created by right CCAO under anesthesia. Decompressive craniectomy (DC) was performed in the relevant groups at the 12th hour following CCAO, whereas medical treatments were performed in the relevant groups at the 1st, 12th, and 24th hours following CCAO. After CCAO, the control group received saline, hypertonic saline (HS) group received hypertonic

saline and mannitol (MAN) group received 20% mannitol. While only DC was performed following CCAO in the DC group, DC+HS group underwent DC together with hypertonic saline treatment and DC+MAN group underwent DC together with mannitol treatment. The rats were decapitated at the end of the 24th hour following ischemia. The ratio of infarction area to the total area of section was calculated as percentage.

Results: Mean infarction areas were 27.9% in the control group, 13.7% in the HS group, 15.1% in the MAN group, 10.6% in the DC group, 8.1% in the DC+HS group, and 9.7% in the DC+MAN group.

Conclusion: Both medical and surgical treatments were effective in decreasing cerebral ischemic infarction. There was no difference between medical treatments groups in terms of efficacy, whereas DC led to a substantial decrease in ischemic infarction volume as compared with the medical treatment groups. Combined treatment approaches performed to decrease infarction volume also resulted in favorable outcomes.

Keywords: Cerebral ischemia, Decompressive craniectomy, Mannitol

EP-0896 [Neurotraumatology and Neuro Critical Care » ICP] Proper Cerebral Perfusion Pressure of the Decompressive Craniectomized Patients with Traumatic Brain Injury

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Background: In the severe traumatic brain injured patient, decompressive craniectomy (DC) is an effective treatment option to decrease the increased intracranial pressure (ICP), however maintaining the cerebral perfusion pressure (CPP) at greater than 70 mmHg is the recommendation to improve clinical outcome. In patients who underwent DC surgery, ICP is typically lowered. These authors tried to determine whether the targeted CPP can also be lowered in patients with decompressive craniectomy (DC).

Method: This study included 199 patients who underwent DC for severe traumatic brain injury (TBI). All patients were monitored for ventricular ICP and blood pressure during and after the DC surgery. Cerebral perfusion pressure was calculated from the mean arterial blood pressure (mABP) minus ventricular ICP every two hours, for 3 days postoperative. Patient outcomes were evaluated with the GOS 6 months after surgery, neurologic outcome was analyzed compared to the initial ICP, ventricular ICP and CPP.

Results: The mean age was 49.1 years (median: 50 years) and male to female ratio was 157 to 42. Clinical outcomes positively correlated with CPP ($p=0.000$) and mABP ($p=0.000$) and inversely correlated with initial ICP ($p=0.003$) and postoperative ICP ($p=0.000$). The mortality rate was significantly increased with CPP values between 50 and 60 mmHg ($p=0.048$) compared to standard targeted CPP values of 70 mmHg.

Conclusion: From this study, TBI patients who underwent DC surgery, a targeted CPP might be lowered to around 60 mmHg, in DC patients with traumatic brain injury.

Keywords: Cerebral perfusion pressure, Decompressive craniectomy, Intracranial pressure, Outcome, Mean arterial pressure

EP-0897 [Neurotraumatology and Neuro Critical Care » Pediatric Neurotrauma]

Growing Skull Fracture of 2-Month-Old Age Patient

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Growing skull fracture (GSF) is a very rare complication following cranio-cerebral trauma, which occurs commonly in infants and young children and often is located over the calvarium, and accounts for 0.05-1.6% of all childhood fractures. This entity was also known as leptomeningeal cyst, traumatic leptomeningeal cyst and cranio-cerebral erosion. The most common site of these lesions is parietal region. GSF usually develops following linear fracture with underlying dural tear resulting in herniation of the brain. Early treatment is pivotal to prevent those complications. Nine months before 2-year-old female presented to our department with a history of injury due to fall from height. Due to injury patient suffered from fracture in midline parietoccipital bone. Then she presented with progressively enlarging swelling in the parietoccipital region. The swelling is soft in consistency, globular in shape, smooth surface, transilluminant. We saw growing skull fracture more than 4mm and scalp swelling. An operative decision was planned for the patient in the emergency settings. The patient was subjected for the midline sub occipital craniectomy with duraplasty using autologous pericranial patch. After the operation 4 months later, the patients remains asymptomatic. All the cases occurred in children aged between newborn and 4 years and 90.9% were below 3 years of age, half being below the age of 1 year. Early detection of growing skull fractures necessitated staging of skull fractures so that they can be treated early. The standard surgical treatment of GSF involves repair of the dural defect with a graft and cranioplasty.

Keywords: Growing skull fracture, Sequel of trauma, Cephal hematoma, Dural tear

EP-0898 [Neurotraumatology and Neuro Critical Care » Pediatric Neurotrauma]

A Challenge with Pediatric Neurotrauma Cases: Traumatic Pediatric Carotid Artery Dissections

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The authors present a case of a 3-year-old boy with a right temporoparietal lobe infarction that developed twenty hours after a fall from height. The first investigation done in the emergency department presented right occipital cranium fracture without any neurological deficit. In the following radiodiagnostic investigation for a progressive left sided hemiparesis, Magnetic resonance (MR) angiography showed narrowing of the right cervical internal carotid artery (ICA) indicative of a cervical carotid dissection. The treatment of traumatic carotid artery dissection in pediatric population remains a controversial issue. According to previous studies in adults, thromboembolism is the primary mechanism

of acute ischemic clinic in carotid artery dissection, and anticoagulation therapy is suggested for 3 to 6 months. However there are no algorithm presented for pediatric cases. The authors followed the patient for a week with fractioned heparin treatment (calculated according to weight) for twenty four hours and warfarin treatment for a following month. The patient had mild neurological deficit in 3 weeks control, even though the control MR-angiogram revealed very limited passage through the artery. In conclusion, Pediatric TCAD should not be missed in children with head and neck injuries especially with acceleration/ deceleration or rotational forces due to the unique biomechanical properties of the pediatric cranio-cervical junction and mobility of the neck.

Keywords: Traumatic carotid dissection, Pediatric, Management

EP-0899 [Neurotraumatology and Neuro Critical Care » Others]

Unexpected Complications Encountered in Surgical Treatment of Chronic Subdural Hematoma -An Interesting Case Report

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Complication in Chronic Subdural Hematoma (CSDH) surgery is usually rare. Sometimes patients who underwent surgical treatment for CSDH develops complications like pneumocephalus, recurrent hematoma, subdural hygroma etc. We are reporting a case which had unexpected complications following CSDH surgical treatment.

Keywords: Tension pneumocephalus, Subdural hygroma, Craniectomy

EP-0900 [Neurotraumatology and Neuro Critical Care » Others]

Difficulties of Diagnosis of Bilateral Traumatic Intracranial Hematomas with Supratentorial Location

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Partial regression of symptoms such as "light" period was observed in 8 patients. At the opposite hemisphere 2 violations suffered symptoms began to clearly manifest only after the removal of the hematoma on the one hand. When differential diagnosis of injuries and compression of the brain are most informative paraclinical methods. However, the analysis of our data shows that in the interpretation of the data should bear in mind a number of features inherent in bilateral hematoma. Identified radiographic damage to the bones of the skull in the "typical" field oriented in favor of the hematoma. But such symptoms are rare. Fractures of the bones of the skull were found in 11 cases, including 6 at the location of the affected area branches of the external carotid artery. Severe condition of patients and the risk of brain dislocation limit the use of lumbar puncture. High informative method EchoEG in unilateral hematomas clearly reduced in the case of bilateral hematoma. Mixing of median brain structures revealed 2.5-4.0 mm in only 4 patients.

After the establishment of multislice computed tomography in 2 patients revealed bilateral subdural hematoma is removed in time. In this way, along with the general clinical data in the recognition of bilateral hematomas leading role played by paraclinical methods of investigation, but their figures are quite different from those of unilateral hematomas. CT imaging is a modern and informative method for intracranial hematomas.

Keywords: "Light" period, Bilateral, Hematoma

EP-0901 [Neurotraumatology and Neuro Critical Care » Others]

Epidemiology and Diagnosis Nosocomial Pneumonia in Patients with Craniocerebral Injury

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Aim: To analyze the features of the development, the etiology and treatment of nosocomial pneumonia (MP) in patients with severe cranio - brain injury (SBI).

Method: A retrospective analysis of medical records of patients admitted to the intensive care unit FFRNTSEMP for the period 2006-2007. A total of 33 patients with SBI varying severity were hospitalized in 2006, including 28 women, representing 84.8%, and 5 women (15.2%). In 2007, only 35 people were hospitalized, including 31 men (88.6% and 4 women (11.4%). The average age of patients was 44.3 ± 2.3 years.

Results: The condition of patients for complex diseases and GCS in all cases rated as severe. Special attention should be indicators of mortality of patients hospitalized with SBI. So in 2006 the figure was 18 cases or 54% of the total number of patients, and there was a decrease in this indicator to 45.7% in 2007, ie 16 cases out of 35 hospitalized.

Conclusion: 1) There are no clear idea of the significance of different diagnostic methods to identify NP, not the algorithm of diagnostic search in patients with suspected Hth; 2) The concept of Hth pathogens spectrum obtained in studies of ICU patients 'general' profile can not be fully transferred to patients with SBI. Moreover, even in various surgical settings spectrum microbial pathogens and antibiotic resistance have their own characteristics; microbial "landscape" ITD also varies in different hospitals.

Keywords: Pneumonia, Nosocomial, Brain injury

EP-0902 [Neurotraumatology and Neuro Critical Care » Others]

Features for Traumatic Brain Injury in Conjunction with Chest Damage

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Combined with TBI injury of the chest and its organs is traced in 45 patients in the emergency department of neurosurgery in the

Fergana branch of RSCEMA. Men were 38 (84%), women 7 (16%). Age of victims from 9 to 68 years. TBI prevailed in the clinical picture in 34 (76%) patients, chest trauma in 11 (24%). The most frequent cause of combined injuries were traffic accidents 40 hit. Falling from a height 5 patients were divided as follows: 22 patients with severe traumatic brain injury combined with severe thoracic trauma. 10 patients with mild to moderate traumatic brain injury combined with severe thoracic trauma. 13 patients with severe head trauma and mild chest trauma. Respiratory disorders as the most common complication of TBI and concomitant chest injury occurred in 36 patients. Of these, the direct damage to the lung tissue was observed in 32 of the 45 victims. In 14 patients after 3-5 days after receipt found pulmonary complications with the development of interstitial edema, posttraumatic pneumonia. The most difficult for TBI was 22 patients, which is due not only to severe head injury, and severe injury of the chest and its organs. In 4 patients made thoracostomy about hemopnevmotorax, in one case pneumothorax. In this way, damage to the chest adversely affect the course of a traumatic brain injury that caused by secondary brain damage in connection with what complicates timely diagnosis and removal of intracranial hematomas.

Keywords: Pneumotorax, Chest, Brain injury

EP-0903 [Neurotraumatology and Neuro Critical Care » Others]

A Case Report of Rod Migration into Cerebellum Through Occipital Bone After Lateral Mass Fixation of Cervical Spine

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We report on a rare case of connecting rod migration into the posterior cranial fossa after posterior cervical decompression and lateral mass screw fixation. A 58-year-old male patient who was operated on for cervical anterior discectomy and fusion for C3-4 level and posterior C3,4,5, posterior lateral mass fixation at another institution; complained of sudden-onset of vomiting and unsteady gait one year following surgery. CT scan showed migration of left-sided connecting rod into the cerebellum through occipital bone. The patient was operated on for rod removal and made excellent recovery and discharged home on post operative day 3. The clinician should be aware that superior rod migration is a rare but potentially disastrous complication. Regular follow-up with radiological evaluation should be done to look for implant loosening, migration, and non-union even in asymptomatic patients. The implant should be subsequently removed after it has served its purpose.

Keywords: Rod migration, Lateral mass screws, Cervical spine

EP-0904 [Neurotraumatology and Neuro Critical Care » Others]

Craniometry with Hematomas of the Posterior Cranial Fossa

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The posterior cranial fossa is formed by the occipital and two temporal bones, being an integral part of the base of the skull. The borders of the posterior cranial fossa are: in front - the base of the

back of the Turkish saddle, along the edges on both sides - the upper edges of the pyramids, behind - the sulcus of the transverse sinus of the occipital bone, from above - the cerebellar nest. At the present time, the developed formula was used to determine the volume of the DCF: $V = 1/3 S \times (b + c (a^2 + ae + e^2) / a^2)$, where $S = \pi ad / 4$; A - length, b-height of the cerebellum, e - longitudinal size of the occipital orifice, c- height, d - width. The volume of FFW was calculated as the sum of the volumes of two truncated cones. When analyzing the obtained craniometry data, we found that the dimensions of the RFI in the studies are from 110 cm³ to 218 cm³, an average of 158 cm³. The statistical deviation was 19.14. Thus, a hematoma of 25 cm³ for an AST in a volume of 140 cm³ is 18% and for a volume of 240 cm³-10%. The volume of the hematoma is not a direct indicator for surgical treatment, the indication for the operation is the ratio of the volumes of hematoma and DCW equal to more than 14%.

Keywords: The posterior cranial fossa, Hematoma, Traumatic brain injury

EP-0905 [Neurotraumatology and Neuro Critical Care » Others]

Compound Elevated Skull Fractures: A Case Series from South Africa and an Anatomical Classification

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Aim: To describe the clinical presentation, neuro-radiology findings, medical and surgical management, and complications of patients with compound elevated skull fractures at a busy Neurosurgical Department in Durban, South Africa.

Method: Retrospectively evaluated the medical records of patients admitted from January 2005 to December 2016 with compound elevated skull fractures. Data was analysed for demographics, clinical presentation, mechanisms of injury, neuro-radiology findings, management and outcomes.

Results: Twelve patients were included in series with a mean age of 30 years, average admission Glasgow Coma Scale of 12 and focal neurological deficit in eight patients on admission. Intra-cerebral haematoma was the most common associated intracranial haematoma [n=9, 75%]. Neuro-radiological images were assessed and elevated bone segment classified into three distinct types: Type 1 - fractured segment with minimal loss of contact with rest of cranial vault, Type 2 - fractured segment with partial loss of contact with rest of cranial vault, Type 3 - fractured segment with complete loss of contact with rest of cranial vault. All patients underwent surgery to debride and repair dura [n=11, 91%] when injured. Replacement of elevated bone was done in 50% of cases. With regards to outcomes, one patient demised whilst the remaining 11 patients had favourable outcomes at discharge (Glasgow Outcome Scale 4 or 5).

Conclusion: Compound elevated skull fracture is an additional subtype of skull vault fracture. Prompt neurosurgical management with appropriate operative management of dura and elevated bone fragment may reduce morbidity from septic complications and mortality from underlying brain injury.

Keywords: Compound elevated skull fracture, Skull vault fracture, Autocraniotomy

EP-0906 [Neurotraumatology and Neuro Critical Care » Others]

Disseminated Intravascular Coagulation Occuring Intraoperatively After Severe Head Injury

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Disseminated Intravascular Coagulation (DIC) is a well documented complication of Traumatic Brain Injury (TBI); although some authors reports that it can occur within the first 6 hours following injury, this is the first report of DIC occurring intraoperatively. We managed a patient who sustained severe traumatic brain injury following a stab on the left temporal region with a pocket knife. the patient baseline platelet was $147 \times 10^9/L$ and Prothrombin Time (PT) was 12. His level of consciousness dropped from 14 to 3/15 while in the accident and emergency room. he was intubated and scheduled for craniotomy for removal of a foreign body. Intraoperatively, during the operation, controlled removal of the knife was done and no major vessel were breached; however, patient suddenly developed severe epistaxis to the point of being transfused twounits of packed cells. Blood count taken immediately post operatively showed a decrease in the platelet count to 95 and a PT of 22. the incidence of intraoperative blood coagulation dyscrasia may be under-reported specially in the setting of a high burden of traumatic brain and spine injuries. a review of the litterature shows that it is a rare occurrence and the only reported cases are in the setting of craniotomy for tumors. Surgeons should be aware of the possibility of traumatic patients developing disseminated intravascular coagulation pre, intra and postoperatively. screening for DIC should be standard in trauma protocols for traumatic brain injury to avoid fatal intraoperative bleeds.

Keywords: Disseminated intravascular coagulation, Traumatic brain injury, Intraoperative

EP-0907 [Neurotraumatology and Neuro Critical Care » Others]

Traumatic Hypoglossal Nerve Paralysis

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Injuries to the hypoglossal nerve are rare. Mostly reported cases are the result of malignancy, trauma, infections, radiotherapy and surgeries which perform on neck region. We present isolated hypoglossal nerve injury after trauma. 45 years old female patient presented to our clinic with cervical strain, speech disorder complaints after car accident. In her physical examination, tongue movements were restricted. Tongue was deviated to right side. CT scan showed a fracture line which was reach out from clivus to right occipital condyle. After that, MRI was performed. Lineer fracture was caused seperation of occipital bone from right occipital condyle. Hypoglossal canal got irritated and also soft tissues at its perimeter was edematous. We observed the patient with anti-edema

treatment. She applied for control examination after 2 months. There was no change at her physical examination. Hypoglossal nerve injury should be considered in individuals with head injury who experience dysphagia and dysarthria. This patient serves as a reminder that cranial nerve assessments are required for even mild head injuries.

Keywords: Trauma, Cranial nerve, Hypoglossal nerve

EP-0908 [Neurotraumatology and Neuro Critical Care » Others]

Risk Factors and Pattern of Motor Cycle Associated Head Injury in Sokoto: An Analysis of 184 Cases Managed Over One Year

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Background: Motor cycle road traffic accident has become a global health problem¹ with mortalities between 5 and 90% in different countries (Eid et al., 2009; World Health Organization, 2009). Motorcyclists are more than 30 times likely to die in a crash than vehicle occupants (Lin and Kraus, 2009). This problem is hitherto stabilized in developed countries but continue growing in developing countries like Nigeria where motorcycle is a major means of transportation and source of income for many People. Our aim is to investigate the role of predictive factors on severity and mortality of head injury secondary to motor cycle associated accident.

Method: Mean age of patients is 27.6+17.2 years. Eighty seven percent were males while 13.0% were females. 15.7% of patients abused substance. 41.8% had moderate head injury while 23.9% had severe head injury. Extradural haematoma was the commonest reason for surgery.

Results: Majority (71.7%) had non operative management. Majority (79.3%) survived while 20.7% died. There was significant association between patients' GCS and their clinical outcome ($p < 0.001$). Sixteen (30.8%) of the patients with operative management died compared to 22 (16.7%) of those who had non operative management. This association was statistically significant ($p = 0.033$).

Conclusion: Significant number of cases of motorcycle associated head injuries occurred among the productive age groups in Sokoto with significant mortality. This would create a socioeconomic setback on the families and communities affected. We recommend that the government and other stakeholders should invest in and enforce safe means of transportation

Keywords: Motorcycle, Head injury, Sokoto

EP-0909 [Neurotraumatology and Neuro Critical Care » Others]

The Influence of Allogeneic Transplantation of Olfactory Bulb Tissue During Experimental Brain Injury in Rats

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Aim: To histomorphometric test the effect of olfactory bulb tissue on healing processes in the cerebral cortex in experimental contusion.

Method: The 15 rats, males with one-sided destruction motional centre by means of brain injury have been studied. I group - brain injury with implantation fragements of olfactory bulb tissue (TOB) - on the 1 day, II group - brain injury with implantation fragements of olfactory bulb tissue (TOB) - on the 7 day, III group - brain mechanical injury with any treatment. Material selected for histological examination after removal from the animal experiment 7,14,30 and 60 days. Standard histological techniques were used. Morphometric treatment of histological sections performed on a computer using image analyzer software "Karra Opto-Electronics GmbH" (Germany) with 400 x magnification. Province healing of experimental brain injury was divided into two zones: the transition and long. We evaluated the specific density of neurons and glial cells, neurons quantitative assessment was conducted based on their morphology, the core area and the nuclear-cytoplasmic index intact and hyperchromatic neurons.

Results: Morphometric studies showed unidirectional reparative changes in both glial and nerve cells, regardless of the distance from the contusion zone. The maximum density of glial cells in the transition zone was 62 ± 0.42 for group I-30 as compared to the control group by 30 days 19.7 ± 1 , $p = 0.004$. The density of ischemic neurons reached a maximum at day 30 (group II - 30) (19.3 ± 0.79) compared with the control by 30 days (13.3 ± 0.54), $p = 0.004$.

Conclusion: The selected experimental model has potential clinical significance.

Keywords: Olfactory bulb tissue, Brain injury, Hystomorphometry

EP-0910 [Neurotraumatology and Neuro Critical Care » Others]

Spinal Cord Injury: Epidemiological Profile in a Reference Hospital of São Paulo City

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Background: Head and spinal injury are the most frequent lesions among accident victims. Spinal cord injury occurs in 6% of these patients, and 50% present neurological deficit.

Method: A questionnaire was developed comprehending epidemiological data of patients examined in a public hospital in the periphery of São Paulo City. Accident etiology was recorded, as well as its classification according to the International Standards for Neurological Classification of Spinal Cord Injury (ASIA – American spine injury association) and need for surgery and image investigation.

Results: We noticed that cervical vertebrae fracture risk is higher among patients above 50 years old, high trauma kinetics and association with head trauma. There's also a direct relation between cervical fracture and spinal cord injury. On the other hand, lumbar and thoracic injury are associated with osteoporosis, and trauma kinetics is less important. Spinal cord injury is more frequent on the craniocervical junction (common in motorcycle accident) and toracolumbar junction (fall to the ground). Incidence in children corresponds 1 to 5% of spinal cord injuries.

Conclusion: Spinal cord injury has a higher incidence in young

adults leading to important socioeconomic impact. Due to the high risk of permanent neurological deficit it can't be underestimated. It is common the association between 2 or more vertebral segment injury, becoming indispensable throughout investigation.

Keywords: Spinal cord injury, Medulata trauma, Epidemiological profile

EP-0911 [Neurotraumatology and Neuro Critical Care » Others]

Case Report: Intervertebral Disc Space Located Bullet Projectile

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It is remarkable that the incidence of gunshot injuries has been increasing in recent years. We are presenting a case of a gunshot injury extending from the abdominal region to the intervertebral disc space. A thirty-seven year-old male patient was admitted to emergency service due to gunshot injury. One bullet entry hole was detected 4 cm superior of left spina iliaca anterior superior (SIAS), thus there wasn't any exit hole inspected. There wasn't any bowel injury in the patient who was operated by general surgeons. Surgeons could not find the bullet so that they consulted the case to us postoperatively. In the postoperative early neurological examination findings of the patient is the left toe thumb extensor muscle strength of 1/5. The spinal computed tomography images of the patient demonstrate that the bullet at level of L5-S1 intervertebral disc space without any damage to the spinal cord and the vertebra body. Electromyography (EMG) results was reported as left L4-5 level radiculopathy. The patient had no neurological deficit at postoperative first week neurological examination. The patient was evaluated by neurology-neurosurgery council; the medical treatment and to repeat EMG was suggested. Inspection is the keypoint of physical examination in gunshot injuries. These patients must be examined by removing the dresses and further investigations should be done by radiodiagnostic methods. We presented a rare case of an abdominal gunshot wound not only located in the L5-S1 intervertebral disc space but also did not lead to neurological deficit or infection.

Keywords: Gunshot injury, Bullet, Intervertebral disc space

EP-0912 [Neurotraumatology and Neuro Critical Care » Others]

Intracranial Subacute Subdural Haematoma After Spinal Anaesthesia: Severe Post Dural Puncture Headache as an Alarming Sign: A Case Report

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Intracranial subdural hematomas are extremely rare but well known complication of spinal anaesthesia procedures. Few cases have

been reported. Regarding this condition, authors report a case of subacute subdural hematoma in a patient who underwent elective caesarean section. Authors present a case of 33 year old housewife who presented with severe headache for 24 days followed by right sided body weakness for 1 day prior to admission to neurosurgical department. All these symptoms and signs appeared after her elective caesarean section to deliver her third child which was done under spinal anaesthesia. Patient diagnosed as having left sided subacute subdural hematoma which was treated surgically with excellent outcome. Intracranial subdural hematoma is very rare complication of spinal anaesthesia and it is a must to consider post dural puncture severe headache as an alarming sign for it. Early diagnosis is the guidance for management plan, whether conservative or surgical treatment is chosen, patient should be closely monitored to avoid undesirable sequelae.

Keywords: Headache, Intracranial subdural hematoma, Post-spinal anesthesia complications

EP-0913 [Neurotraumatology and Neuro Critical Care » Others]

Patient Specific Implants Created by Three-Dimensional Printing

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Background: Cranioplasty, the second procedure in the history of neurosurgery performed after trepanation, is still relevant despite the development of civilization and progress in medicine. Trends of personalized medicine have formed a niche in neurosurgery, which primarily included reconstructive operations to restore the lost skull structures. Each such operation is unique because no two patients exist with identical defects of the skull bones. The aim of our study was the development and introduction into clinical practice application of personalized titanium implants created by three-dimensional printing.

Method: The appearance of Direct Metal Laser Sintering (DMLS) technology opened up the possibility of direct implant printing of titanium, a biocompatible metal used in medicine. This eliminates the creation of any intermediate products to create the desired implant.

Results: Via this technology we have created 30 patient specific titanium implants, which were installed in 28 clinical cases of patients with different cranial defects. Terms of follow up ranged from 6 to 12 months. We have not identified any reactions or complications associated with implants. In all cases of reconstructive neurosurgery we have achieved good clinical and aesthetic results. The analysis of literature and our own experience in three-dimensional modeling, prototyping and printing suggested that a method of direct laser sintering of titanium is the most optimal for creating biocompatible surgical implants.

Conclusion: Phase I clinical trials have shown the safety of surgery with using of patient specific titanium implants created by Direct Metal Laser Sintering.

Keywords: Three-dimensional printing, Patient specific implants, Reconstructive neurosurgery

EP-0914 [Neurotraumatology and Neuro Critical Care » Others]

Making Titanium Composite Implants with Bioactive Materials for Skull Defect Reconstruction

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Additive technologies increase the potential for making individual implants in reconstructive neurosurgery. Despite a long history of cranioplasty, there are no ideal implants at present. Development of new osteointegrative materials is still an existing problem in reconstructive neurosurgery. A new technique for making individual porous and mesh Titanium composite implants with calcium phosphate-based bioactive ceramics has been developed. Individual implants are being formed based on CAD technology. CAM technology includes: 3D printing (Arcam Q10), E-beam processing of Pulvar Titanium (Ti6Al4Eli) with making porous and mesh implants. For improving osteointegrative qualities of implants, the Titanium implant surface was covered by studied by precursors of apatite crystallization using reaction-related, biomimetic approaches (impulse laser ablation). There was performed in vitro and in vivo biological testing of Titanium implant surface activated by octacalcium phosphate. Expressed matrix qualities of Titanium implant surface were revealed during cell proliferation, and implant surface covered by precursors of apatite crystallization have good osteoinductive properties. Individual porous and mesh Titanium implants with bioactive ceramics and expressed matrix qualities have been developed.

Keywords: Reconstructive neurosurgery, Individual implants, Additive technologies, Osteointegration

EP-0915 [Neurotraumatology and Neuro Critical Care » Others]

Case Presentation: Military Gunshot Wound to the Head

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Penetrating brain injuries (PBI) are traumatic brain injuries. They can be caused by low-velocity sharp objects or high-velocity projectiles. Related to missile velocity (above or below 300 m/sec) high velocity PBI's are divided into subsonic and supersonic mechanism groups. Difference between two groups are related on energy transfer from missile to the tissue and tissue injury patterns. Primary injury results from injury to soft tissue, bone fractures related vascular or cortical injuries, cerebral injuries from missile. Secondary injuries mostly results from cerebral edema. Aim of the surgery must be devitalized tissue debridement, hematoma evacuation, accessible bone fragment and missile removal,

hemostasis, water-tight dural closure, intracranial compartment separation from air sinuses transversed by bullets. Prognosis is related with level of consciousness, path of bullet (multiple lobe involvement, penetrations of midsagittal and midcoronal planes, etc), hematomas (especially intraventricular hematomas). 22 Years old, Syrian male presented to the emergency room with military gunshot wound to the head. In neurological examination patient was unconscious and GCS: 5E. In cranial CT; entrance hole at right parietal bone, right parietal lobe hematoma and parenchymal bone fragments observed. Bullet trace with parenchymal hemorrhage was from right parietal to the left temporoparietal by transversing midsagittal plane. Emergency surgery performed, intracerebral hematoma evacuated, bone fragments in parenchyma removed, devitalized tissue debrided, after hemostasis water-tight dural closure performed. After operation anti-edema medications, wide spectrum antibiotics applied. Follow-up control cranial CTs were taken. 61 Days later he was discharged from hospital with wheel chair.

Keywords: Military, Gunshot, Wound, Bullet, Head, Haematoma

EP-0916 [Neurotraumatology and Neuro Critical Care » Others]

Camel Bite Associated with Depressed Skull Fracture with Rapidly Spreading Subgaleal Cellulitis

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Camel bite represents a minimal proportion and most of them from the Middle East countries. Their infectious potential is poorly understood and the guidelines for antimicrobial treatment are not well developed. We describe a 40-year-old male, who works as a camel herder and was bitten by a camel while he was tying it down which led to a unilateral depressed skull fracture and multiple bilateral teeth puncture wounds in the scalp. He arrived to our emergency department 3 hours after injury. On scalp inspection, he was found to have multiple small teeth bite wounds. All the wounds were dry and the skin around them was healthy looking with no subcutaneous collections. CT scan of the head showed depressed skull fracture on the left temporal region associated with pneumocephalus. Within 12 hours, the patient developed spreading cellulitis in the scalp that spread into the cervical spaces. This necessitated an urgent surgical intervention. The added challenge is the presence of a dural breach in association with the depressed skull fracture. Our patient presented a challenge at several levels. He presented early with clean puncture wounds that were treated according to the most agreed upon guidelines. But our novel finding of rapidly spreading cellulitis requires alteration of recommendation towards more aggressive therapeutic attitude including early surgical intervention, especially for those patient suspected of a dural tear with the depressed skull fracture, even if treated with appropriate antibiotics.

Keywords: Camel bite, Depressed skull fracture, Subgaleal cellulitis

EP-0917 [Neurotraumatology and Neuro Critical Care » Others]

Late Onset Hemiparesis due to Pneumocephalus

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A transorbital intracranial orbital injury is rare. Penetrating orbital injuries result due to accidents, terror attacks and war. Foreign body/bodies due to such injuries may be lodged in the eye, orbit or brain. We present a case admitted for right-sided hemiparesis with the history of traffic accident a year ago. 23 year old man presented with right hemiparesis admitted to our department. Before the admission, the patient had seizure 1 week ago. He had a history of traffic accident and had a operation from left orbital fracture 1 year ago. Left eye vision has been lost postoperatively. Radiological studies showed pneumocephalus on the left frontal lobe and a foreign body amongs left orbital apex to the left frontal lobe. There was no rhinorrhea. The patient underwent a craniotomy and the foreign body was pulled out. Sinus was repaired and closed with galeal graft. The patient made a good recovery. Foreign bodies should be kept in mind in patients with pneumocephalus and a history of trauma. Sinus should be repaired and closed to prevent pneumocephalus during the surgery.

Keywords: Transorbital, Hemiparesis, Foreign bodies, Pneumocephalus

EP-0918 [Neurotraumatology and Neuro Critical Care » Others]

Sinking Skin Flap Syndrome After Decompressive Craniectomy: Case Report

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Sinking skin flap syndrome (SSFS) is a rare entity characterized by subfalcine and/or transtentorial herniation because of lower intracranial pressure for atmospheric pressure in patients undergoing decompressive craniectomy. The clinical condition of the patient may be further exacerbated by procedures such as lumbar puncture or ventricular drainage. We present a case of SSFS following decompressive craniectomy. A twenty eight-year-old male patient who was admitted to emergency service after traffic accident, had been operated for subdural hematoma and decompressive craniectomy was performed. Also another surgery was done for low pressure ventriculoperitoneal shunt insertion due to hydrocephalus developed postoperatively to the patient who was followed for a long time by external ventricular drainage. The cranial computed tomography suggested for the worsening of general condition in the postoperative follow-up. There was 19 mm midline shift, and the patient underwent cranioplasty with SSFS diagnosis. After the cranioplasty, his general condition improved, and the patient was discharged on foot. SSFS, also known as paradoxical brain herniation, may be a complication after decompressive craniectomy and could cause uncommon and fatal outcomes. Cranioplasty must

be performed for these patients as soon as possible. SSFS should be kept in mind after decompressive craniectomy.

Keywords: Sinking skin flap syndrome, Paradoxical brain herniation, Decompressive craniectomy, Cranioplasty

EP-0919 [Neurotraumatology and Neuro Critical Care » Others]

Spontaneous Rhinorrhea; Diagnosis and Follow-up After MR Cisternography

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Rhinorrhea is a clinical condition involving the direct contact of mucosal cavities of the paranasal sinuses with the CSF-containing subarachnoid space. Through this defect located in the base of the skull, it can cause significant morbidities such as meningitis, intracranial infections, pneumocephaly and cerebral compression due to them. Rhinorrhea has been determined that a large proportion of rhinorrhea depend on traumatic causes. The β -2 transferrin is detected in the rhinorrhea material and supported by radiological examinations such as cisternogram, radionuclide cisternography, CT or MR cisternography. A 42-year-old female patient applied to the hospital for complaints of a transparent nasal discharge that lasted for about two months. B2 transferrin test was performed as an example from the nasal discharge of the patient. Patient did not have a history of trauma, upper respiratory tract infection, and chronic constipation. Neurological examination of the patient has no additional complications other than rhinorrhea. The patient's infection markers were followed. No fever was detected in the patient's follow up.. BT cisternography was performed by interventional radiology, pathology was not detected. This time, MR cisternography was performed to the patient complaining of rhinorrhea. MR cisternography, contrast material leakage detection on the anterior wall of left middle ethmoid cells. The patient did not have MR after cisternography. Neurotoxic effect of Gadolinium radiopaque material, which is considered to be one of the advantages of high soft tissue resolution, is the disadvantage of not being able to evaluate the location of the CSF fistula clearly in the bone tissue.

Keywords: Spontaneous rhinorrhea, MR cisternography, Diagnosis rhinorrhea

EP-0920 [Neurotraumatology and Neuro Critical Care » Others]

Posterior Penetrating Neck Wound with the Right-Sided Brachial Plexus Disorder: A Case Report

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A 45 years old male patient was admitted to the emergency unit

due to the posterior stab wound of the neck. The knife was directed diagonally from the left to the right side of the neck. Patient was fully conscious upon admission with pain and paresthesias along the upper right extremity. Patient underwent a CT and CT angiography scan of the neck which revealed the knife blade piercing the left sided neck muscles and piercing through the intervertebral ligaments of the C IV / C V in direction to the contralateral internal jugular vein, the internal carotid artery, the vertebral artery and the brachial plexus. Patient underwent an urgent surgery according to the radiographs. Electromyography was done during the early postoperative care and it revealed an acute lesion of the right-sided C 5 nerve root. Follow-up MRI scan three months after injury revealed an intact brachial plexus bundles on the site of injury. Symptoms of reduced muscle strength and limited range of motion of the upper right extremity prevailed. Penetrating neck injuries represent a rare entity of all trauma injuries in our Department. Meticulous preoperative radiographs revealed a close proximity of the knife blade tip to the right-sided vertebral artery and the internal jugular vein. Limited postoperative abduction at the right shoulder correlated to injury of the C 5 nerve root.

Keywords: Penetrating neck wound, Brachial plexus disorder, Injury of the nerve root

EP-0921 [Neurotraumatology and Neuro Critical Care » Others]

Computer Tomography in the Diagnosis of Acute Traumatic Brain Injury

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Fergana branch of RSCEMA for the period 2015-2016, 200 patients with traumatic brain injury conducted brain MSCT. Of these, 110 were men and 31 women, children accounted for 59 patients. Computed tomography of the brain was performed at the SIEMENS Somatom Emotion 6. firmmultispiraltomograph according to standard procedure. Brain contusion was diagnosed in 56 patients. Injuries are mainly localized in the basal pole and pole-konvektstisial-basal frontal and temporal lobes of the brain. When clinical manifestations of severe injuries were determined extensive pathological lesions as in the strike zone, and the zone shok-proof (poles-basal or konvektstisial-line-basal sections of the frontal and temporal lobes of the brain with the depth of distribution). Injuries of brain matter in conjunction with fractures were found in 13 patients, hemorrhagic injuries (diapedetic bleeding in the brain substance) - at 17, contusions with subarachnoid hemorrhage- at 16, epidural hematoma with fractures were found in 33 patients and were visualized on CT a biconvex or plano-zone high density under the vault of the skull, subdural hematoma with a fracture of the skull bones were found in 13 patients and CT had a kind of crescent high density zones, embracing widely hemisphere of the brain, intracerebral hematomas were detected in 3 patients. In this way, computer tomography of the brain is a modern and informative method of research in urgent neurosurgery and is of paramount importance in the diagnosis of intracranial hematomas.

Keywords: Brain injury, Computer tomography, Hematoma

EP-0922 [Neurotraumatology and Neuro Critical Care » Others]**Occipital Calcified Chronic Epidural Hematoma**

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Chronic calcified/ossified epidural hematomas (EDH) are rare complications of head trauma or cranial procedures. The more underwent head computed tomography after minor injuries, the identification of epidural hematomas has been risen. The exact incidence of epidural hematoma ossification is unknown. It has been hypothesized that damage to vascularized tissues such as bone and dura provokes inflammation, repair and remodelling in tissues. Careful follow-up seems to be mandatory when EDHs are treated conservatively. A 32 year-old woman was admitted to our outpatient department with the complaints of severe headache. She had a head trauma 1 year ago. She had no neurological deficit. She had no metabolic, endocrinological, or systemic disease. All routine hematological investigations and coagulation profile were normal. Calvarial X-ray showed no fracture line but inner table calcified line. CT scan of brain revealed left side suboccipital hypodense area with calcified inner layer of 4-5 mm thickness. MRI scans showed suboccipital hypodense and non-contrast enhancement area. After the diagnosis, both advantages and disadvantages of surgical and non-surgical treatment options were told to the patient. Regarding the patient's informed consent on conservative treatment and the patient's good clinical condition, the patient was decided to be followed-up clinically, radiologically with successive CT scans and MRI. Head injuries are major public health problem worldwide. Since the introduction of CT scan, incidence of surgical and non-surgical EDH among patients reported to be in range of 2.7-4% with mortality around 5% in children and 7-12.5% in comparable adults. Osseous transformation is still not well understood.

Keywords: Calcification, Epidural hematoma, Ossification

EP-0923 [Neurotraumatology and Neuro Critical Care » Others]**Assessing Efficacy of NeuroAiD in Improving Functional Outcome in Intracranial Hemorrhage and Traumatic Brain Injury**

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Background: NeuroAiD, a combination of natural products, is used to improve recovery after ischemic stroke. Its neurorestorative properties in preclinical model of traumatic brain injury (TBI) makes it attractive for treatment of brain injuries. We aimed to evaluate the safety and potential efficacy of NeuroAiD in brain injuries.

Method: The NeuroAiD Safe Treatment (NeST) Registry (clinicaltrials.gov NCT02536079) is a registry that provides

information on use and safety of NeuroAiD in clinical practice. We analyzed anonymized information of TBI and intracerebral hemorrhage (ICH) patients in the NeST Registry (www.neuroaid.com/en/nest/main/index). Patients consented are prospectively entered using online forms for baseline and follow-ups. Data collected include demographics, diagnosis, medical history, modified Rankin Score (mRS), Glasgow Coma Scale (GCS), National Institute of Health Stroke Scale (NIHSS), compliance and side effects.

Results: Sixty-one patients from Malaysia were included in the NeST registry, 43 with ICH (mean age 57.53 ± 13.36 years; female 16) and 18 with TBI (mean age 44.2 ± 17.1 years, female 5). Median GCS for TBI patients was 11 (range 3-15) at baseline, 13 (6-15) at visit-2 (V2), 15 (10-15) at V3 and 15 (6-15) at V4. Median NIHSS for ICH patients was 10 (0-33) at baseline, 8 (0-26) at V2, 11 (0-41) at V3 and 8.5 (0-31) at V4. mRS improved over time for both TBI and ICH patients. One patient with Sjogren's reported side effect (skin rash/lip ulcer) at day 35 of NeuroAiD intake.

Conclusion: NeuroAiD was safe in TBI and ICH patients with improved overall functional, neurological and cognitive measures.

Keywords: Brain injuries, Safety, Efficacy, NeuroAiD

EP-0924 [Neurotraumatology and Neuro Critical Care » Others]**Difficult Cases in Surgery of Gunshot Wounds to the Skull and Brain - A Single Center Experience**

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Aim: To analyze the results of treatment of patients with difficult combat traumatic brain injuries caused by a gunshot (gTBI), to develop practical recommendations for their treatment on the basis of personal experience and analysis of literature sources.

Method: The results of treatment of 2,120 wounded May 2014 to January 2017 have been analyzed. Combat gTBIs were diagnosed in 160 patients. The following groups have been referred to severe gTBIs: A. By the kind of the wounding shell: bullet, multiple fragmentation mine and explosive brain injuries, B. By the nature of the wound canal: diametrical, diagonal. C. By the location of the wound canal: bilateral, transventricular, transbasal, penetrating wounds with the injury of paranasal sinuses. D. By the presence of severe structural injuries of the brain substance: injuries of subcortical ganglia, brain stem, and cerebellum, extended loci of brain contusion and crushing, multiple loci of brain contusion and crushing. E. By the presence of injuries of functionally important brain vessels: main arteries (trunks and their major branches), venous sinuses.

Results: Difficult severe injuries were diagnosed in 74 (46.25%) patients out of 160 cases of combat gTBIs. 18 patients out of 160 patients with gTBIs died. Mortality comprised 11.25%. The mortality rate for severe combat gTBIs is 24.3%.

Conclusion: Detection at the stage of diagnosing of severe combat gTBIs takes surgical tactics and intensive therapy into the right direction in accordance with developed practical recommendations.

Keywords: Combat traumatic brain injuries, Gunshot wounds, Difficult cases, Surgery, Single center experience, Practical recommendations

EP-0925 [Neurotraumatology and Neuro Critical Care » Others]

A Rare Complication of Arachnoid Cyst

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Arachnoid cysts are congenital lesions and they are benign and non-neoplastic. The symptoms associated of arachnoid cysts of the central nervous system depend cyst size and growth rate, location. In literature, some cases associated with cerebrospinal fluid dynamic disorders are reported. Generally, arachnoid cysts are asymptomatic and they are not be presented with intracranial haemorrhage or hygroma. Intracranial haemorrhage/hygroma are rarely seen, but after various head traumas may cause to these conditions. We present two cases with subdural hygroma which observed after arachnoid cyst rupture. The first case is 31 year-old male. In anamnesis, he had a head trauma 5 months ago and has persistent headache and dizziness. The second case is 49 year-old male and he has similar symptoms and also had headache. They are fully conscious oriented. Physical examination and the lab results were normal. Computerized tomography showed the intracranial temporal arachnoid cyst and the subdural hygroma. The follow up time of the first patient is 3 years and 1 months for second. The first patient was operated for draining the subdural hygroma with a burr-hole, but after 9 months the patient admitted and enlarged cyst and relapsed hygroma are detected. After these findings subdural-peritoneal shunt was placed. The second was operated only with subdural-peritoneal shunt with no hygroma drainage. They are in a good condition. We present this cases for explain a reason: a benign formation of arachnoid layer can be transform to a life-threatening condition. We have to be careful about head trauma in this cases.

Keywords: Rupture cyst, Hygroma, Headache, Post-trauma

EP-0926 [Neurotraumatology and Neuro Critical Care » Others]

Neurological Surgery Admissions to the Intensive Care Unit of a Tertiary Health Institution in South-East Nigeria: An 8-Year Review of Patterns and Outcome

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Aim: To evaluate the clinico-demographic patterns, and assess the factors determining outcome of neurological surgery admissions to the intensive care unit (ICU) of a tertiary health institution in South-East, Nigeria.

Method: A retrospective study of all neurological surgery patients admitted into the general ICU of a tertiary health institution over 8 years that ended, March 2016. Relevant data from ICU admission-discharge registers and patients' case notes were collected on

proformas. Analysis was done using the Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 20.0.

Results: Neurosurgery ICU admissions were 539, males 405(75.1%), and 134 (24.9%) females. Aged ranged from 2 months to 80 years (mean 36.65 ± 19.41 years). 26.6% of the admissions in their first 3-decade of life. 75.7% were admitted for traumatic brain injury (TBI), mostly resulting from motorcycle and motor vehicular accidents. Other indications were post-operative patient monitoring (10.52%) and high cervical spinal cord injury (4.78%) and others. 141 patients (26.1%) had a neurosurgical intervention either prior to or during the ICU admission. Admission into the ICU was delayed in about 20%. The lengths of admissions ranged from ≤ 24 hours to 151 days (median 4 days, mode: ≤ 24 hours). 56.2% of admitted patients achieved significant recovery and were discharged. Less than 7 days admission had higher mortality and this was statistically significant.

Conclusion: Severe TBI was the most common indication for ICU admission. Length of ICU stay influences outcome. More ICU facilities and personnel are needed to further improve outcomes.

Keywords: Severe TBI, Neuro-critical care, Trauma, Monitoring

EP-0927 [Neurotraumatology and Neuro Critical Care » Others]

Differential Diagnosis of Severe Alcohol Intoxication, Traumatic Brain Enabling Damage

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Alcohol affecting the nervous system, can cause significant changes in cerebral and focal neurological picture, and therefore have difficulty differentiating signs of intoxication and traumatic brain injury. Studying the dynamics of neurological symptoms, depending on the blood alcohol concentration shows that even with a mild degree of intoxication (blood alcohol concentration of about 0.5-1.5% arises emotional liability, impaired coordination of movements of criticism and orientation. With moderate intoxication (blood alcohol concentration of 1.5 to 2.5% of the 32.6-54.3 mmol/l) occur more profound changes in the mental state of the patient: drunk very lively decouples or conversely sleepy completely indifferent to the state of euphoria reaches its highest expression: a person becomes complacent, cheeky, cheerful often there are changes in the nature of the criticism of his behavior drastically reduced, exposed instincts, reactions to external stimuli often acquire affective form, in an insignificant occasion may be the rage, joy and others. Here ataxic disorders defined as a change in handwriting, incoherent, poorly articulated speech, etc. Pain and tendon reflexes weakened abdominal reflexes, as a rule, are not called.

In this way, in patients with alcohol intoxication, even small closed craniocerebral trauma can lead to extensive destructive changes in the brain, its blood vessels and membranes that is caused by changes in the vessel walls, and increased tendency to edema-swelling of the brain. The postoperative period in these patients is much harder for. Such patients require intensive treatment aimed primarily at improving brain blood circulation and reduce edema, swelling of the brain.

Keywords: Alcohol, Brain injury, Brain swelling

EP-0928 [Neurotraumatology and Neuro Critical Care » Others]**Management of Depressed Fractures Overlying Cranial Dural Venous Sinuses**

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Background: Managing depressed fractures overlying dural sinuses remains challenging because of the purported potential morbidity associated to conservative treatment and risks of surgery. Faced with this therapeutic dilemma, we herein present the sociodemographic, clinical and radiological features of a meticulously followed up cohort, their therapeutic indications and outcomes in the hope to draw some conclusions.

Method: We followed up a cohort of 17 patients with fractures over different calvarial dural venous sinuses from January 2014 to December 2016. Six (35.1%) were simple depressed (SDFs) and 11(64.7 %) compound depressed fractures (CDFs). Nine patients (52.9%) were treated surgically while 8 (47.1%) were treated conservatively.

Results: The mean age was 20.8 years. Sixteen were males (97.12%). The mean time from trauma till hospital arrival was 3.8 hours and the mean admission GCS was 13.7. Twelve patients (70.59%) had the fracture overlying the superior sagittal sinus (SSS) of which 6 (35.29%) were anterior. The mean length of hospital stay was 5 days and mean follow-up duration was 6.8 ±2.7 months. Fourteen patients (82.35%) had good recovery. No mortality was registered.

Conclusion: The majority of SDFs and some CDFs can be managed safely without major surgical intervention. Conservation should be favored when the sinus is patent, dura intact, bone displacement is insignificant in neurologically intact patients with apparently clean wound.

Keywords: Compound depressed fracture, Dural sinuses injury, Simple depressed fracture

EP-0929 [Neurotraumatology and Neuro Critical Care » Others]**Mortality in Patients with Traumatic Cervical Spinal Cord Injury: A Systematic Review**

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Background: Assessment of disease mortality has important effects on health decision-makings. Spinal cord injuries have important financial, psychological and social effects.

Method: We performed searches in the MEDLINE and EMBASE for observational studies that evaluated mortality of TCSCI. Only those observational studies with eligible data were included. Study quality was assessed using a modified quality assessment tool that was designed previously for an observational study. The studies that evaluated the risk factors by statistical analysis were determined.

Results: Forty observational studies involving 18,747 patients were included. These studies were published between 1997 and

April 2016. The mortality rate was between 2.2% and 65.8%. 2.2% was mortality in incomplete TCSCI and 65.8% was mortality in individuals with ages older than 50. Prehospital mortality was not reported. The mean In-hospital mortality was 16.7%. Mean Percentage of Mortality of TCSCI 6, 12, 18 months, 5.3 years and 20 years after injury was 31.8, 10.4, 12, 25.3 and 49.4 respectively. According to the quality assessment criteria, 18 studies were of high quality, 21 studies were of moderate quality, and 1 study was of low quality. In the pooled subjects, the cause of death was unclear in 3538 of 3786 deceased patients (90%). Eighteen (45%) studies reported risk factors for mortality and generally the most significant factors were age, ASIA score

Conclusion: Unfortunately despite widespread and importance of the issue a few prospective studies conducted. It needs long-term follow-up prospective clinical studies with determination of cause of death to assess treatments' overall impact on mortality.

Keywords: Traumatic spinal cord injury, Systematic review, Mortality

EP-0930 [Neurotraumatology and Neuro Critical Care » Others]**Retroclival Epidural Hematoma Secondary to an Oblique Clivus Fracture**

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Retroclival epidural hematoma (RCEH) due to a clivus fracture is a rare entity. It may be hard to recognize due to inexperience or artifacts caused by dense surrounding bone structures. Herein is presented a case of RCEH caused by an oblique displaced fracture of clivus treated conservatively and resulted in a relatively favorable outcome. A 36 year old male patient was brought to the ER after being hit by a truck on the side of the road. The patient was awake but had dysarthria. His GAG reflex was negative and had monoplegia in his left arm. Cranial CT revealed signs of traumatic SAH along with fractures at the C1 transverse process and posterior arch, occipital condyles and clivus. A RCEH measuring 7.1 mm compressed the brainstem from the anterior. Due to a suspicion of vertebrobasillary artery complex injury CT angiography was ordered but did not yield any pathology. He was endotracheally intubated, received sedation for 5 days along with 16mg/day Dexamethasone IV therapy. After weaning, he regained consciousness, had 3/5 motor strength in his left arm. His GAG reflex improved minimally. Upon 15 days of rehabilitation, he was discharged with the advice of extensive physical therapy and rehabilitation. RCEH due to a clivus fracture is not a common entity thus most physicians may lack experience in diagnosing, managing and treating this pathology. Although surgical intervention may be employed, due to its eloquent area and the results of conservative treatment, a follow up period along with steroid therapy may be employed.

Keywords: Retroclival epidural hematoma, Clivus, Fracture

EP-0931 [Neurotraumatology and Neuro Critical Care » Others]**A Case of Orbitocranial Foreign Body**

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Penetrating injuries of eye and orbit are usual situations. Foreign bodies (FB) on eye, orbit or brain are generally due to accidents or assaults. However FB that penetrating both orbit and brain is rare. We report a rare case of orbitocranial FB due to a traffic accident which treated by us. A 28 year old female referred to emergency after a traffic accident. She was only complaining about headache. No visual loss was complained from her. She was well cooperated and orientated. On physical examination her GCS was 15/15, visual activity was 10/10, eye movements were normal and a nearly 1 cm laceration was detected on her left palpebrae. No rhinorrhea was detected. There was no signs of meningitis. On X-RAY images there was a hyperintensity on superiomedial wall of left orbit. On computed tomography fracture of orbital roof, superiomedial wall of orbit, an irregular view of a FB and pneumocephaly were revealed. Empirical broad spectrum antibiotherapy was organised, an urgent operation was planned, a frontal craniotomy was done under general anesthesia. A piece of glass and dural tear was seen. Glass was excised, dura mater was repaired, left palpebrae was primary sutured. Postoperative neurological examination was normal. FB treatment which are lying both orbit and brain must be based on excision of it. If a FB affects intracranial structures or dural entirety, its repair must be performed after excision. Also broad spectrum empirical antibiotherapy must be planned for decreasing risk of infection. If injury causes an ophthalmologic complication an ophthalmologist must be included to treatment equip to interfere in orbital complications. Organising multidisciplinary approach by ophthalmologists, anesthesiologists and neurosurgery provides best clinical outcomes on treating the patients like these.

Keywords: Orbitocranial, Injury, Foreign body

EP-0932 [Neurotraumatology and Neuro Critical Care » Others]**A Rare Case of Craniofacial Injury with a Combat Knife**

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This report aims to present a rare case of penetrating craniofacial injury caused by a combat knife. A 20 year old male who presented with penetrating injury to the face. Initial examination showed the knife as entering through the right nasolabial fold. Patient had a Glasgow Coma Score of 14 with no focal neurological deficit including vision and ocular motility. Computed tomography (CT) revealed the knife to be passing through the right maxillary sinus, nasal cavity, then through the cribriform plate into first the right and then left frontal lobes. This had resulted in bifrontal parenchymal as well as right frontotemporal subdural hemorrhage and edema of the right frontal lobe causing a midline shift. CT angiography did not show any vascular injury. The patient underwent emergency

decompressive surgery and evacuation of the subdural hemorrhage. The knife was then pulled out under direct visualization of the anterior fossa, which was also repaired subsequently. Patient had an uneventful postoperative course and was discharged with a Glasgow outcome score of 5. Penetrating facial injury may result in serious intracranial injury even in the civilian population and should be managed expeditiously

Keywords: Combat knife, Cranium, Cribriform plate, Penetrating

EP-0933 [Neurotraumatology and Neuro Critical Care » Others]**The Use of Individualised Titanium Cranial Implants in the Reconstructive Neurosurgery in Patients After Head Injury - Personalised Reconstructive Neurosurgery**

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Reconstructive neurosurgery plays an important role in the management of patients after head injury. The material of choice used in the reconstruction of bony structures of the head is the autologous bone. But in some situations there is a necessity to use an artificial material (PMMA, PEEK, hydroxyapatite, titanium, osteoconductive granules or strips). The presented individualised cranial titanium implants made by modern 3-dimensional print technology have the following characteristics: high mechanical resistance and stability, small thickness and low weight, biocompatibility, low tendency to form biofilms (anti-infective effect), persistence material – lifetime, reusability possibly after infection, the option of porous structure. In our clinic we prefer a close cooperation between the neurosurgeon and biomedical engineers. This process consists of several steps: indication of the reconstructive surgery, initial morphological data for the implant planning (CT of the head), plastic 3D CAD model of the head with plastic cranial implant (consultation neurosurgeon-biomedical engineer), manufacture of the final titanium implant, consultation before the operation, the presence of biomedical engineer in the operating room during reconstructive surgery, post-operative X-ray scan and follow-up, interdisciplinary backward analysis of the case. Our first experiences with the use of titanium cranial implants confirm that the individualised titanium cranial implants are a good choice for the patients with the need of reconstructive cranial surgery in these situations: large and irregular bone defect, defect of orbito-maxillo-facial complex, increased risk of infection, increased risk of fall (epilepsy, repeated falls) and intolerance of another materials.

Keywords: Reconstructive neurosurgery, Individualised titanium cranial implants, Cranioplasty

EP-0934 [Neurotraumatology and Neuro Critical Care » Others]**Major Improvement in Glasgow Outcome Score Related to Timely Surgical Decompression of Acute Subdural Hematoma**

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Background: Acute subdural hematomas (ASDH) can be fatal sequela to traumatic brain injury (TBI). Timely surgical decompression is the goal of therapy. Time to surgery has never been compared to the Glasgow Outcome Score (GOS). The aim of this multicenter study was to establish whether reduction in the time interval between injury and surgical decompression could improve the GOS in patients at 3 months.

Method: Consecutive patients with TBI admitted to the neurosurgical departments of three tertiary level hospitals. Only adult patients with supratentorial ASDH measuring at least 10 mm clot thickness and 5 mm midline shift, thus requiring surgery, were included in the study. Exclusion criteria included children, those not salvageable and those that did not meet the criteria for surgical decompression.

Results: 4255 patients with TBI were admitted to the three hospitals over a ten years. 855 comatose patients with ASDH with or without intracerebral hemorrhage were enrolled. Mean time to surgery was 5 hours and 25 minutes. There was no statistically significant difference between GOS and gender or demographics. There was a statistically significant correlation of GOS with motor score ($P < 0.001$), intracranial pressure ($P < 0.001$) and time to surgical decompression ($P < 0.0001$). Using multivariate analysis, the data suggests that surgery under 3.25 hours is associated with the best 3 month outcome ($P < 0.001$).

Conclusion: Results suggest that lower ICP and higher motor scores are associated with improved outcome after ASDH. Shortened time to surgical decompression is also associated with improved GOS at 3 months despite motor scores.

Keywords: Subdural hematoma, GOS, Time to surgery

EP-0935 [Neurotraumatology and Neuro Critical Care » Others]**A Rare Incidence of Transorbital Intracranial Injury**

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Transorbital intracranial injury is an unusual case, representing 0.04% of penetrating head trauma with a high mortality rate. Orbital penetrating injuries may cause severe brain injury if intracranial is involved as the orbit forms an easy path for low-velocity foreign bodies into the intracranial space. Critical neurovascular structures are often damaged or at risk of additional injury resulting in further neurological deterioration, life-threatening hemorrhage, or death. Delayed complications can also be significant and include traumatic pseudoaneurysms, arteriovenous fistulas, vasospasm, cerebrospinal fluid leak, and infection. We present 2 cases of penetrating brain

injury, one of it transversing the orbit, maxillary sinus and cranial fossa and another case of penetrating traumatic injury which compromised the cerebral vasculature causing pseudoaneurysm. We discuss the incidence, pathology, and a brief literature review of transorbital cranial injuries to highlight the principles of management pertaining to it and involvement of cerebrovascular structures.

Keywords: Craniocerebral trauma, Penetrating head injuries, Eye foreign bodies, Traumatic pseudoaneurysm

EP-0936 [Neurotraumatology and Neuro Critical Care » Others]**Impact of Thoracic Injury on Traumatic Brain Injury Outcome**

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Background: TBI patients admitted to our department were retrospectively evaluated.

Method: We developed two prognostic models based on admission predictors with logistic regression analysis to assess the significance of thoracic injuries in determining the 30-day mortality and outcome.

Results: Patients with a PCS ≥ 6 had a 3.142 and 8.065 times higher odds of mortality and poor outcome compared with patients with a PCS < 6 , respectively. Any one-score increase of the TTS had a 1.193 times higher odds of a poor outcome ($p = 0.017$). The predictive model for mortality and 30-day functional outcome both had good accuracy (AUC: 0.875; 95% confidence interval [CI], 0.841-0.910 and AUC: 0.888; 95%CI, 0.860-0.916, respectively). Internal validation showed no over optimism in any of the two models' predictive C statistics (C statistic 0.872 for 30-day mortality and C statistic 0.884 for the 30-day neurological outcome). The external validation confirmed the discriminatory ability of these models (C statistic 0.949 (95%CI: 0.919-0.980) for 30-day mortality and C statistic 0.915 (95%CI: 0.868-0.963) for the 30-day neurological outcome). The calibration was also good for patients from the validation population (H-L test $p > 0.05$).

Conclusion: Thoracic injury diagnosed by CT has a negative impact on the 30-day mortality and functional outcome of TBI patients. The extent of PC and the TTS are the predictors for TBI outcome.

Keywords: Traumatic brain injury, Thoracic injury, Outcome

EP-0937 [Neurotraumatology and Neuro Critical Care » Others]**Resolution of Tension Pneumocephalus by Burr Hole Trephination and Saline Infusion**

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Korea

Tension pneumocephalus is a rare condition but in case with a neurologic deficit, a neurosurgical emergency operation is needed. Some authors have reported a few surgical techniques -burr hole drilling and air aspiration, insertion of an external drainage catheter- for tension pneumocephalus. In this study, we describe a

case which is treated by burr hole trephination, saline infusion and dural defect repair. A 66-yr-old male patient with a traumatic open fracture of frontal bone was admitted and underwent immediate neurosurgery including bone fragments removal. Next day, his conscious level deteriorated and he became unresponsive. A CT scan revealed a large fronto-parietal pneumocephalus compressing both frontal lobes. Bilateral burr hole with normal saline irrigation in subdural space was performed. Dural defect on fracture site was repaired with autologous galea aponeurosis. Finally, his mentation showed marked improvement after surgery. resolution of tension pneumocephalus by burr hole trephination, saline infusion and dural defect repair can be achieved

Keywords: Tension pneumocephalus, Burr hole, Saline irrigation

EP-0938 [Neurotraumatology and Neuro Critical Care » Others]

Results of Delayed Cranioplasty of Skull Defects Using Nanocomposite Metallo-ceramic in the Experiment in Rats

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Background: The defects of the skull bones is an urgent problem in connection with the increase in injuries, in particular, during the fighting, in the structure where a significant place is occupied by traumatic brain injury. Actual need for the development of improved materials for the substitution of bone defects of the cranial vault. Our aim is to substantiate the use of the nanocomposite metal ceramics for the delayed cranioplasty in rats in the experiment based on the analysis of the results of spiral computed tomography and histological investigations.

Method: In the experiment, a delayed cranioplasty with the use of nanocomposite metal ceramics was performed in 10 white rats (body weight 300–450 g, average age 6–8 months old). After 3 months after craniectomy performed SCT with 3D-reconstruction. The density of the bones of the cranial vault and implants expressed in conventional units of density by Haunsfeld. Standard histological techniques were used.

Results: SCT data showed an absolute consolidation of used grafts with bone defect. The nanocomposite metal ceramic implant showed a high effectiveness for replacement of the bone defects and for the forming of the regenerate with the active participation of the surrounding tissues, especially blood vessels invasion into the implant.

Conclusion: The experiments results confirmed the possibility of large flap craniotomy with the following delayed cranioplasty in rat bucks using nanocomposite metal ceramic. The use of the nanocomposite metal ceramic promotes to formation of newly formed bone tissue either dense or spongy one. The use of nanocomposite metal ceramic may be recommended for clinical trials.

Keywords: Delayed cranioplastic, Large flap craniotomy, Nanocomposite metal ceramic

EP-0939 [Neurotraumatology and Neuro Critical Care » Others]

Postoperative Results of Acute Subdural Hematoma Cases, Age Above 60 Years

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Aim: To analyze the clinical results of traumatic acute subdural hematoma with decompressive craniectomy, age above 60, in our clinic.

Method: Thirty cases, older than 60 years, with traumatic subdural hematoma that operated in our clinic between 2013-2016 years, retrospectively analysed. Patients have followed for 23 months in average.

Results: Nineteen men, 11 women. 19 patients between age 60-80; 11 of them are above age 80. Patient number that become excitus is 12: 8 men, 4 women; 4 of them above age 80 (2 men 2 women). Mortality rates are 42,1% between age 60-80 and 36,36 above age 80: in total 40%.

Conclusion: In our study, interestingly, mortality rate was found to be lower in patient group above age 80 comparing to patients age between 60-80.

Keywords: Acute, Subdural, Patient, Mortality

EP-0940 [Neurotraumatology and Neuro Critical Care » Others]

Experience on Efficacy in the Use of Enteral and Parental Nutrition Simultaneously

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Background: It is important to avoid malnourished in the patient with cranioccephalic trauma admitted to the ICU after surgery, as they present up to 20 times more complications, this can be achieved through the adequate intake of nutrients enterally, parenterally or mixed. The aim of this study is to determine the nutritional efficacy of the patient with cranioccephalic trauma admitted to the ICU; epidemiological characterization by age, sex, pathology, nutritional status, associated disease, aggregated infectious processes and complications of parenteral feeding.

Method: A controlled clinical trial of 51 patients with cranioccephalic trauma admitted to the ICU of Roosevelt Hospital from January to October 2014.

Results: 82.4% of the patients were male and 37.3% were over 40 years old; Of the associated diseases 5.9% had arterial hypertension, 19.6% presented sepsis and 9.8% of the patients developed dehydration with acute renal failure during their stay in the ICU; According to nutritional status only 2% were moderately malnourished, 70.5% received enteral nutrition and only 9.8% received mixed nutrition; Regarding efficacy, in general, 60.8% gained weight and 2% lost weight; Patients with enteral nutrition were those who gained weight in greater proportion, followed by parenteral and mixed nutrition.

Conclusion: Mixed nutrition was less effective regarding to weight gain, in relation to enteral and parenteral nutrition in the patient with cranioccephalic trauma admitted to the ICU. However, this difference was not statistically significant ($p=0.289$).

Keywords: Efficacy, Cranioccephalic trauma, Mixed nutrition, Parenteral nutrition, Enteral nutrition

EP-0941 [Neurotraumatology and Neuro Critical Care » Others]

Pneumocephalus Resulting from Compressed Air Injury to the Orbit

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Pneumocephalus is mostly caused by fracture of the base of the cranium following head trauma. Pneumocephalus without any bone fracture is very rare. An adolescent boy who was wounded in his right eye with a compressed air gun admitted to our institute. He had orbital emphysema but no visual loss. Though he had no bone fractures, there was excessive amount of air in his right orbit which extended into cranial cavity in orbital and cranial computerized tomography scans. He was followed-up for 3 days and discharged without any sequela. Control CT scan that was performed on 2nd week following injury demonstrated complete resorption of intracranial air. Several cases of pneumocephalus resulting from compressed air injury to the orbita without any fracture have been reported in the literature. The passage of air from orbit to intracranial space was suggested to be via dissection beneath Tenon fascia, around the optic nerve and through the optic canal into the subarachnoid space and ventricles since cerebrospinal fluid around the optic nerve have connection to intracranial subarachnoid space. High pressure air injury to the orbit and pneumoorbitus may result in severe injuries such as optic atrophy or optic nerve transection. But pneumocephalus resulting from high pressure air injury to the orbit is a benign entity since there is neither inverted soda bottle nor ball valve mechanism involved which may cause tension pneumocephalus.

Keywords: Pneumocephalus, Compressed air injury, Orbital emphysema, Intracranial air, Pneumoorbitus

EP-0942 [Neurotraumatology and Neuro Critical Care » Others]

Complications of Decompressive Craniectomy in Patients with Traumatic Brain Injury

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Background: Management of intracranial Pressure (ICP) secondary to traumatic brain injury is a challenge for neurosurgeons. Decompressive craniectomy has been used as an end-point management option, lower ICP. Although it is a technically simple procedure the complications secondary to the surgery, can affect the patient's recovery, prolong the hospital stay and in turn increase associated morbidity and need for re-surgery. We aimed to determine the frequency and time interval of complications to

occur secondary to decompressive craniectomy in these patients.

Method: We prospectively collected data using a structured proforma of patients, operated at the Aga Khan University Hospital, Karachi. Any complication occurring in the 30 days of postoperative period was recorded. Data was analyzed using SPSS 20.

Results: A total of 99 in patients were identified. Seventy-eight were male. Mean age recorded was 37.57 ± 15.38 years; mean GCS before surgery was 8.58 ± 2.69 ; mean time from admission to surgery was 2.25 ± 0.90 ; unilateral decompression was done in 86.9% patients; mean hospital stay was 15.25 ± 8.45 days; mean Glasgow Outcome Score was 3.1 ± 1.045 at 1 month. Most common mechanism of injury was blunt trauma 48(49%). Overall complication rate was 69.7%, amongst which contusion expansion, external cerebral herniation & subdural effusion was found 19%, 29% & 39% respectively. Mean time interval for these to occur was 2.05 ± 1.129 , 2.84 ± 1.24 and 16.06 ± 3.54 respectively.

Conclusion: In our study 56(56.6%) patients had moderately severe injury based on GCS. Our overall complication rate was 69.7%. Subdural was observed as the most common complication in our study

Keywords: Decompressive craniectomy, Traumatic brain injury, Contusion expansion, Subdural effusion, External cerebral herniation

EP-0943 [Neurotraumatology and Neuro Critical Care » Others]

Epidural Hematoma: A Retrospective Analysis of Morbidity and Mortality in 86 Patients

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Background: Intracranial epidural hematoma (EH) is the surgical typical emergency. Functional prognosis of this life-threatening head trauma injury complication is closely related to fast neurosurgical management in most cases. The aim of this study was to identify prognostic factors influencing morbidity and mortality due to this traumatic injury.

Method: 86 trauma patients were diagnosed as suffering from EH. They were managed between November 2012 to July 2015 in our neurosurgical department.

Results: Average age was 32.65 years with a sex ratio of 7.6. Initial loss of consciousness was found in 84.88% of our cases. In the initial clinical examination, 74.76% of our patients had a Glasgow Coma Scale superior to 12, 4.65% were between 8 and 12, and 18.60% were comatose. 39.53% of patients were managed conservatively, while 52 cases were operated: 47 were operated immediately and 22 were operated upon as delayed subsequent to neurological deterioration and/ or increase in the volume of EH. There was 9 deaths (10.46%). Anisocoria ($p=0.0037$) and mass effect with midline shift ($p=0.011$) were strongly correlated with mortality. Other parameters were only influencing outcome: patient transfer and timing of surgery, location of EH and intracranial associated lesions. We also found a correlation with both morbidity and mortality for the following

parameters: age, initial loss of consciousness, Glasgow coma scale, and the number of EH.

Conclusion: Fast discharge of patients with head trauma to neurosurgical centers and progress of neuro-intensive care improved prognosis and reduce morbidity and mortality secondary to this traumatic injury.

Keywords: Epidural hematoma, Head trauma, CT-Scan, Glasgow coma scale, Prognosis

EP-0944 [Neurotraumatology and Neuro Critical Care » Others]

Influence of Alcohol Intoxication on Outcome After Surgery for Craniocerebral Injury

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Background: Although expected the adverse effect of alcohol intoxication at the time of injury has not been proven by the current literature data. The aim of the study is the analysis of the importance of alcohol intoxication at the moment of injury together with other factors (age, extent of brain injury) for the treatment outcome in patients operated on for craniocerebral injury.

Method: The group of studied patients included 246 head injured patients after surgery for brain injury. The effect of alcohol intoxication at the moment of injury (blood alcohol level over 0.1%) together with age and the presence of brain contusion requiring decompression on the final clinical outcome (Glasgow Outcome Scale) was studied.

Results: 54.1% of patients under 60 years of age were alcohol intoxicated at the moment of injury. The incidence of alcohol intoxication in patients older than 60 years was 35,7%. The incidence of expansive brain contusions requiring surgical decompression was higher in patients older than 60 years and alcohol intoxicated. Statistical analysis did not show worse prognosis in alcohol-intoxicated patients. The presence of significant contusions influenced the injury prognosis only in patients younger than 60 years.

Conclusion: The study did not show significant deleterious effect of alcohol intoxication at the time of injury on the final outcome.

Keywords: Craniocerebral injury, Alcohol intoxication, Brain contusion, Outcome

EP-0945 [Neurotraumatology and Neuro Critical Care » Others]

Analysis of the Effectiveness of Using Allogeneic Tissue of the Cerebral Cortex of Fetal Brain During Experimental Brain Injury in Rats

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Aim: To histomorphometric study of the effect of allogeneic fetal neural tissue healing processes in the cerebral cortex in experimental injury.

Method: The 15 rats, males with one-sided destruction motional

centre by means of brain injury have been studied.

I group - brain injury with implantation fragments of allogeneic fetal neuronal tissues (AFNT) - on the 1 day,

II group - brain injury with implantation fragments of allogeneic fetal neuronal tissues (AFNT) - on the 7 day,

III group - brain mechanical injury with any treatment.

Material selected for histological examination after removal from the animal experiment 7,14,30 and 60 hours. Standard histological techniques were used. Morphometric treatment of histological sections performed on a computer using image analyzer software "Karra Opto-Electronics GmbH" (Germany) with 400 x magnification. Province healing of experimental brain injury was divided into two zones: the transition and long. We evaluated the specific density of neurons and glial cells, neurons quantitative assessment was conducted based on their morphology, the core area and the nuclear-cytoplasmic index intact and hyperchromatic neurons.

Results: These studies have shown an increase of reparative changes of neurons in the early stages after experimental injury mainly in the transition zone in the group II - 14. Glial component regard, we observed in the studied multidirectional reaction zones. The greatest variability of morphometric parameters relating mainly to the transition zone, whereas the morphological appearance of the transition zone reflects a mosaic of changes.

Conclusion: Allogeneic fetal neuronal tissues have positive effect on the healing process in experimental brain contusion.

Keywords: Allogeneic fetal neuronal tissues, Brain injury, Hystomorphometry

EP-0946 [Neurotraumatology and Neuro Critical Care » Others]

In Acute Subdural Hematoma Effect of Decompressive Craniectomy on Mortality

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Aim: To study the effect of decompressive craniectomy on mortality in acute subdural hematoma.

Method: We study the 76 cases that operated cause of traumatic acute subdural hematoma in our clinic between 2013-2016 years. Decompressive craniectomy, draining subdural hematoma and duraplasty to these patients. Routinely bone flap is inserted into anterior abdominal wall; after 3-6 months it replaced on skull defect.

Results: 15 case end up excitus, mortality rate is 19,7%: 12 of these patients, age is above 65; 4 -age above 80; 7patients- GKS: between 4-5, 7 patients - GKS is above 10. In postoperative follow in 1 patient hydrocephalus occur, shunt device is placed.

Conclusion: In studies that have been done (Barret at all.), rate is differ between 26-47%. In our study, this rate is 19,7%. We assume that decompression and duraplasty have better results.

Keywords: Acute, Subdural, Decompressive, Craniectomy

EP-0947 [Neurotraumatology and Neuro Critical Care » Others]

Initial Experience of Right Median Nerve Electrical Stimulation for Acute Traumatic Coma in Republic of Kazakhstan

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Background: Traumatic brain injury (TBI) is the common cause acute traumatic coma, with high rates of mortality and morbidity over the world. The recovery of patients with severe TBI is quite difficult and have social and economic aspects. Our aim is to report initial experience of Right Median Nerve Electrical Stimulation in severe TBI in the Republic of Kazakhstan.

Method: During the of 2016 year 285 patients were treated with severe TBI. According to inclusion criteria, 5 patients were selected to receive Right Median Nerve Electrical Stimulation (RMNES). We included patients according to following criteria: Admitted to the hospital due to traumatic brain injury 7 to 14 days ago; The GCS score is 4 to 8 or the GMS is below 5 on admission 18 to 65 years old. Exclusion criteria were decompensated vital signs, penetrating cranial injury, a confirmed history of epilepsy, severe cardiac arrhythmia or having pacemaker implanted, pregnancy. All patients were assessed with GOSE, CRS-R, DRS at 28 days, 3 months, 6 months after injury. Other data was collected includes GCS, GMS, FOUR at day 1, day 7 after enrollment as well as 28 days.

Results: 5 patients were selected to receive RMNES. One patient full recovered in 14 days, with GCS 15. Another patient was identified in VS in 3 months. 3 patients were diagnosed in MCS.

Conclusion: Preliminary results RMNES shows promising results in severe TBI. Assessment of further results needs enrollment of bigger group and long follow up period.

Keywords: Traumatic brain injury, Right median nerve electrical stimulation, Acute traumatic coma

EP-0948 [Neurotraumatology and Neuro Critical Care » Others]

Retrospective Analysis of 110 Cases of Chronic Subdural Hematoma that are Surgically Treated

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Background: Chronic subdural hematoma (CSDH) is predominantly a disease of the elderly, averagely seen at 63 years. Head trauma causes less than 50%. CSDH's 20-25% is bilateral.

Method: We retrospectively analysed 110 cases of CSDH surgically treated in our clinic between 2008 and 2013.

Results: Case average ages were 63,02±22,26 and gender were 82,7% men and 17,3% women. The commonest complaint was headache (%58,2). Case background was use of anticoagulant (%28,3), head trauma (%27,3) and previous neurosurgical intervention (17,3%).

Hematoma %29,1% right, 42,7 % left and 28.2% was placed bilaterally. Computed tomograph (CT) were 61.8% hipodensity, 16.4% izodensity, 10% hypo-izodensity, 10.9% as Hyperhypodensity. Preoperative hematoma thickness was 22,49±7,3mm, thickness of hematoma early postoperative was 10,35±5,10mm and late check-out thickness of the hematoma was 4,67±5,10mm. Preoperative midline shift was 5,97±3,13mm, early postoperative was 1,58±2,24mm and late check-out was 0,36±1,41mm. Glasgow coma score (GCS) was 13,30±3,14, early postop 13,76±2,45 late postop 14,48±1,35. Postoperative complications were acute subdural hematoma(2,7%), cerebral infarction (0,9%), hypertension (0,9%), ampyema (1,8%), wound infection(0,9%) and on others(6,4%). Confusion, low preoperative GCS and postoperative hematoma thickness statistical was significantly more in bilateral CSDH patient. Although it wasn't significantly different statistically, anticoagulant using, myocardial infarction and other postoperative complications were seen more in bilateral CSDH.

Conclusion: CSDH is seen more in advanced age, use of anticoagulants, hypertensives, diabetics and history of head trauma. Prognosis is worse in bilateral CSDH. Parallel to the increased elderly population, we estimate that incidence of CSDH will go up in future.

Keywords: Advanced age, Bilateral, Chronic subdural, Hematoma

EP-0949 [Neurotraumatology and Neuro Critical Care » Others]

Hyperacute Massive Epidural Hematoma as a Complication Following Puncture of Epicranial Fluid Collection After Cranioplasty with Methyl-Methacrylate. Case Presentation

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Cranioplasty is almost as ancient as trephination. Although cranioplasty is a relatively simple procedure, it has a high complication rate. We report a case of a 49-years-old male that had a subdural hematoma evacuated via decompressive craniectomy with good recovery and six months after the operation he underwent cranioplasty surgery with intra-operative hand-shaped methyl-methacrylate (MMA). Post-operative evolution of the patient was uneventful until the 4th post-operative day when we decided to do a puncture of the persistent epicranial fluid collection, and it turned into catastrophic event for us and for patient, because that provoked a huge haemorrhage from the frontal branch of the superficial temporal artery. We tried to stop it by all means applying cold, compressive bandage and blood drainage from the wound, nevertheless all measures turned up ineffective and the formation of the massive epicranial hematoma occurred. Thereby the decision was made to take patient into the operative room (OR) for hemostasis. On the way to OR the computerized tomography (CT) scan was performed in order to rule out an epidural hematoma. Notwithstanding that the patient was neurologically intact the CT scan revealed an epidural hematoma. Patient was operated, hematoma was evacuated, haemostasis performed and based on the fact that pre-operatively the patient had no any neurologic

deficits and no decline of consciousness we replaced the MMA plate. Postoperative patient recovered quickly and was discharged at one week after the last operation. In conclusion we certainly not recommend any attempt to puncture the epicranial fluid collection after cranioplasty.

Keywords: Epidural hematoma, Epicranial fluid collection, Cranioplasty, Methyl-methacrylate

EP-0950 [Stereotactic and Functional Neurosurgery » Basic Science]

Peroperative Mapping: First Year Experience

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Background: The more precise and reliable method nowadays is represented by intra-operative direct electrical stimulations (DES) of the central nervous system, which allows a safe real-time identification and hence preservation of essential pathways. This technique can provide intraoperative functional mapping at the cortical and sub-cortical brain level.

Method: All patients with low grade gliomas close to an eloquent area seen in our institution between jules 2015 and february 2017 were considered for entry into this prospective study. Patients were excluded in case of severe pre-operative deficit.

Results: There were 13 males and 4 females with an age range of eighteen to sixty years (median 35 years). Presenting symptoms were seizures in 9 cases with normal neurological examination, progressive mild deficit (2 motor deficits, 1 language disturbances). Concerning location, MRI revealed 7 central lesions, 4 frontotemporo insular lesions, 4 fronto-opercular and 2 parieto-occipital. Immediate and transitory worsening of the neurological status was observed 2 motor impairments in which 1 supplementary motor area syndrome, 3 language, 1 somatosensorial worsenings. All these patients recovered within 15 days to 3 months.

Conclusion: Direct electrical stimulations constitute an easy, reliable, precise and safe method, allowing the realization of a functional brain cortico-sub-cortical mapping useful for every surgical procedure. This technique allows minimization of definitive post-operative neurological deficit, and concurrently an improvement in the quality of lesion resection.

Keywords: Awake craniotomy, Functional areas, Mapping, Neurological status

EP-0951 [Stereotactic and Functional Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Frame- Based Stereotactic Biopsy for Brainstem Tumors: Reports of 12 Cases

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Background: Despite advances in the neuroi-maging of the brainstem, an accurate diagnosis of intrinsic lesions in this region requires tissue sampling and histological verification. In adult patients, brainstem lesions are of varied pathology and stereotactic biopsy can provide adequate tissue for diagnosis. Even in children with diffuse intrinsic pontine gliomas that often are treated based

on imaging characteristics alone, prognosis remains poor, despite aggressive chemotherapy and radiation treatments. There is therefore a need for new therapies directed by biologic profiling. This necessitates a tissue diagnosis and, therefore, surgical biopsy. This present retrospective study was aimed to evaluate the diagnostic yield and safety of SSB and its role in the further treatment.

Method: Twelve patients ranging in age from 9 to 67 years who underwent stereotactic biopsy of mass lesions of the brainstem in our department between 2007 and 2016 were retrospectively analyzed. Ten of the biopsies were approached transfrontally and two were approached via the suboccipital transcerebellar route.

Results: Pathological diagnosis was made in 11 of the 12 patients. The histologic diagnosis was astrocytoma in 7 patients, metastasis in 2, primary brain lymphoma in 1, ganglioglioma in 1 and was nondiagnostic in 1. Morbidity was limited to one patient who developed a transient diplopia; there was no mortality.

Conclusions: Despite the limited number of patients, our data suggest that stereotactic biopsy of brain stem lesions is a safe technique that can obtain adequate tissue for histological diagnosis, thus providing each patient with the best available treatment.

Keywords: Histological verification, Brain stem lesion, Stereotactic biopsy

EP-0952 [Stereotactic and Functional Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Our 10-Year Experience in the Stereotactic Biopsy of the Brain Mass Lesions

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Background: Stereotactic biopsy (SB) is a guided technic performed for the lesions on eloquent brain areas. We aimed to reveal the diagnostic reliability and the risk ratio of SB in our clinic.

Method: We retrospectively collected data of patients performed SB due to various intracranial lesions in Department of Neurosurgery, Gazi University Faculty of Medicine between February 2004 and April 2014. Patients were analyzed based on age, gender, lesion location, histopathology, and outcomes of surgery.

Results: There were 242 patients of which 60% (146 patients) was male and 40% (96 patients) was female, in a range of age between 1 and 84 years (mean age of 49 years). Mortality and morbidity rates was respectively 0.4% and 3.3%. The overall diagnostic yield was 81% (196 patients), while 19% (46 patients) had nonspecific results which didn't lead any further therapy. Among 36 patients of whom pathologies were confirmed with excisional biopsy, the diagnostic accuracy was shown in 24 patients (67%).

Conclusion: Beside low risk of mortality and morbidity, the high rate of non-diagnostic results and low rate of diagnostic accuracy are the limitations of SB, which should be improved by careful skills to obtain more specimen, sophisticated software for planning, and intra-operative pathological examination for guaranteeing.

Keywords: Stereotactic biopsy, Brain tumor, Neurosurgery

EP-0953 [Stereotactic and Functional Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

High Frequency Sulcomyelotomy the Central Sulcus (DREZ) in Patients with Pre - and Postganglionic Lesion of the Spinal Cord

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High frequency sulcomyelotomy (DREZ) was performed for 17 patients with severe neurogenic pain syndrome, including 13 patients with preganglionic lesions of the spinal cord after brachial plexus injury (avulse roots) and 4 patients with a postganglionic lesion of the spinal cord (postmastectomy pain syndrome). Diagnostic algorithm of examination of patients with severe neurogenic pain syndrome consists of pain assessment at the pain card Dreval, short McGill pain questionnaire (MPQ) and visual analogue scale (VAS); depression and anxiety patients were evaluated by Hamilton Rating Scale for Depression (HRSD), Hamilton Anxiety Rating Scale (HAMA), Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS). Additional diagnostic methods which were also carried out for all patients included x-rays of the cervical spine, MRI cervical spine, ultrasound, ENMG of the brachial plexus. Observed higher efficacy of surgery in patients with preganglionic lesions of the spinal cord. In order to assess the effectiveness of surgery and reduce postoperative complications the need to use intraoperative monitoring of spinal motor and sensory functions noted. The main postoperative complications were temporary in nature, were expressed in violation of proprioceptive sensibility and slight paresis in the ipsilateral limbs.

Keywords: DREZ, Sulcomyelotomy, Severe neurogenic pain syndrome

EP-0954 [Stereotactic and Functional Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

How to Improve the Performance of a Stereotactic Biopsy?

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Background: A weakness of the technique “Biopsy with Stereotactic Technique” is the percentage of cases that can not be diagnosed called “Failure”, Published series speak of failures between 2 - 11% of cases.

Method: We analyzed a retrospective series (n: 326), with similar technique, in two different institutions: Clínica Alemana (CA) where most of the cases were done with intraoperative biopsy (56/12) and Institute of Neurosurgery (n 256) where the majority had no intraoperative biopsy (163/93). All the cases in CA were made occupying also planning software that allows to merge images and to plan path. All cases have postoperative CT.

Results: In the CA, 56 operations were performed with BI of a total of 68, in these cases only 2 failed cases (3.5%) were presented, at the

other end they were the group of cases made in INCA without BI where they were obtained 24 failed cases (14.7%). Of the 93 cases made with BI in INCA, there were 9 failed cases (9.5%). In relation to complications, only one case of this series died due to massive hemorrhage, 8 cases with transient neurological deterioration, 1 case of post-meningitis, without significant difference between the two series. The odds ratio was 4,66 a favor to the cases with the CA technique.

Discussion: Having the possibility of intraoperative biopsy significantly improves the performance of the definitive biopsy in the technique of a Stereotactic Biopsy and should be considered a standard. Having planning software could improve accuracy and reduce risks of complications.

Keywords: Stereotactic biopsy, Intraoperative complications, Biopsy no diagnostic

EP-0955 [Stereotactic and Functional Neurosurgery » Surgical Technique (Incl. Neuroendoscopy)]

Microvascular Decompression of Medically Refractory Trigeminal Neuralgia

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Background: We have analyzed perioperative and short-term clinical outcome data of 55 patients with medically refractory trigeminal neuralgia after microvascular decompression.

Method: 55 patients with classic trigeminal neuralgia were observed in 2010-2017. Microvascular decompression was performed in all cases. There were 32 female and 23 male. Mean age was 59 years (37 -82 years). In most cases pain was localized on the right side, V2 and V3 roots were affected more often. Pre and postoperatively severity of the pain was evaluated by Barrow Neurological Institute Pain Scale.

Results: After surgery significant improvement of pain scores was achieved in all patients. Complications were observed in two (2) cases. Cerebellar swelling was occurred in one case and suboccipital decompression was performed. In another case VII and VIII nerves palsy were developed which significantly recovered in a three month. In a follow-up period (up to 2 years) 3 reoperation was performed. During the follow-up period in 49 cases (89%) Barrow Neurological Institute Pain Scale score was 1 or 2, in 6 cases (11%) score was 3.

Conclusion: Microvascular decompression is a highly effective procedure for the treatment of classic trigeminal neuralgia.

Keywords: Trigeminal neuralgia, Microvascular decompression, Medically refractory trigeminal neuralgia

EP-0956 [Stereotactic and Functional Neurosurgery » Radiosurgery]

Bevacizumab Used for Perilesional Edema After Cyberknife Radiosurgery

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Perilesional edema is a complication after Stereotactic radiosurgery. The VEGF has been generally accepted as a factor of perilesional edema. Bevacizumab, a monoklonal antibody against VEGF, has been used in treatment of recurrent glioblastoma. We used bevacizumab for AVM patient for symptomatic perilesional edema after SRS. 41-year old man applied with epileptic seizures. He was treated for an arteriovenous malformation, on the vertex and left side of parietal lobe. It was measured 16x12x20 mm and It had drained mainly to superior sagittal sinus. After 12 months, he has started to have seizures. He had hemiparesia on his right side. There was severe edema on the left frontal and parietal lobe on the computer tomografi(CT) scan. His symptoms were resistant to high dose steroids. After the patient was admitted to clinic, bevacizumab infusion has strated as 2,5 mg/kg dosage. No side effect was observed. Two weeks later after giving bevacizumab as 7,5 mg/kg dosage, the patient's symptoms decreased dramaticly. The AVM was draining to superior sagittal sinuse and placed parasagittal location. Because of wide sinuse drainage, perilesional edema was likely to occur. Bevacizumab should be given by experienced clinics. We didn't meet any complications with this patient. Dispite of side effects, cost and difficulties to reach, Bevacizumab can be used by AVM patients who have perilesional edema after stereotactic radiosurgery and suffer from treatment-resistant neurological defisits, head ache, resistant seizures that don't respond to high dose dexametasone treatment.

Keywords: Cyberknife, Perilesional edema, Bevacizumab

EP-0957 [Stereotactic and Functional Neurosurgery » Radiosurgery]

Quantitative Analysis on the Changes in Peritumoral Lesion in Patients with Metastatic Brain Tumor Treated with Stereotactic Radiosurgery

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Aim: To verify changes in diffusion tensor imaging (DTI) factors in patients with metastatic brain tumors treated with stereotactic radiosurgery (SRS). We also explored correlations of changes in tumor volume with mass effects and variations in DTI values in peritumoral lesions.

Method: A total of 28 patients with metastatic brain tumors who had undergone SRS between March 2014 and December 2015 were enrolled in this study. Magnetic resonance imaging with DTI factors, such as fractional anisotropy (FA) and apparent diffusion tensor (ADC) value, was performed one day before the procedure and three months after the procedure. DTI data at tumor lesions, edema lesions, and 12-Gy dose lesions were measured.

Results: Tumor volume ($p = 0.001$), edema volume ($p = 0.076$), and ADC values were significantly decreased after the procedure in 12-Gy dose lesions ($p = 0.018$) and edema lesions ($p = 0.003$). Differences in tumor volume were only significantly correlated with differences in edema volume ($p = 0.014$). Edema volume was significantly correlated with FA values of 12-Gy dose lesions ($p < 0.001$) and edema lesions ($p = 0.018$), as well as with ADC values of 12-Gy dose lesions ($p = 0.010$) and edema lesions ($p = 0.025$).

Conclusion: It was possible to quantify changes in peritumoral lesions in patients with metastatic brain tumors after SRS, by using DTI. ADC values of peritumoral lesion decreased significantly after SRS, while FA values showed a non-significant increase.

Keywords: Diffusion tensor imaging, Stereotactic radiosurgery, Brain tumor, Metastasis

EP-0958 [Stereotactic and Functional Neurosurgery » Neuromodulation and Pain]

The Features of Surgical Treatment of Recurrent Trigeminal Neuralgia in Older Patients

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Background: The improvement of the results of surgical treatment in older patients with recurrent trigeminal neuralgia (TN) is still actual problem of neurosurgery.

Method: In our research the analysis of treatment of 180 patients with recurrent TN in 1996-2015 years was performed. Males/females – 1:1,36. The age was 60-85 years (median age was 75.6±2.1). Median time of anamnesis was 7.8±2.13 years. The right trigeminal nerve was involved in 54% of patients, left in 45%, bilateral type in 1%. Percutaneous procedures (cryoneurotomy, percutaneous balloon microcompression, radiofrequency rhizotomy etc.) were executed in 82%, gamma knife radiosurgery in 1%, and microvascular decompression (MVD) in 17% patients younger than 70 years. The median follow-up was 27±3,1 months.

Results: The 1 year pain-free interval was in 48% patients, up to 3 year in 41,8%, more than 3 year in 10,2%. The symptoms of recurrent TN in 80,6% were the same. In 19,38% of patients were increasing of severity and character of pain with etiology of recurrence in 2,7% - brain tumors, 1,1% - vascular malformations, 0,8% - viral encephalitis, 2% osteomyelitis of mandible. Medical therapy was effective in 48% of cases of recurrent NT, cryoneurotomy in 39%, other percutaneous approaches in 21%, radiosurgery in 0,5%.

Conclusion: Full examination with MRI and MRI-AG must be done in cases of recurrent TN in older patients. Percutaneous approaches were more effective in older patients with recurrent TN. They were easily executed, have few complications, provides symptomatic relief of trigeminal pain and effective when previous MVD was failed.

Keywords: Recurrent trigeminal neuralgia, Old patients, Cryoneurotomy, Percutaneous approaches

EP-0959 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Our Functional Results of Deep Brain Stimulation Surgery in Parkinson Disease

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Background: Severe skill, gait and emotional problems (frequently resistant to optimal medical treatment) often seen in Parkinson disease (PD). Even several years after initiation, the deep brain stimulation surgery (DBS) could be very effective for controlling these symptoms. However, there aren't so much long-term data on the evaluation of fine motor skill, mobility, balance, walking ability and fall risk after DBS.

Method: 25 patients who underwent to Subthalamic Nucleus DBS in Mustafa Kemal University Neurosurgery department between May 2016 and January 2017 were evaluated and 11 patients with a mean age of 47.62 ± 7.53 years were included in the study. The first assessment was made before the DBS when medication is on. Fine motor skills were examined by Nine-Hole Peg Test (NHPT), mobility, balance, walking ability, and fall risk evaluated by Timed Up and Go Test (TUG) and the depression level evaluated by the Beck Depression Inventory (BDI). The second evaluation was made 10 days after the surgery when medication and stimulation on.

Results: We didn't find statistically significant difference between the pre-operative and post-operative results in NHPT tests ($p > 0.05$). We found statistically significant difference in TUG test results ($p = 0.042$), (pre-operative median = 10 s, post-operative median = 8 s) and in BDI results ($p = 0.021$, preoperative median = 11, postoperative median = 6).

Discussion: Patients' pre-operative NHPT results are about normal grades, we think we didn't find difference for this reason. Patients' mobility, balance, walking ability were better and fall risk were lower after DBS. Patients mood were better after DBS and they were hopeful about their future.

Keywords: Deep brain Stimulation, Gait, Depression, DBS, STN, TUG

EP-0960 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Normalization of Motor Symptoms and Quality of Life After GPi-GPe Stimulation in a Young Patient at an Early Stage of Huntington's Disease - Is Waiting Justified?

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Huntington's disease is a fatal autosomal-dominant neurodegenerative disorder characterized by movement, cognitive and psychiatric impairment. Deep brain stimulation is now becoming more widely accepted as a safe and efficient treatment for chorea-predominant form of the disease. Following first publication, GPi was used in gross majority of cases, generally at the advanced stage of the disease. Only recently STN and GPe has been investigated. We present a case of bilateral combined GPi-GPe stimulation in a 32-year-old women with early phase chorea-predominant HD. The patient was operated on without systemic sedatives using microelectrode recording and macrostimulation to

intraoperatively ascertain optimal therapeutic effect. Chronic DBS almost completely abolished choreic movements. The effect was sustained after 18 months of follow-up with a marked improvement in quality of life and a mild - in cognition. There were no adverse events. The present case report confirms that bilateral multitarget (GPi-GPe) DBS may be effective in well-selected patients with early-stage chorea-predominant HD, aimed to optimize control of motor symptoms without increasing surgical risk. Future controlled studies need to confirm if the observed additive beneficial effect indeed represents a new therapeutic option. The authors proposed combined GPi-GPe stimulation with single quadripolar electrode. Depending on symptomatology, GPe, GPi or both may be stimulated with varying current parameters. This gives better opportunities for optimal programming without increasing the surgical risk. Importantly, the observed improvement included also cognitive and psychiatric symptoms. This is in line with studies on GPe-DBS in HD, and in contrast with reported GPi-DBS cases.

Keywords: Huntington's disease, Deep brain stimulation, Neuromodulation, Globus pallidus internus, Globus pallidus externus, Chorea

EP-0961 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Trigeminal Neuralgia: Clinical Characteristics, Classification and the Role of Neurovascular Compression

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The International Headache Society (IHS) divides Trigeminal Neuralgia into two distinct categories: "classical" and "symptomatic" (secondary). By these definitions, "classical" TN includes those patients in which no identifiable cause can be found for their TN other than a vascular compression of the trigeminal nerve. "Symptomatic" TN describes those patients in which an identifiable cause can be found, other than a vascular compression, such as a tumour, arteriovenous malformation or multiple sclerosis (MS). In our classification, Type 1 Trigeminal Neuralgia (TN1) is akin to "classical" TN, and in patients with spontaneous, but predominantly constant pain, the term Type 2 TN (TN2) is used; the difference being that this method classifies TN on a purely patient-driven historical basis. Patient self-diagnosis has been enabled by an anonymous on-line expert system which allows individuals to answer basic historical questions, and arrive at a diagnosis with high sensitivity and specificity. This diagnostic method has also shown a high degree of correlation with the results of high-resolution imaging in TN patients, and has allowed classification of TN patients for on-going genomic testing. The combined conclusion of this classification system, our expert system for diagnosis, and high-resolution imaging have led us to the conclusion that neurovascular compression (NVC) is only one potential correlate of TN, and specifically that younger patients (< 40) have all aspects of TN1, but almost never have NVC. Trigeminal neuralgia may, in fact be a syndrome with multiple causes. This conclusion clearly drives the possible surgical treatment of patients with TN.

Keywords: Facial pain, Trigeminal neuralgia, Type 1 & 2 trigeminal neuralgia

EP-0962 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Unexplained DBS Electrode Impedance Normalization Following Extremely Low Measured Intraoperative Values: Case Report

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Hardware-related problems rank high among complications encountered in DBS procedures. Electrodes in particular are delicate components, prone to damage during surgical handling or due to trauma to its extracranial segment. One of the commonly performed system integrity tests is the electrode impedance measurement, with high values possibly indicating broken wires/open circuit and very low values (<50 ohm) suggesting a short circuit. Some postoperative mild fluctuation is expected, impedance usually falling somewhat in the weeks that follow surgery. We describe the case of a patient submitted to bilateral GPi stimulation due to generalized dystonia, in which impedance in the right electrode at the end of surgery ranged from 26 to 72 ohm, while it was around 1500 ohm in the left electrode; all connections were immediately revised, disclosing no physical damage. Testing was performed both on the IPG and in the electrode itself, with perfectly similar values. Since there was no possibility of substituting the electrode in the same surgery, the system was left in place. Surprisingly, on the third post-operative day, measured impedances were 500 ohm on average and the next day they were 770 ohm; we started stimulation with the electrode and it was fully functional, with obvious clinical benefit. We are now working with the system supplier to understand the reason behind such measurement fluctuation; we know of no similar case, but this warns against relying heavily on measurements taken in a single time frame and to make decisions based solely on those.

Keywords: DBS, GPi, Electrode malfunction, Hardware malfunction, Hardware-related problems

EP-0963 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Clinical Outcomes of Asleep Versus Awake Deep Brain Stimulation for Parkinson's Disease

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DBS for Parkinson's Disease, has traditionally been performed awake using microelectrode recording to confirm accurate placement of electrodes. DBS candidates with PD referred to Oregon Health & Science University underwent asleep DBS using micro-electrode and image guidance. 62 subjects underwent asleep DBS using iCT and 39 subjects underwent awake DBS using MER guidance. No significant difference was observed in the change of motor UPDRS (14.5±9.9 point improvement in asleep DBS,

17.6±12.3 point improvement in awake DBS, $t=1.24$, $p=0.222$) or UPDRS II score (9.3±2.7 point improvement in asleep DBS, 7.4±5.8 point improvement in awake DBS, $t=1.75$). Improvement in ON time without dyskinesia was superior in the asleep DBS group (+6.4 hours/day versus +1.7 hours/day, $p=0.04$). Quality of life scores significantly improved in both the asleep and awake groups (17.7±15.7 and 8.9 ±11.5 points respectively), with improvement in the total score ($p=0.004$) and subscores for cognition ($p=0.002$), communication ($p<0.001$) and emotional well-being ($p=0.03$) being superior in asleep DBS. Speech fluency outcomes were superior in asleep DBS (category fluency 3.66±11.9 point improvement versus 6.31±9.7 point decline, $p<0.001$; phonemic fluency 0.18 ±10.6 point improvement versus 5.5 ±9.6 point decline, $p=0.023$). The dementia rating scale remained stable without significant change in both the asleep and awake cohorts ($p=0.44$).

Asleep DBS for PD with intraoperative image guidance improved motor outcomes over 6 months that were equivalent to, or better, than awake DBS, and superior with regard to speech fluency and quality of life. Serious adverse events were uncommon in both groups.

Keywords: Deep brain stimulation, Parkinson's disease, Asleep, Awake, Outcome

EP-0964 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Confirmation of Electrode Localization with Fusion of Postoperative CT and Preoperative T2W MRI on Parkinson's Disease Patients Who Underwent DBS of the STN

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Background: Deep brain stimulation (DBS) of the subthalamic nucleus (STN) is advisable procedure for appropriate Parkinson's Disease (PD) patients. The success of the procedure is dependent on the appropriate patient selection, meticulous surgical planning and implantation technique. The dorsolaterally STN can be visualized with T2W MRI for direct targeting in the preoperative stage. Permanent electrode localization can be confirmed with T2W axial MRI in the postoperative stage as well. However, the most of DBS systems are incompatible with MRI. In our study, we would like to show that fusion of early postoperative CT and preoperative T2W MRI could be used for confirmation of permanent electrode localization in the STN.

Method: This study included 16 advanced Parkinson's Disease (PD) patients who underwent DBS of the subthalamic nucleus (STN). The dorsolateral motor part of the STN was defined by direct targeting on T2W MR images in the preoperative stage. All DBS surgeries have been performed under local anesthesia with microelectrode recording and test stimulation. In the early postoperative period, CT scan was performed in the all patients and pulse generator implantation was performed under general anesthesia following

CT and preoperative MRI fusion confirmation of the permanent electrode localization on the work station (Framelink 5, Medtronic Inc).

Conclusion: The correct implantation of the permanent electrode of STN DBS procedures is directly related with good clinical outcome. The fusion of early postoperative CT and preoperative T2W MRI can be used for confirmation of permanent electrode and contacts localization easily, rapidly and safely.

Keywords: Deep brain stimulation, Electrode localization, Parkinson's disease, Subthalamic nucleus

EP-0965 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Bilateral Subcortical Peri-Electrode Edema Following GPi Deep Brain Stimulation Surgery: Case Report

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Deep Brain Stimulation is a well established and important treatment for several brain disorders, namely movement disorders. Although some complications such as hemorrhage and infection are known to occur at predictable rates, a much rarer and intriguing finding is that of non-infectious transient peri-electrode edema surrounding DBS leads. We describe a case of bilateral peri-electrode edema, diagnosed on post-operative (72h after surgery) CT scan, in a 23 year-old patient submitted to bilateral GPi stimulation due to generalized dystonia secondary to PANK 4 deficiency. The patient was fully asymptomatic and stimulation was successful in alleviating dystonia. Peri-electrode edema presented as a hypodense area of approximately 2,5cm diameter in the subcortical region bilaterally, with no contrast enhancement. There were no local inflammatory signs and no systemic infectious markers. Patient course was uneventful and serial imaging showed progressive weaning and full resolution of the edema. Literature review disclosed 25 cases of reported peri-electrode edema; in only one of them was the edema bilateral and, in such case, the area was much smaller and in a deeper location; the usual imaging characteristics are non-enhancing hypodensity on CT and hyperintensity on T2 MRI. Patients are usually asymptomatic or can present with headache, local pain/tenderness or even seizures. Treatment options are observation with or without steroid and the course is usually benign. Our case is the first reported with bilateral subcortical peri-electrode edema and demonstrates the importance of early post-operative imaging, even in asymptomatic patients.

Keywords: DBS, GPi, Bilateral subcortical peri-electrode edema, Peri-electrode edema

EP-0966 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Electromyography During Stereotactic Pallidotomy and Thalamotomy for Parkinson's Disease

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In stereotactic pallidotomy and thalamotomy for Parkinson's disease, care must be taken to avoid internal capsule injury while maximizing improvement of rigidity and tremor. In 20 patients, intraoperative electromyography (EMG) was used to assess stimulation thresholds required for capsular responses and to monitor muscle tone and tremor. Depth EMG electrodes were placed on the face and multiple muscle groups of the extremities. The stimulation and lesion electrode was introduced via MRI-guided stereotaxis toward the VIM or GPI. Exact targets were modified according to MRI-visualized anatomy. With stimulation at 5 and 50 Hz, thresholds for detection of EMG responses were usually seen at 4–5 mA. EMG responses were consistently seen prior to visual observation of muscle activity. Timing of EMG response relative to stimulus aided in localizing the target and differentiating stimulus-related movement from spontaneous tremor. Resting spontaneous EMG activity was seen to decrease as rigidity was improved by incremental lesion production. EMG activity related to tremor was recorded; tremor decrease by lesion production was documented by EMG recording.

Keywords: Parkinson's, Thalamotomy, Pallidotomy

EP-0967 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Impact of L-Dopa Dysregulation on Deep Brain Stimulation Outcome

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Our aim is to emphasize the negative impact of L-dopa dysregulation on deep brain stimulation (DBS) surgery. A fifty-two year old man with Parkinson's disease diagnosis that was dominant in the right side has been followed-up for six years. He worked as the executive manager of a company and sometimes had to make connections and as he stated "he had to look all right in every aspect" during these meetings. Therefore, he was taking L-dopa in high doses (Stalevo 200 mg every 2 to 3 hours for four or five times in approximately 12 hours). When he was off work (usually after 5 o'clock) he did not take any pills. But he had remarkable dyskinesia at that time. Subthalamic nuclei were targeted and we recorded remarkable decrease in his tremor, dyskinesia and rigidity. L-dopa use was diminished by 90%. However, he began limping in the right side. There was no pain, but he was unable to control his leg, therefore could not walk without aid. We ponder that using L-dopa with improper intervals and doses caused intolerance to steady stimulation. When we put the pulse generator off, he was able to move smoothly. We reprogrammed and added L-dopa. Combination was more successful. In Parkinson's disease, candidates for DBS surgery should take their medication in a regular and steady basis to prevent receptor response alterations. Otherwise it will take longer to adjust an efficient pulse program and ruling out capsular side effects will be harder.

Keywords: Parkinson's disease, L-dopa, Deep brain stimulation, Subthalamic nucleus, Dysregulation

EP-0968 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Treatment Perspectives Using Deep Brain Stimulation in Patients with Parkinson's Disease in the Republic of Moldova

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Parkinson's disease (PD) is a frequent neurological disorder with a prevalence of about 1 to 1000, which may be up to 1 in 200 in the elderly. With disease progression, drug therapy becomes less effective, patients develop tolerance to the treatment and there are various other complications such as dyskinesia and motor fluctuations significantly altering physical and mental condition of the patient. This requires the use of an alternative treatment, the most effective currently considering DBS (deep brain stimulation). DBS is a routine treatment method developed and demonstrated as one of the best treatment of various neurological disorders including PD. Given the high rate of failure of modern medical treatment and the lack of this method of treatment in Moldova at present, we proposed the following purpose of the work: research of treatment perspectives using deep brain stimulation in patients with Parkinson's Disease and determining candidates for this method of treatment based on the patients database of the Institute of Neurology and Neurosurgery. The study included analysis of 130 records of patients with PD admitted to the Institute of Neurology and Neurosurgery in 2012-2013. 44 articles were analyzed from the database PubMed that included information about criteria for patient selection for DBS and future perspectives of this method in the treatment of Parkinson's disease. The performed clinical analysis of 130 consecutive PD referrals showed that 24 patients (18.46%) are good candidates for deep brain stimulation.

Keywords: DBS, Deep brain stimulation, Parkinson disease, Candidate, Moldova

EP-0969 [Stereotactic and Functional Neurosurgery » Movement Disorders]

Wound Problem After Deep Brain Stimulation Surgery in Cachectic Person

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Deep brain stimulation (DBS) is an accepted surgical method for medically refractory Parkinson's disease, essential tremor and dystonia. The standard targets are globus Pallidus interna, subthalamic nucleus and ventral intermediate nucleus. The implant infection (Pulse generator, leads or extension cables) is an undesirable complication, as it is difficult to manage and can increase patient morbidity. Infections may require removal of some of the implanted equipment. The incidence of the DBS-related infections can be reached up to 22%.

39 years old cachectic type woman with bilateral DBS electrodes 2 extension cables and one subclavicular generator, admitted to our outpatient clinic with wound dehiscence on subclavicular area. Wound exploration revealed serous material. The implanted generator and extension cables were removed. The cultures were negative. The patient was sent home with antibiotics, after two weeks when the pertinent laboratory examinations were negative the generator were implanted in subcostal area and new extension cables were implanted to. It is acknowledged that the cachectic states is commonly associated with malnutrition and the malnutrition may cause impaired wound healing. The subcostal area should be kept in mind especially in cachectic persons for implantation of pulse generator.

Keywords: Cachexia, DBS, Parkinson, Wound problem

EP-0970 [Stereotactic and Functional Neurosurgery » Epilepsy]

Amygdalo-Hippocampectomy for Refractory Mesial Temporal Lobe Epilepsy: A 10-Year, Mono-Institutional Experience

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Background: Mesial temporal lobe epilepsy is the most common form of human epilepsy for which surgery has become the standard of care. Amygdalo-Hippocampectomy is suggested to be a safe and effective surgical procedure with the advantage of a better cognitive outcome.

Method: 15 cases of medically intractable mesial temporal lobe epilepsy with hippocampal sclerosis were operated on at Fattouma Bourguiba University hospital between June 2006 and December 2010. Candidates for surgery were determined as those with concordant clinical characteristics, ictal recordings and imaging findings.

Results: In our study, there was no mortality or major neurological or surgical complication related to surgery. Minor complications occurred in 13.3 % of all cases with full recovery few weeks after the intervention. 73.3 % of patients were seizure free at the last follow up and overall, good surgical outcome defined as Engel I or II ranking, was up to 80%. 63.6% had stopped antiepileptic drugs and another 9% decreased the number of medications. 54% of patients with pre-operative depressive humour improved well after surgery.

Conclusion: Amygdalo-Hippocampectomy is a safe and effective surgical procedure for patient with intractable mesial temporal lobe epilepsy.

Keywords: Epilepsy, Functional surgery, Temporal

EP-0971 [Stereotactic and Functional Neurosurgery » Epilepsy]**Surgical Treatment of Refractory Epilepsy in Federal Centre of Neurosurgery (Tyumen, Russia)**

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Aim: To present the experience of surgical treatment of epilepsy in Federal Centre of Neurosurgery (FCN) in Tyumen.

Method: This is a retrospective analysis of 178 cases of refractory epilepsy treated surgically in FCN.

Results: Mean age of patients of the cohort was 20.17±1.99 years, with mean disease duration of 17.2±2.49 years. Average seizure frequency was 17.2 (1-450 per month). Mean number of antiepileptic medications taken by patients by the moment of admission was 3.7. The patients of the cohort group underwent the following surgical procedures: temporal lobectomy in 37 cases; a selective cortical topectomy of the epileptogenic focus in 12 cases; functional hemispherectomy in 12 cases; functional quadrantectomy in 2 cases. In 30 cases, callosotomy was performed, in 73% of these cases (n=22), callosotomy was supplemented by endoscopic commissurotomy, in 2 cases endoscopic corpus callosotomy was performed. Once endoscopic frontal commissurotomy was done. Sixty-four patients had vagus nerve stimulators implanted for a long-term treatment; in 5 cases, stereotactic implantation of the system for long-term stimulation of the frontal thalamic nuclei on both sides was performed; in 15 cases, electrodes for intracranial EEG monitoring were implanted. In 84 % of cases, frequency and the severity of seizure attacks in the postoperative period reduced. All the patients continued to take anti-seizure medications.

Conclusion: Surgical treatment is an effective treatment method for refractory forms of epilepsy. Surgical intervention in young age may significantly improve the disease outcome, cognitive development, and social adaptation of the children.

Keywords: Epilepsy, Refractory epilepsy, Surgical treatment

**EP-0972 [Stereotactic and Functional Neurosurgery » Others]
Radiological and Histopathological Analysis of the Stereotactic Brain Biopsy Patients: Retrospective Review**

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Background: Stereotactic biopsy is a minimal invasive procedure and less traumatic than craniotomy. It is more associated with low rate complications of haemorrhage, seizure, infection than craniotomy. Clinical studies have reported the incidence of

complications and the morbidity rate associated with stereotactic biopsies to be 0.7 and 17.2%, respectively. In this study, we evaluate the radiological and histopathological data of the brain lesions underwent stereotactic biopsy.

Method: The Leksell Stereotactic System was used during target selection and computed tomography guided technique was utilized. All patients were evaluated by the same pathologist and neurosurgeon. The studied parameters were age, gender, histopathologic evaluation, CT-MRI findings (such as lesion's localization, contrast enhancement, whether it is single or multiple).

Results: The study group is comprised of 56 patients included 18 female, 37 male and 1 child. The mean age of all patients was 56.7 years (range, 6 to 85 years). The data of patients who were pathologically diagnosed (52/56, 92.9%) and misdiagnosed (4/56, 7.1%) were compared.

Conclusion: Stereotactic brain biopsy is an effective way to obtain the minimally invasive diagnosis of brain lesions with low rate of complications. Targeting in cases of image-guided stereotactic brain biopsy is generally directed on the contrast-enhanced part of the lesion. If contrast enhancement is absent targeting should be at its center. Heterogeneity of the neoplasm may cause misdiagnosis. We discuss radiological and histopathological data of the misdiagnosed stereotactic biopsy performed lesions.

Keywords: Brain lesion, Frozen, Pathology stereotactic biopsy

**EP-0973 [Stereotactic and Functional Neurosurgery » Others]
Bilateral Stereotactic Amygdalectomy in the Treatment of Aggression Conchy to Conservative Treatment: Case Report and Literature Review**

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The psychosurgery can be defined by the World Health Organization as a selective surgical removal or destruction of nerve pathways in order to influence the behavior. At the present time, they are performed in severe cases or refractory to conservative treatment. The most common disorders treated with psychosurgery involve Anxiety Disorder, Affective Disorders, Obsessive-Compulsive Disorder and the procedures performed are Cingulotomy, Subcaudate Tractotomy, Anterior Capsulotomy, and Limbic Leukotomy. The surgery for aggressiveness has had good results according to the works raised. The Brazilian Federal Council of Medical's resolution 2057/2013, in short, ensures that the psychiatric patient has the appropriate therapeutic resources, with his or her informed consent or a responsible person. We report a case of a 28-year-old patient diagnosed with profound mental retardation and aggressive behavior refractory to conservative treatment. We performed Bilateral Stereotactic Amygdalectomy and after 3 years of follow-up, patient remains without presenting aggressive outbreaks. Technical advances in neurosurgery and better understanding in neurophysiology has increased the procedural safety margin, yet debates surrounding the ethical implications have been discussed by multidisciplinary team.

Keywords: Psychosurgery, Aggressiveness, Behaviour disorders, Stereotactic amygdalectomy

**EP-0974 [Stereotactic and Functional Neurosurgery » Others]
Developing Stereotactic Brain Lesion and DBS Program in Indonesia**

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Indonesia is the fourth's most populous country in the world with more than 250 million people, Indonesia has just started the first DBS implantation in 2014. It was begun 2012, when Department of Neurosurgery, University of Airlangga/Dr Soetomo Hospital Surabaya sent dr Achmad Fahmi to learn about surgery for Movement Disorder in Tokyo Woman's Medical University (TWMU) Hospital in Tokyo. He learned from Prof Takaomi Taira and his team. After completion of fellowship, he went back to Indonesia and found that there was no single equipment available in Surabaya for movement disorder's stereotactic surgery. Despite these obstacles, campaign and public education about PD, movement disorders, and surgical intervention were initiated. Until 2013, the first time stereotactic frame (Inomed ZD) came to our center. The end of 2013, National Hospital Surabaya bought the Leksell Stereotactic Systems. The services of functional neurosurgery especially in movement disorders started regularly, mostly brain lesioning. With the support of Prof Taira who visited our center several times, attended national cadaveric workshop and symposium in functional neurosurgery, performed live surgery for PD, the functional neurosurgery services grew up rapidly and influenced other neurosurgeon to learn functional neurosurgery. Then we started to perform DBS implantation. Until February 2017, we have performed 131 stereotactic brain lesion and 5 DBS implantation. We also helped to establish functional neurosurgery services in Jakarta and Semarang, However the support from international society especially World Society for Stereotactic and Functional Neurosurgery (WSSFN) is needed to expand the services, educations and researches.

Keywords: Functional neurosurgery, Indonesia, Brain lesioning, DBS

**EP-0975 [Stereotactic and Functional Neurosurgery » Others]
The Globus Pallidus Internus as a Reasonable Target for the Treatment of Uncontrollable Aggressiveness, and Self-Injury**

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The pharmacological treatment is not always sufficient to control aggressiveness, including self oriented aggressiveness as self-injury. We assess the role of GPi as possible useful target in the surgical treatment in two patients. We report the results of two patients undergoing surgery for dystonia, the first one secondary to Lesch-Nyhan syndrome and second one carrier of severe OCD and dystonia secondary to neuroleptics. Both patients additionally

presented a picture of irreducible aggressiveness. The GPi is closely related to extrapyramidal motor control. For this reason it has become the target of choice for the treatment of dystonia while maintaining an important role in the control of symptoms associated with Parkinson's disease. Some reports communicate the good response in the management of aggressiveness after surgery on the GPi as an additional effect. This beneficial effect has been observed in the follow up of the two patients operated by our team. We consider it is real important to further study the role of GPi as a potential target in the treatment of aggression.

Keywords: GPi, Aggressiveness, Lesch-Nyhan syndrome, Obsessive compulsive disorder, Dystonia, Functional neurosurgery

**EP-0976 [Stereotactic and Functional Neurosurgery » Others]
Use of Bilateral Caudate Nuclei Deep Brain Stimulation for the Management of Refractory Tinnitus: Case Report**

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Tinnitus is an auditory disorder characterized by internal perception of sound in the absence of mechanical stimuli. Various approaches have been used to improve the symptoms. Deep brain stimulation is proposed for the management of refractory tinnitus. The caudate nucleus does not make part of the auditory pathway but makes part of the striatum and its stimulation may diminish the intensity of the tinnitus. This is a 39 year old male who started to have symptoms from 2014 with bilateral severe tinnitus and worsening in the last few months despite medical treatment. The tinnitus affected his daily living. Residual inhibition acufenometry showed residual inhibition of 4 Hz tones at 45 db on the left ear and 60db on the right ear without suppressing the tinnitus. Tinnitus index was 72(severe). The patient was doing surgery with standard technique for placement of the electrodes at the locus of caudate nuclei. We did microregistry and stimulation during surgery with improvement tinnitus. The latest stimulation parameters included -11 at 100% 9mamp, 90msseg, 185 Hz on the right nuclei and -2 at 100%, 3mamp, 90 msec, 185 Hz on the left nuclei. At 5 weeks, follow up tinnitus index was 20 (mild) The patient showed improvements at work and family life. Follow up audiometry was normal showing an acufenometry of 6db bilaterally. The present case, along with those reported by Larson and Chung demonstrating improvement of tinnitus with deep brain stimulation of the locus caudate nucleus when other medical interventions have failed.

Keywords: Tinnitus, Deep brain stimulation, Locus caudate nucleus

EP-0977 [Stereotactic and Functional Neurosurgery » Others] CT-Guided Stereotactic Biopsy in Intracranial Lesions: Our Retrospective Clinical Results

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Background: Stereotactic biopsy has widely used the diagnosis of intracranial lesions because it is easy, it can be applied under local anesthesia, it is highly successful in tissue sampling, and it has low complications rates. We have been performing CT- and MRI-guided stereotactic biopsy in our department since December 2014. In this study, we retrospectively evaluated patients underwent stereotactic biopsy and biopsy results.

Method: CT-guided stereotactic biopsy was performed by using Micromar stereotactic frame system in 3 female (33.3%) and 6 male (66.7%) patients aged between 15 to 79 years (mean: 51,78 ± 23,79 years). All biopsies were taken under local anesthesia except two patients who were operated under general anesthesia.

Results: Neoplasia was detected in all patients in the histopathological investigation. Five patients (66,7%) had a high-grade glial tumor, two (22,2%) had a low-grade glial tumor, and one (11,1) had lymphoma diagnosis. No complication was observed in the patients. Stereotactic biopsy was performed in 6.7% of all patients with intracranial mass in our department.

Conclusion: Our results show that CT-guided stereotactic biopsy is a safe procedure in patients with intracranial lesion in whom the histopathological diagnosis is essential in the management of the disease.

Keywords: Stereotaxis, Biopsy, Brain tumor

EP-0978 [Stereotactic and Functional Neurosurgery » Others] MRI-Guided Stereotactic Biopsy

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Aim: To determine the relationship between the radiological and histopathological distribution of the cerebral lesions diagnosed with stereotactic biopsy procedure and its outcomes.

Method: In the current study, a retrospective analysis of 83 patients underwent the stereotactic biopsy in our clinic from 2011 to 2015 was made. T1-weighted contrast-enhanced cranial MRI examinations were performed on patients that Leksell stereotactic frame system was installed on. Three biopsy samples from each area were obtained from the lesions. The histopathological and the radiological data derived with the stereotactic biopsy procedure was classified. In particular, the distribution of the histopathological data on radiological localizations was presented with tables.

Results: According to the histopathological results, the most common lesion was glial tumor with a rate of 56.6%. While 21% of glial tumors were low grade (Grade 1,2), 79% were high grade (Grade 3,4). In terms of localization, glial tumor was the most

common lesion in all regions, except for the multifocal lesions. Contrary to the common knowledge, lymphoma was found to be the most common lesion among multifocal lesions. The success of obtaining positive stereotactic biopsy samples in the current series was 95.2% and the complication rate was 3.6%.

Conclusion: Had a routine CT scan been performed on each patient in this series, the number of clinically insignificant small intracerebral hematomas would have probably been higher. Nevertheless, the accuracy of the stereotactic biopsy sampling in terms and the complication rate were similar to those reported in the relevant literature.

Keywords: Stereotactic biopsy, Brain lesion, Radiology, Histopathology, Complication

EP-0979 [Miscellaneous » Education]

The Impact of Microsurgical Laboratories in the Training of Young Neurosurgeons

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Background: At the present time it is necessary to create microsurgical laboratories to improve the level of skills of young neurosurgeons. This allows getting deep knowledge of microanatomy, to improve microsurgical skills and to learn how to perform complex approaches.

Method: The Novosibirsk Federal Center of Neurosurgery began its work in September 2012. The first microsurgical laboratory at 10 working places was established in November 2014. In this laboratory the artificial materials (artificial models of the skull base, vessels) and laboratory animals (for training in microvascular anastomosis) are mainly used. Since June 2016 the second laboratory at 20 working places has been opened mainly for working in cadavers. Each work station is equipped with a laboratory microscope (Carl Zeiss, Meiji Techno), motor system (Stryker), endoscopes (Karl Storz), microsurgical and endoscopic instruments.

Results: Since the opening of the laboratories in our hospital 9 different courses were conducted. Among them – 5 drilling courses (3 Skull base and 2 spinal), 2 courses on microvascular anastomosis, 1 course on endoscopic transnasal technique, 1 course on white matter dissection. During the training much attention is paid to the developing of practical skills of neurosurgeons for working with the microscope, high speed drills, as well as the study of microneuroanatomy.

Conclusion: The opening of microsurgical laboratories is very important and it is improving the system of training of young neurosurgeons. In addition, the work at these laboratories is necessary also for experienced neurosurgeons who work in a modern neurosurgical centers.

Keywords: Microsurgery, Laboratory, Training

EP-0980 [Miscellaneous » Education]**Concept of the Microsurgical Lab Training for Neurosurgical Residents in the Environment with Limited Resources**

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Background: Microsurgery is an integral part of modern neurosurgery. Mastering essential microsurgical skills during neurosurgical training is difficult in low-income countries due to legal and financial constraints. Our aim is to present a training curriculum in basic lab microsurgery for neurosurgical residents.

Method: The first in Ukraine microneurosurgical lab was set up in 2016 at the Romodanov Neurosurgery Institute, designed for 4 working places, equipped with old microscopes and used neurosurgical instruments. All procedures on live animals were approved by the local bioethical committee. As a pilot project, a special curriculum was added to the neurosurgery residency program. It consisted of two 3-hours training sessions a week for 4 months, mentored by experienced staff neurosurgeons and supported by veterinary specialists. In a step-wise approach trainees were exposed first to basic microsurgical procedures on non-live and artificial models (latex gloves, artificial vessels, pepper, chicken legs) and further to more complicated tasks on fresh tissue and live animals (rats, rabbits) with special emphasis on developing deep microsurgical skills (e.g. on rats placed in human skull models).

Results: 12 young residents underwent training in the lab. Overall satisfaction rate was 100%. The translational utility of microsurgical lab training and increased confidence in performing procedures under the surgical microscope in the real setting was assessed by residents as 87±2.3%.

Conclusion: Microsurgical training in the dedicated lab may increase confidence and safety of neurosurgical procedures performed by residents in the operating room and should be recommended for residency programs even in countries with limited resources.

Keywords: Microsurgical skills, Neurosurgery residency, Live animals, Training lab

EP-0981 [Miscellaneous » Education]**Chronic Subdural Hematoma Treatment and Outcomes: A Prospective Study in Harare, Zimbabwe**

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Aim: To describe the demographic characteristics of patients admitted with Chronic Subdural Hematoma, clinical presentation of patients with Chronic Subdural Hematoma and treatment and outcomes in patients with Chronic Subdural Hematoma.

Method: A prospective cohort study was conducted on patients diagnosed with Chronic Subdural Hematoma, presenting to Parirenyatwa Hospital in 2014. A follow up was made up to a month post-treatment. Results were analyzed using SAPs and verified by a statistician.

Results: The male to female ratio was 3:1 and mean was 56 years with a standard deviation of 18. The commonest risk factor was alcohol. History of motor vehicle crashes was significant in age groups younger than 50 years. The commonest presentation was headache at 87.8% and mental changes 77.6%. All the patients underwent burr hole craniostomy. The percentage of patients with one burr hole was 79.3% and with two burr holes was 20.7%. Mortality rate was 3.4%, and our recurrence rate was 5.17%. The overall outcome was good based on a Glasgow Outcome Score (GOS) of 5 which was 88%, and it was influenced by peri operative LOC.

Conclusion: Chronic subdural hematomas are mainly found in the young male population. Clinical presentations are variable, and the outcome with burr hole is good, though outcome is affected by presenting level of conscious. With the introduction of CT SCAN and improved care, this has greatly improved the outcome of this condition. Further studies to look at risk factors to elucidate causes of recurrence will be needed.

Keywords: Chronic subdural hematoma, Burr hole, Clinical, Outcomes

EP-0982 [Miscellaneous » Education]**Bibliometric Analysis of Neurosurgical Publications from Pakistan: A 6-Year Follow-Up Study**

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Aim: To analyze the neurosurgical research output of Pakistan and compare it with that of developed countries.

Method: We conducted a bibliometric analysis of publicly available databases for all neurosurgical publications from Pakistan. All indexed peer-reviewed publications from Jan 2009 - December 2014 where at least one author was affiliated with any neurosurgical departments in Pakistan and research was conducted in Pakistan were selected. Manual and electronic search was done using MeSH terms to search for articles from Pakistan. Articles were then categorized according to design, subspecialty, region and year.

Results: Our search identified 121 articles during the defined study period (mean = 20.16±5.2 papers/year). A relatively constant increase was noticed for the last six years i.e. 2009-2014. From the total 121 references, 100 (82.4%) publications were from one city and upon sub-analysis 80 (66.1%) were from a single institution. Three primary authors cumulatively contributed to 76 (62.8%) of these publications. Almost two-thirds (n= 76, 62.8%) of these publications were published in either regional or international journals while only 37.2% (n=45) were published in local non-neurosurgery specific journals. Only one study in the 6 year study period with level I evidence (meta-analysis).

Conclusion: Neurosurgery research in Pakistan has shown modest improvement in terms of quality and quantity. Collaboration between various centers and channelizing different resources to create national data registries along with basic science labs is much needed.

Keywords: Neurosurgery research, Bibliometric analysis, Pakistan

EP-0983 [Miscellaneous » Education]

Features of Epileptic Seizures in Children Near the Aral Sea Region

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Aim: To study the structures of epileptic seizures, etiologic, clinical and Para clinical parameters in children living in unfavourable conditions in the territory of the Aral sea.

Method: We studied 70 patients with ages 1 to 14 years, treated at neurology department at the Children's Multifield Medical Center of Khorezm region (Uzbekistan) in 2011-2012. 41 (59%) of the patients were boys and 29 (41%) were girls.

Results: Analyzing the nature of seizures showed that 65 (93%) had diffuse and 5 (7%) had focal fallings. In 3 patients with focal seizures observed secondary generality. During analyzing large seizure types, revealed that 81% mostly in the form of tonic and 19% as tonic seizures. Also it became clear that in 80% of patients the duration of the seizure lasts 2-5 minutes. In addition, 67% of patients seizures observed rarely in the remaining 33% of seizures recur one after another. In the study of the effectiveness of treatments carried out in patients, it was found that 45% of them took valproic acid, 30% carbamazepine, 22% benzonala and 3% phenobarbital. It should be emphasized that 12% of patients received a combination of two types of anticonvulsants. As a result of therapeutic interventions was achieved cessation of seizures in 46% and slowing of seizures in 54% of patients.

Conclusion: Study shows that seizures of children mostly symptomatic nature, and their underlying causes are various traumatic injuries received in the pre- and prenatal period.

Keywords: Aral sea, Seizures in children, Epilepsy in unfavourable conditions

EP-0984 [Miscellaneous » Education]

A Teaching Technique for Accurate Placement of the Initial Retrosigmoid Burr Hole Using Preoperative 3D Reconstruction

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Background: The retrosigmoid approach is one the most common approaches in neurosurgery. In some cases, young neurosurgery residents may have difficulty in accurately placing the initial burr hole at the inferior aspect of the transverse sigmoid sinus junction. Placement of the burr hole too far from the sinus can lead to unnecessary bone removal and placement on top of the sinus can increase the risk of sinusal injury. Precise preoperative planning and 3D reconstruction can serve as a valuable teaching aid for

demonstrating correct placement of the initial burr hole and can help facilitate a safe and accurate approach.

Method: Seven cadaveric specimens (14 sides) underwent computed tomography and subsequent 3D reconstruction. The surface location of the transverse sigmoid sinus junction and the proximal segment of the sigmoid sinus were identified using the reconstruction and the distances from this ideal entry point to the asterion, mastoid process, and root of the zygoma. The retrosigmoid craniotomy was then fashioned on each side, the burr hole was placed at the identified point based on the measured distances, the anterior edge of the craniotomy was fashioned based on the 3D reconstruction as close as possible to the sigmoid sinus, and target accuracy was assessed.

Results: All burr holes and craniotomies were successfully placed as confirmed by microscopic inspection. The average time for reconstruction was 12 minutes.

Conclusion: Preoperative 3D CT reconstruction and measurement is useful technique for teaching young residents how to accurately identify the location of the initial retrosigmoid burr hole.

Keywords: Retrosigmoid, Teaching, CT, 3D

EP-0985 [Miscellaneous » Education]

Ultrasound-Guided Lumbar Injection

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The C-arm guide injection is often used because it is difficult to use the blind injection method for the medial bundle branch block and the facet block for spinal injection therapy. Many side effects have been reported due to many radiation exposures. In order to solve these side effects, various methods are being considered and ultrasound guide injection is now being used. We describe the methods of ultrasound guide lumbar injection.

Keywords: Ultrasound, Lumbar spine, Medial bundle branch block, Facet block

EP-0986 [Miscellaneous » Education]

Dry Tap During Ventriculostomy- Lesson Learnt

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Pneumocephalus following ventriculoperitoneal (VP) shunt insertion is an exceptionally rare occurrence. We report such an event after attempting ventricular puncture (ventriculostomy) for VP shunt insertion and then discuss the management of the same. Dry tap can lead to multiple attempts for ventriculostomy with the associated added risks of complications, as well as complicating the subsequent management. In addition, there is an increased risk of tension pneumocephalus, seizure and shunt failure due to a blockage by air bubbles. Our patient presented with features of raised intracranial pressure two months following craniotomy and evacuation of traumatic subdural hematoma. External ventricular puncture revealed egress of CSF under pressure. Upon attempting VP shunting for post-traumatic hydrocephalus, we experienced dry tap during ventricular puncture that complicated further

management. We placed the proximal shunt in the presumed location of the foramen of Monro of ipsilateral frontal horn of lateral ventricle and did not remove the external ventricular drain. Post-operative CT scan revealed pneumoventriculi as the cause for the dry tap during ventricular puncture. Patient was managed with 100% oxygen. He showed gradual improvement and was later discharged. This case shows that variations in the procedure, including head down positioning, adequate cruciate dural incision prior to cortex puncture, and avoiding excessive egress of CSF can help to prevent such complications.

Keywords: Dry tap, Ventriculostomy, Pneumocephalus

EP-0987 [Miscellaneous » Education]

Neurosurgical Education in Jordan, Past, Present and Challenges

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The history of neurosurgery in Jordan is relatively recent; the first neurosurgical service was established in 1961 and the first neurosurgery residency training program was established in 1986.

Admission System: The admission system is heterogeneous and is administered through the institutions' admission committees using their own criteria. All candidates must have a postgraduate internship of at least 1 year.

Training: The training program in neurosurgery is carried out under the regulations of each individual institution. After finishing the 2nd year of training, all trainees must pass the 1st part examination of the Jordan Medical Board in Neurosurgery. This written examination covers basic neuroscience. After 6 years of training, residents become Jordanian Board-eligible and must sit for the Jordanian Council examination in Neurosurgery. After passing this examination, which is a comprehensive examination with written, clinical and oral components, the trainees are granted the Jordanian Board of Neurosurgery certificate.

Current Situation: There are currently 99 qualified Jordanian neurosurgeons. Of those, 71 (72%) work in Jordan while 28 (28%) work abroad. there is one neurosurgeon per 149,253 inhabitants of Jordan. 30 neurosurgeons (42%) are above the age of 60 years, 61(86%) work in Amman and 11% in the country's north.

Challenges: Challenges include the increased national demand for neurosurgical care, maldistribution of neurosurgeons, and demand of neurosurgical training by Jordanians and non-Jordanians, absence of a standardized nation-wide admission system for the neurosurgery training programs with lack of national quality assurance programs for the available local training programs.

Keywords: Neurosurgical education, Neurosurgery, Jordan, Challenges

EP-0988 [Miscellaneous » Education]

Neurosurgeon as Educator: A Review of Principles of Adult Education and Assessment Applied to Neurosurgery

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Neurosurgeons are increasingly being asked to lead clinical care teams and are responsible for the education and training of those taking care of their patients. However, most neurosurgeons have no formal instruction in adult education and learning assessment. The goal of this paper is to review and highlight key principles of adult learning and assessment that should be woven into in the framework of the neurosurgeon as educator. Specific teaching and assessment techniques for use in the neurosurgical operating room and clinic are discussed. Application of the concepts presented in this review could improve the process of neurosurgical education and learning among our trainees.

Keywords: Education, Assessment, Evaluation, Learning, Teaching, Validity

EP-0989 [Miscellaneous » Education]

The State of Neurosurgical Training in Medical Schools: A Global Perspective

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Background: Neurosurgical emergencies constitute approximately 18% of all hospital admissions in the developed world. Less than 0.3% of the medical school curriculum is reserved for neurosurgical education. The relatively high incidence of morbidity and mortality of neurosurgical disease necessitates a focus on neurosurgery as an essential facet of medical training. The purpose of this study was to prospectively assess the base level of neurosurgical knowledge in interns from multiple countries and determine if any correlation between length of the neurosurgical curriculum and tests scores exist.

Method: A standardized 10-question multiple-choice examination was conducted by interns in several countries. Anatomy, physiology, image interpretation and clinical based scenarios were tested. Examinations were performed in a simulated environment. Interns were classified into groups based on their current hospital, year of graduation, University attended, length of neurosurgical rotations at their institutions and previous neurosurgical experience. A statistical analysis was performed comparing examination scores to curriculum length.

Results: 767 interns from 11 countries and 57 universities participated. The mean length of their neurosurgical curriculum was 2.2 weeks. The mean score achieved was 42%. 325 (42.3%) interns had scores of less than 50% and no intern scored 100%. Statistical analysis indicated that longer neurosurgery curricula were associated with higher test scores ($p < 0.001$).

Conclusion: The performance in a cross-geography standardized test revealed that intern performance correlates with length of neurosurgical training during undergraduate studies. A high percentage (42%) of interns failed the test. Consideration should be given to lengthening the neurosurgical curricula.

Keywords: Neurosurgical curriculum, Intern, Examination

EP-0990 [Miscellaneous » Education]**Road Map for Establishing Neurosurgical Training Program -Sudan Experience**Abubakr Darrag Salim Ahmed*National Center for Neurological Sciences, Sudan*

Neurosurgery is one of the most difficult and sophisticated surgical subspecialties, the demand for neurosurgical services is high all over the world, this demand is more urgent in developing countries due to many causes. Sudan is one of the developing countries, Neurosurgical services in Sudan started in 1971, by one neurosurgeon, till year 2003 (33 years) there were only 6 neurosurgeons in Sudan, and one public and one private neurosurgical departments, the high need for neurosurgical services obligated patients to seek neurosurgical services (even for simple conditions) outside Sudan, the costs for the patients in their health and wealth was very high. After the establishment of local specialization in neurosurgery the number of neurosurgeons jumped to about 42 neurosurgeons in 13 years together with 39 candidates enrolling as residents in different levels of their specialization and the number of the departments raised to more than 6 public departments and more than 8 private departments, the number of the patients travelling outside sudan seeking for neurosurgical services dropped too much and has been only confined to difficult conditions and those who desired not to be treated locally. Establishing national neurosurgical specialization and services will help to widen the scope of neurosurgical services and will save money and health of the patients and help to provide services at earlier time.

Keywords: Road map, Training program, Neurosurgery, Sudan

EP-0991 [Miscellaneous » History]**History of Neurosurgery in Algeria**Benaissa Abdennebi*Department of Neurosurgery, Salim Zemirli Hospital, University of Algiers III, Algiers, Algeria*

It is well known that neurosurgery was for a long time practiced worldwide by general neurosurgeons. Before that, surgical procedures were exceptional realized by physicians. In Algeria, four periods can be considered:

First: Modern medicine: Mohamed Nekkache(1854-1942) and Mohamed Seghir Benlarbey (1850-1939) were the two first algerian physicians. In 1922, about forty professors, doctors and surgeons of the Faculty of Medicine of Algiers established a medical magazine: the Journal of Medicine and Surgery of North Africa which will become in 1927 *Algerie Medicale*.

Secondly: Neurosurgery included in general surgery. A few french surgeons ventured into neurosurgery as part of general surgery. As examples of what they were able to achieve we refer to the papers:

- 1899: Spinal hydatid cyst was published in the journal « *Algérie Médicale* » by Sherb.
- 1928: Brain hydatid cyst par P. Lombard.

Then: Modern neurosurgery. The first department of neurosurgery in North Arica, the “Barbier Hugo center” was set up in Algiers in 1948 by Pierre Goinard (1903-1991).

1954: meeting of the french speaking neurosurgical society took place in Algiers

Finally after the independence: Dr Abada completed his neurosurgery residency in Colmar (France), and went to the United States in 1961. In 1962, he came back to Algiers and began to treat patients with brain injuries and tumors. He is considered as the father of the modern Algerian neurosurgery. Today, around 400 hundreds neurosurgeons and 140 residents work in the public and private practices.

Keywords: Neurosurgery, Algeria, History

EP-0992 [Miscellaneous » History]**Neurosurgery in the Ancient Arabic and Islamic Period**Jalal Najjar*Department of Neurosurgery AL-Ameen Hospital Homs, Syria*

During the Middle Ages, the work of Middle Eastern physicians such as Avicenna, Albucasis, and Rhazes was of paramount importance in guarding the knowledge that had been accumulated throughout history, particularly the contributions of Greek and Roman scholars, and it is well known that the Arabic versions of all of the works by Hippocrates and Galen by Islamic and Arabic scholars are the only copies that have survived until now. In addition to preserving this wealth of knowledge, these Middle Eastern scholars made significant contributions of their own to both medicine and neurosurgery. Many points regarding ancient Arabic and Islamic science need to be discussed and clarified, such as cadaver dissections, anatomic studies, neurosurgical practice and instruments, Arabic translations of Hippocratic and other works, and the influence of the Islamic civilization on Western civilization, especially the Renaissance.

Keywords: Ancient neurosurgery, Arabic, History, Islamic

EP-0993 [Miscellaneous » History]**Historical Aspects of Neurosurgery in Sudan**Mohammed Awad Elzain, Abubakr Darrag Salim, Hussein Sulieman Abusalih*Department of Neurosurgery, National Center for Neurological Sciences, Khartoum, Sudan*

Background: The proper neurosurgical practice started in Sudan by dr. Abusalih since 1971. The diagnostic and operative equipments were less advanced at that time, the diversity of neurosurgical problems managed using those simple investigations and operative instruments had made it difficult to achieve good results. Our aim is to describe the effectiveness of diagnostic and operative methods, the quantity and quality of neurosurgical cases operated at that time and to assess the overall outcome of management.

Method: Retrospective review of the cases records were mainly obtained from dr. Abusalih book *Neurosurgery in Sudan* in the seventies. The neurosurgery consultants who first established neurosurgical services in Sudan have also been reviewed beside personal contacts with some doctors who attended that period.

Results: During the period 1970 to 1980, 2315 neurosurgical cases seen. Of them 88% were traumatic brain injuries, 3.8% brain tumours, 1.5% cerebrovascular malformations starting from large to small, 4.1% spinal cases and 2.6% extra-cranial and cranial masses. Most brain tumour cases improved postoperatively (68.5%). Most

cerebral malformation cases were managed medically. For the spinal tumour cases all benign tumours showed complete recovery while malignant ones showed only partial recovery. The extra-cranial and cranial masses were mainly neoplastic 38.3% and congenital 31.7%. **Conclusion:** Despite the lack of personals and the advanced diagnostic and surgical tools, many neurosurgical problems have been dealt with in different neurosurgical disciplines with a good outcome. The recognition of the first steps in the development of neurosurgery will help in its progress in the future.

Keywords: History of neurosurgery, Plain x-ray, Angiography, Myelography

EP-0994 [Miscellaneous » History]

Sushruta - Grandfather of Neurosurgery

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Sushruta practiced Ayurveda in India in 6th century BC. He made major contributions to surgical sciences and therefore is recognized as “Father of Surgery”. He was also a great teacher and recognized importance of cadaver dissection for surgical training. He also gave clear instructions about cadaver preservations. Unfortunately, very little is known about his contributions to Neurosurgery. Author has recently studied “History of Ayurveda” and found exciting facts about Sushruta’s contributions to Neurosurgery. Author would like to share this knowledge and its relevance to modern day neurosurgery.

Keywords: Sushruta, Ayurveda, Cadaver, Dissection, Neurosurgery, Training

EP-0995 [Miscellaneous » Epidemiology]

Ethnicity, Age, and Sex of Patients Hospitalized with Moyamoya Disease in the United States

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Background: Current literature of Moyamoya disease has only been calculated from a hospital record from Washington State and California from 298 patients with reports of a sex ratio (female/male) of 2.2, two peak age distributions of ages 5-9 and 55-59, and highest prevalence among Asian Americans (.28) (Uchino et al. 2005). Hence, the true proportions are unknown within the US. Our aim is to examine demographics of patients hospitalized with Moyamoya disease in the US.

Method: US Census data was evaluated nationwide, and proportions of different ethnic, age, and sex groups was noted. Healthcare Costs and Utilization Project state inpatient databases from 1997-2013 were queried from all hospital admissions for Moyamoya disease in each state data was available. Nationwide trends in specific ethnic groups, age, and sex were evaluated.

Results: Nationwide in 2013, the ethnic group trend shows the incidence (per 100,000) as (.01) Asian American, (.07) African American, (.85) White, and (.06) Hispanic. 2009-2013 data indicate a right skewed age distribution with one peak at 18-44 as opposed

to prior literature. Data for sex ratio in 2013 of 2.4 indicates similar trend to prior literature.

Conclusion: Our results represent large population-based estimates of Moyamoya incidence in the US with the greatest ethnic group of White, followed by African American, Hispanic, and Asian American. This is contrary to prior literature stating Asians are more prevalent. The results reported of age distribution show a difference with prior literature. The results reported show patterns similar to previous reports of predominance of women.

Keywords: Moyamoya disease, Epidemiology, United States

EP-0996 [Miscellaneous » Epidemiology]

Research Methods in Neurosurgery: Past Problems, Current Challenges & Future Consequences

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Background: Every neurosurgeon ought to apprehend and be acquainted with the basics of research methods and the fundamentals of Evidence Based Neurosurgery (EBN) to enhance the comprehension of the research process and critical appraisal procedures of a scientific write-up. This in turn will ensure the appropriate application of scientific knowledge to patient care.

Method: Based on existing theories and models and our cumulative years of experience and expertise conducting research and promoting EBN, we have detected and published on a number of problems with current methods and herein propose solutions.

Results: 1. We herein present a simple, algorithm of research methods frequently encountered in routine neurosurgical practice and its relation to EBN and patient care. 2. There is confusion in the reporting of case reports and other descriptive studies as regard sample size. We have provided a statistical proof to clarify this confusion. 3. We have emphasized the importance of the “descriptive cohort” design frequently mislabeled for case series in 70% of the publications from the top 20 neurosurgical journals. 4. Based on a 70 years assessment, we have revealed a 40-50% mislabeling for case control studies and propose recommendations. 5. Problems of methods related to other study designs are mentioned.

Conclusion: Mislabeled of study designs impairs the appropriate indexing and sorting of evidence with consequences on the application of research evidence on patient care. Understanding research methods and the critical analysis of published reports is a fundamental skill to enable the incorporation of new clinical knowledge to practice.

Keywords: Epidemiology, Research methods, Evidence-based neurosurgery

EP-0997 [Miscellaneous » Epidemiology]

The Development of Stroke Service and Creation of the Republican Coordination Centre for Stroke Problems in Kazakhstan in 2016

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Stroke takes the leading positions of morbidity, mortality and high

disability in Kazakhstan. Annually in Kazakhstan more than 40 thousand people have stroke. The number of patients receiving a disability pension in the country due to stroke, exceeds 200 thousand people, moreover, more than half of them will not be able to live without assistance. Republican coordination centre for stroke problems (hereinafter-RCCSP) was formed by the Order of the Ministry of Healthcare and Social Development of the Republic of Kazakhstan in 2016 on the basis of JSC "National center for neurosurgery". The aim of RCCSP is coordination for all stroke services of the regions in the country, improvement the quality of care, reduction of mortality and prevention of disability. As a result of the work, which is carried out by RCCSP during 2016, the following data are obtained:

- The number of performed systemic thrombolysis in patients with ischemic stroke in Kazakhstan for 2016 increased by 25% in comparison with 2015;
- The number of performed neurosurgical operations and endovascular manipulations with stroke for 2016 increased by 16.6% in comparison with 2015;
- The hospital mortality from stroke in 2016 was 12.6 and decreased by 3% in comparison with 2015. The most adverse regions are Kostanay 17.3, Karagandy 16.3, Aktobe 14.9 and Akmola 14.7.
- The morbidity from stroke in 2016 amounted 226,9 cases and increased by 2.9% in comparison with 2015. The highest rates noted in the following regions: Pavlodar 313.5, Karagandy 291.8, East-Kazakhstan 282.0, Akmola 262.6.

Keywords: Stroke, Epidemiology, Neurosurgery, Neurology

EP-0998 [Miscellaneous » Infections]

Cerebral Aspergillosis in Immunosuppressive Patients: A Retrospective Analysis of Three Cases

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Cerebral aspergillosis is a rare, highly mortal infection of the central nervous system (CNS). It tends to occur in immunosuppressive patients, the mortality rate varies between 60%-100%. We reported 3 cases who were operated for intracranial aspergillosis and treated with intracavitary amphotericin-B. 21-year-old male patient, allogeneic stem cell transplantation was made because of aplastic anemia and vocal cord paralysis developed after 10 days of this treatment. Brain MRI images of the patient revealed multiple, invasive aspergillosis abscesses. The lesions were surgically removed and amphotericin-b was applied locally to the abscesses. 18-year-old male patient, treated for acute lymphocytic leukemia and subsequently developed febrile neutropenia. Brain MRI was performed because of the development of consciousness blurring during the treatment at the hospital and abscess was observed in the right frontal region. The abscess was excised by surgery and the amphotericin-b was applied locally to the surgical site. 45 year-old woman, underwent chemotherapy after mastectomy and autologous blood stem cell transplantation have been made due to the worsening of the blood parameters. Two months after treatments, ataxia was detected and the cerebellar abscess was seen in the brain MRI. The abscess was excised and

applied amphotericin-b. Histopathologic diagnosis of excision materials were reported as invasive aspergillosis for all cases. The first case died 2 weeks after surgery, the second case died 2,5 years later due to multiple organ failure. The third case is alive and stable after 14 years. In cases with cerebral aspergillosis, surgery must be accompanied by intracavitary amphotericin-b. It contributes to the regression of the abscess. The most important cause of mortality is opportunistic infections and multi-organ failure that develop afterwards.

Keywords: Cerebral aspergillosis, Treatment, Surgery, Intracavitary amphotericin-b

EP-0999 [Miscellaneous » Infections]

Cerebral Cysticercosis Mimicking Malignant Glioma

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Cysticercosis is the most common parasitic disease worldwide, with an estimated prevalence greater than 50 million persons infected. The life cycle of the pork tapeworm, *Taenia solium*, begins at the larval stage in pigs. Human tapeworm infection occurs when *T. solium* cysts are ingested from undercooked pork. The larvae attach to the human gut and grow into adult tapeworms. The adult tapeworm then sheds proglottids into human feces that can contaminate the pig food supply. Eggs ingested by pigs develop into the larval stage, travel through the intestinal wall, enter the bloodstream, lodge in various pig tissues, and develop into cysts. When humans ingest eggs, through fecal-oral transmission, they become dead-end hosts of the larval stage of the parasite and develop cysticercosis similar to pigs. This parasite is a leading cause of seizures and epilepsy in the developing world which is caused by infection with *Taenia solium*. 55-year-old man presented with a 14-day history of left lower limb numbness, unsteadiness of gait. On neurological examination, he had left lower weakness (strength, 4/5), with normal tone and deep-tendon reflexes. The plantar reflexes were normal bilaterally. Brain CT documented the presence of cystic lesions in the right frontal lobe associated with cerebral. The radiological data revealed a solitary lesion highly suggestive of high-grade glioma. He was given a diagnosis of neurocysticercosis and treated with surgical treatment. During surgical procedure were found multiple cysts containing yellowish material compatible with neurocysticercosis. The anatomopathological study confirmed the diagnosis of neurocysticercosis.

Keywords: Glioma, Neurocysticercosis, Differential diagnosis

EP-1000 [Miscellaneous » Infections]**Intracranial Aspergillosis Mimicking a Middle Cranial Fossa Tumor Involving the Cavernous Sinus in an Immunocompetent Patient**

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Aspergillosis is rare in immunocompetent patients. Extension to the cranial base via the sphenoid sinus is exceptional. Authors report a case of middle cranial fossa aspergillosis involving the cavernous sinus and mimicking an extra-axial tumor in an immunocompetent 65 year-old male. The patient had been suffering from left trigeminal neuralgia and a horizontal diplopia since 4 months. Physical examination featured a left complete opthalmoplegia and hyperesthesia of the left maxillary nerve. Radiological examination showed a left temporal extra-axial temporal expanding intracranial lesion, involving the left cavernous sinus with extension to the sphenoidal sinus. A large tumor resection was performed through a left fronto-temporal craniotomy with no postoperative complications. Pathologic examination and specimen culture concluded to an *Aspergillus fumigatus*. Authors discuss the clinical, radiological features and management of such lesion.

Keywords: Aspergillosis, Middle cranial fossa, Cavernous sinus, Sphenoid sinus

EP-1001 [Miscellaneous » Infections]**Abscess Drainage in the Right Temporal Region by Puncture-Aspiration in a Patient with Multiple Brain and Liver Abscesses**

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A 45 year old male patient who has a history of multiple liver cysts resection in November 2016 with streptococcus pyogenes positive cultures and medical management with antibiotics. He begins his current condition presenting headache, fever and outflow of purulent abdomen drainage site, which is why he is brought to this unit for evaluation. During his internment he persists with headache and is associated with disorientation in spite of medical management. On physical examination we found a patient with Glasgow coma scale of 14 points for disorientation. Simple computed tomography showing multiple hypodensities, magnetic resonance imaging of skull simple and contrasted is requested, where multiple lesions are corroborated with enforcement to the administration of contrast in T1. The temporal region lesion measures 3.04x 3.23x3.68 with a volume of approximately 18 ml. Drainage of right temporal abscess is performed by burr hole and aspiration puncture, obtaining 17 ml at the aspiration,

initiates a double antibiotic scheme empirically, cultures reported negative and is handled by steroids in a complementary way. The patient is discharged with clinical and neurological improvement with complementary management for 4 weeks. The presence of multiple brain abscesses requires multidisciplinary treatment, as well as to rule out other immunodeficiencies, since previous treatment with antibiotic regimen was not able to isolate the causative agent of brain abscesses. The presentation of this case is based on the association of multiple hepatic and cerebral abscesses and their integral management by puncture - aspiration through a burr hole to the major lesion.

Keywords: Cerebral abscess, Burr hole, Multiple abscesses

EP-1002 [Miscellaneous » Infections]**Neurosarcoidosis Revealed by Hydrocephalus: A Case Report and Review of Literature**

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Neurosarcoidosis is an uncommon but potentially serious manifestation of sarcoidosis. Its clinical manifestations include cranial neuropathies, meningitis, neuroendocrinological dysfunction, hydrocephalus, seizures, neuropsychiatric symptoms, myelopathy and neuropathies. Diagnostic criteria usually include histologic identification of a non-caseating granuloma, supportive laboratory or imaging tests or both, and a compatible clinical course. Although biopsy of neural tissue is the gold standard for the diagnosis of neurosarcoidosis, this is often not practical and the diagnosis must be inferred through other tests, often coupled with biopsy of extraneural organs. Corticosteroids and other immunosuppressants are frequently used for the treatment. We report a case of hydrocephalus related to neurosarcoidosis in a 45 year-old man and we review the epidemiology, pathogenesis, pathology, clinical features, diagnosis, prognosis and therapy of this pathology.

Keywords: Neurosarcoidosis, Hydrocephalus, Granuloma, Biopsy

EP-1003 [Miscellaneous » Infections]**CNS Fungal Infections in Immuno-Competent Patients; Diagnostic Dilemma and Therapeutic Challenges**

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Background: Fungal infections of the central nervous system (CNS) are rare clinical entities. It presents with different clinical manifestations and causes high morbidity and mortality.

Method: This is a retrospective case series study on patients with CNS fungal infections who were immune-competent in a tertiary care hospital. The study covers a 5 years period 2012-2016. We reviewed clinical presentations, radiological imaging, laboratory diagnosis, treatment, and clinical progress.

Results: We found 4 patients, all male, age range (21-65). Two had

a direct invasion from the nasal sinuses (*Aspergillus* infection) with a very aggressive clinical and radiological behavior. The other two were blood-borne with multiple lesions resembling infective emboli and stroke (Dematiaceous infection). All patients failed to respond to medical and surgical treatment and died within few months from diagnosis.

Conclusion: CNS fungal infections in immuno-competent can present in different syndromes (skull base invasion or vascular) and can be quite challenging to diagnose and to treat. More studies are needed to study the resistance of some fungal pathogens to medical therapy.

Keywords: CNS fungal infection, *Aspergillus*, Skull base

EP-1004 [Miscellaneous » Infections]

Thalamic Tuberculoma

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The authors made a report on 37 years old immuno competent patient transferred from Gambia for a progressive onset of a left hemiplegia in a context of pregnancy. There is a past history of night fever and weight loss. Brain neuro imaging (CT scan and MRI) demonstrated a right contrasted enhancing thalamic lesion. Hypothesis was done between high grade glioma, lymphoma and tuberculoma. Because of non-availability of a stereotactic frame we implemented an anti-tuberculosis treatment. Two months later, there was a dramatic improvement of the deficit. A control CT scan done one year later displayed complete disappearance of the lesion but there is brain atrophy. The patient was bradypsychic and had left elbow and knee ankylosis. This observation gave us the opportunity to update a tuberculoma diagnostic and therapeutic algorithm that we implement on 2003.

Keywords: Tuberculoma, Thalamus, Antituberculosis, Therapeutic test

EP-1005 [Miscellaneous » Infections]

Brain Leishmaniasis: Report of One Case and Review of the Literature

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We report one case of brain leishmaniasis. A 14 years old male who presented with seizures; MRI showed a large two masses one in the right frontoparietal region and the other in left parietal region. Surgical biopsy showed a non-caseating granuloma and biopsy from intranasal lesion showed the macrophages containing multiple *Leishmania amastigotes*.

Keywords: Brain leishmaniasis, Non-caseating granuloma, Sarcoidosis

EP-1006 [Miscellaneous » Infections]

Prevalence of Ventriculoperitoneal (VP) Shunt Infection in Hospital Sultanah Bahiyah (HSBAS), Kedah, Malaysia

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Background: Ventriculoperitoneal (VP) shunt placement is the mainstay of hydrocephalus (HCP) treatment. Malfunction is frequent, and with each revision the cumulative risk of VP shunt infection rises for the patient. Infections are frequent complications of VP shunt placement, and infection rates vary widely from study to study. Our aim is to study the outcome of infection VP shunt in HSBAS from 4th April 2011 till 31st Dec 2015.

Method: This is a retrospective study at Neurosurgery Unit, Hospital Sultanah Bahiyah, Alor Setar, Kedah. The number of cases VP shunt performed by Neurosurgery team, HSBAS since the opening Neurosurgical Unit in 4th April 2011 till 31st Dec 2015. Excluded the cases which the VP shunt done in other Neurosurgical centre.

Results: 30 out of 192 patients, the overall prevalence of infected VP shunt in HSBAS was cases. Which is 15.6%.

Conclusion: It could be concluded that Hospital Sultanah Bahiyah has a VP shunt infections within acceptable range compare to international centres, with an expectedly higher prevalence of Coagulase-negative staphylococci infections. The time interval from shunt placement to infection commonly within 1 month. The mortality rate of infected VP shunt is less than 1%.

Keywords: VP shunt, HSBAS, Infection

EP-1007 [Miscellaneous » Infections]

Intracranial Cryptococcoma: A Case Series of Five Patients

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Aim: To describe the clinical characteristics of patients diagnosed with intracranial cryptococcoma (ICC) in one of the largest series from a single institute.

Method: A systematic retrospective analysis of patients histopathologically and microbiology proven) diagnosed as ICC was done using relevant medical records and follow up details. Clinical details, imaging features and diagnosis and treatment modalities were studied and were correlated with outcomes based on regular follow up.

Results: All our cases were males. 60% were between 3rd to 5th decades of life. Headache & vomiting were present in all cases. Only one of the three supratentorial ICC presented with seizures. 4 out of 5 cases (80%) were immunocompetent. Only one patient among the 5 had immunocompromised state in the form of low cd4 count of 354 cells/ cu mm of blood. 3 out of the 5 lesions were supratentorial in location (60%). 2 were in the frontal region (40%) and 1 was in the parieto-occipital region. 2 were in the posterior fossa (40%). All lesion were peripherally enhancing on CT. 2 patients (40%) had ventriculomegaly. We had a good outcome in 75% (3/4) cases whom we could follow up, the mean follow up period among survivors being 6 years.

Conclusion: ICC is a rare fungal entity which is more common in

immunocompetent males. Most patients present with features of raised Intracranial Pressure. *Cryptococcus gattii* is a rarer species which is seen along with the commoner *C. neoformans*. Early diagnosis and surgical decompression followed by antifungal therapy for at least 6 weeks may reduce morbidity and mortality.

Keywords: Cryptococcoma, Intracranial cryptococcoma, *C. Gatti*, *C. neoformans*

EP-1008 [Miscellaneous » Infections]

Hydatid Disease of the Spine: Study of 23 Cases

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Background: Bone hydatid disease is a rare form of parasitic infection (0.5 -2%), but spinal remains the most common location of about 44% and most serious.

Method: Our work is a descriptive retrospective study about 23 cases at Ibn Rochd University Hospital during the period of 2009-2015.

Results: this disease was interesting mainly young subjects with an average age of 32 years, the installation mode was slow in almost all cases, with the main signs: the back pain in all our patients, the motor deficit in 17 cases including 9 paraplegia, 6 paraparesis and 2 tetraparesis. the sensory deficit was found in 16 cases. All patients underwent spinal MRI, while radiographs and CT were performed in 15 cases. the most common site was the dorsal spine, with two cases of cervical spine. All patients were operated, 18 with posterior approach, and 5 with anterior approach. The evolution was characterized by the recurrence in 5 cases, one case of infection of the wall, and we deplore one death from pulmonary embolism.

Conclusion: Spinal hydatid disease is a very aggressive lesion because of the extension and the frequent recurrence. The diagnosis is often made late even in endemic countries. His prognosis remains pejorative hence the importance of prevention.

Keywords: Hydatid, Disease, Spine, Recurrence

EP-1009 [Miscellaneous » Infections]

Nocardia Cerebellar Abscess in a Patient with Nephrotic Syndrome Steroid Dependent Following Triventricular Hydrocephalus

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Opportunist CNS infections occur in about 5% to 10% of patient with nephrotic syndrome undergoing immunosuppressive therapy, but reports of brain abscesses are very rare. *Nocardia cerebellar* abscesses are scarce intracranial lesions. They account for only 2% of intracranial brain abscesses. Published data about these lesions have taken the form of short reports, small cases series and reviews. In the present study, a case of cerebellar abscesses caused by *Nocardia* in a patient undergoing immunosuppressive therapy for nephrotic syndrome is described. To the best of our knowledge, this is the first

such infection case to be reported in our department. The patient had nephrotic syndrome and received systemic corticosteroid therapy for 3 years. Pathogens isolated pus from our operation were identified as *Nocardia* species. The patient was successfully treated by right frontal ventriculostomy and surgical drainage of the abscesses and by tri-IV therapy vancomycin, metronidazole ceftriazone and oral administration of trimethoprim-sulfamethoxazole.

Keywords: *Nocardia*, Nephrotic syndrome, Hydrocephalus, Immunosuppressive therapy, Frontal ventriculostomy

EP-1010 [Miscellaneous » Infections]

Suture Reaction Mimics Osteomyelitis

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Silk began to be used in the nineteenth century after the increase of infections caused by the use of catgut. It is easier to sterilize and cheaper. Less reacts with tissues and provides strong wound closure. But when used in clean wounds, it can occasionally lead to suppuration and sinus draining. A 4-year-old female patient was admitted to our clinic with complaints of mental retardation and gait disturbance. Brain MRI was performed. Arachnoid cyst in the posterior fossa and cerebellar hypoplasia were found. The patient was operated and silk suture was used while binding bone flap. Gait disorder was regressed after surgery. The patient was admitted again after 1 month with complaints of redness, swelling and discharge at the wound site. Contrasted brain CT was performed and bone erosion was seen at the flap. Antibiotherapy had been started with initial diagnosis of osteomyelitis and reoperation was planned. Abscess formation was not detected after skin incision. Dense granulation tissues were found around silk sutures holding the bone flap. Pathologic bone fragments and silk sutures were excised. Sample was sent for histopathologic and microbiological examination. Osteomyelitis was not detected. It should be kept in mind that oftenly preferred silk which is cheap and provides strong wound healing, may cause a reaction that mimics infection.

Keywords: Silk, Suture, Osteomyelitis

EP-1011 [Miscellaneous » Infections]

Pulmonary Cryptococcosis with Intracranial Secondary Localisations in an Immunocompetent Patient: A Case Report

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Cryptococcosis is an opportunist fungal disease that mostly affects immunodeficient patients. We report this unusual case of cryptococcosis in immunocompetent patient in order to discuss the physiopathology and treatment. We present the case of 46 year-old man, with no past medical history, consulting for headache. Physical examination notified cerebellar syndrome without ICH sign. The CT scan and MRI showed two cerebellar lesions and left frontal lesion

with ring-like enhancement. The pulmonary CT scan showed a hilar mass at the right lung. We performed a stereotactic biopsy with histopathology and culture positive to cryptococcus. He received IV amphotericin B and fluconazole with per os relay. Cryptococcus is an opportunist infection. But immunocompetent patients also can be affected. The inoculum is generally by airways and parasite reaches other organs via vessels. Neurologic manifestations are various and depend on the immune status, importance of inoculum and germ virulence. Meningitis is frequent. However, cryptococcoma is uncommon and is found in immunocompetent patients like for our case. It appears like metastasis at brain RMI. But Biological analysis confirms it: detection of antigens in urines, blood, CSF and positive culture. In our case, histopathological analysis confirmed first and the culture was positive. Treating with amphotericin B and fluconazole permit to avoid complications. The delay of treatment is lethal. Cryptococcoma is a rare form of manifestation in immunocompetent patient. Imagery is helpful but biological investigation makes confirmation. Medical treatment without any delay permits a good recovery.

Keywords: Cryptococcus, Immunocompetent, Secondary localisations

EP-1012 [Miscellaneous » Infections]

Cerebral Tuberculoma. About 7 Cases

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Background: Intracranial tuberculomas represent one of the most severe sites of tuberculosis, associated with high mortality and morbidity. The diagnosis is based on anamnestic, clinical-biological, and radiological arguments.

Method: A retrospective study covering a period of 6 years between June 2012 and January 2017, which concerns 7 patients surgically treated for intracranial tuberculoma in the neurosurgery department of the constantine. The reason for consultation in the majority of patients was intracranial hypertension with neurological deficit.

Results: All patients underwent surgery, with 2 men and 5 women with an average age of 46 years. A confirmed history of tuberculosis was found in 3 patients, 2 of whom were treated for pulmonary tuberculosis and lymph node tuberculosis. An intracranial hypertension was observed in 4 cases, motor deficit in 5 cases, cerebellar syndrome in 2 cases, and convulsive seizures in 2 cases. Associated hydrocephalus was found in a single patient. Tuberculosis isolated from the nervous system is rare, its incidence varies from 0.5-2% of the intracranial processes, it results from a haematogenous diffusion from a primary pulmonary focus. The diagnosis is often difficult because the intracranial tuberculoma it presents itself as a lesion Intracranial expansive, the direct study of which shows a central caseous necrosis. Imaging is extremely sensitive but its specificity for accurate diagnosis is low.

Conclusion: The prognosis of intracranial tuberculoma is related to the speed of diagnosis, quality of surgical excision and anti-bacillary treatment.

Keywords: Tuberculoma, Caseous necrosis, Anti-bacillary treatment, Surgery

EP-1013 [Miscellaneous » Infections]

Presentation of Potts Puffy Tumor at a Tertiary Hospital, Parirenyatwa Group of Hospitals in Zimbabwe: A 3 Year Review (2014-2016)

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Pott's Puffy Tumour (PPT) is a rare disease and in English literature only a few cases have been described. This entity was first described in 1760 by Sir Percivall Pott, an English surgeon and is synonymous with the notion of frontal bone osteomyelitis. Aetiology is determined mostly by head trauma but also by complication of acute and chronic frontal sinusitis, which can associate with intracranial complications such as epidural purulent abscess, subdural empyema, intra-parenchymal brain abscesses, meningitis, seizures and cortical vein thrombosis, present in 60–85% of PPT patients. The incidence was higher in the pre-antibiotic era than in the current era of antibiotics. In the post-antibiotic era few cases have been reported thus far, mostly in adolescents and an even smaller number being reported in the paediatric and adult populations as evidenced in the English literature. The first and only case to be published in Zimbabwe was by LF Levy, TK Lambart and MF Gova in 1996 titled POTTS PUFFY TUMOUR in the Oxford journal of surgery. In our region, (Africa), a 15 year review was done at Wentworth Hospital, Durban, KwaZulu-Natal South Africa (1983-1987) for extra-cranial epidural empyemas (Potts puffy tumor) in which 82 patients were identified. This study was done by Nathoo et al. In the years 2014-2016 we witnessed an unusual spike in the number of cases at our institution. I want to present our findings including the incidence and characteristics of our patients. What could be the factors underlying this unusual surge in the cases recorded?

Keywords: Potts puffy tumour, Sinusitis, Osteomyelitis, Empyemas

EP-1014 [Miscellaneous » Infections]

Orbito-Cerebral Mucormycosis and Intracranial Haemorrhage: A Case for Caution with Steroids in Suspected Giant Cell Arteritis

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Giant cell arteritis (GCA) is the commonest primary medium-to-large vessel vasculitis in an ageing western population. Associated significant morbidity including irreversible visual loss means prompt treatment with glucocorticoids is the mainstay of treatment. The gold standard investigation remains a temporal artery biopsy, however, variable sensitivity and false negative rates for the test complicates interpretation. In an increasingly elderly population, co-existing diseases worsened by long-term immunosuppression including diabetes mellitus present a risk for high dose steroid treatment. Our patient presented with a rare angio-invasive fungal infection caused by the organism *Rhizopus* following high-dose steroid therapy for suspected GCA. We discuss here the likely pathophysiology and recommended treatment options, as well as the key role of a specialist multi-disciplinary team.

Keywords: Orbito-cerebral mucormycosis, Cerebral venous sinus thrombosis, Subarachnoid haemorrhage, Giant cell arteritis, Glucocorticoids

EP-1015 [Miscellaneous » Infections]

Aggressive Surgical Debridement Improves Outcomes from Rhinocerebral Mucormycosis Infections

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Background: Mucormycosis refers to invasive infections caused by the saprophytic fungi of the order *Mucorales*. Rhinocerebral mucormycosis is an aggressive infection associated with immunocompromised patients, specifically those with uncontrolled diabetes mellitus. Patients with solid organ and bone marrow transplantation represent a new population of immunosuppressed patients who are at risk for intracranial mucormycosis. The historical mortality with this infection exceeds 70 percent and approaches 100 percent in some series. We have reviewed our recent experience with aggressive surgical debridement to see if outcomes are improved in these patients.

Method: We reviewed all mucormycosis patients at a single institution from 2007 - 2016. We reviewed the medical records and imaging studies of patients with intracranial mucormycosis. All surviving patients had at least one year follow-up.

Results: There were 24 cases identified in this population. Twelve (50%) had iatrogenic immunosuppression, 8 (33%) had diabetes, and 4 (17%) had no recognized risk factors for immunocompromise. All patients were treated with antifungal agents. The majority of patients underwent brain debridement. Nearly all underwent sinonasal debridement. At one year, the number of survivors included 7 of 12 (75%) patients with iatrogenic immunosuppression, 3 of 8 (38%) in those with diabetes, and 2 of 4 (50) in those with no obvious mechanism.

Conclusion: Improved survival from intracranial mucormycosis can be achieved with multimodal therapy. Neurosurgical intervention was once considered to be futile but played an important role in this series. The outcomes in patients with iatrogenic immunosuppression seem to be better than in other subgroups.

Keywords: Intracranial infection, Mucormycosis, Immunosuppression

EP-1016 [Miscellaneous » Infections]

A Case of Constantly Recurring Brain Abscess due to *Cladophialophora Bantiana*

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Brain abscess caused by *Cladophialophora bantiana* is a rare and high mortality disease. *Cladophialophora bantiana* is best known as an agent causing cerebral phaeohyphomycosis in immunocompetent humans. A 30-year-old male was admitted due to a severe headache and dizziness. In Brain MRI, multiple cerebellar masses and massive edema were detected. After the first operation, the pathologic findings were chronic granulomatous inflammation with spores

of fungus consistent with fungal granulomatous inflammation. He was transferred to the division of infectious disease and Amphotericin B injection and then Fluconazole PO medication was done. About 6 months after the first operation, the recurrence was confirmed. After the second operation, the culture result was suspected *Cladophialophora bantiana* and it was confirmed by DNA sequencing 2 months later. After the second operation, he was treated with Amphotericin-B liposomal injection and Fluconazole then Itraconazole PO medication. Six months after the second operation, small recurrence was detected. He was treated with Amphotericin-B liposomal injection and Voriconazole injection. Despite of the aggressive management, cerebellar masses was enlarged in 37 days follow up. So we did another surgery. Gross total tumor and cerebellar dura mater removal were done. After post-OP 9 months there was no recurrence with Posaconazole 400mg bid medication. The mortality rate of *Cladophialophora bantiana* brain abscess approach 100% without treatment, and are approximately 50% even with surgery and antifungal therapy. There is no standard therapy. So far only one treatment method you can expect good result is a complete early excision with using the effective antifungal drug.

Keywords: *Cladophialophora bantiana*, Brain abscess, Recurring

EP-1017 [Miscellaneous » Infections]

Cervical Tuberculous Abscess Mimicking Schwannoma

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Extrapulmonary tuberculosis (TB) is an uncommon condition. Ten percent of extrapulmonary tuberculosis cases involve bone and joints and often appear in the spine. Spinal TB cases often present to the hospital with pain complaints. Rarely, neurological symptoms may be seen. We will present a case of TB abscess, radiologically resembling schwannoma. A 73-year-old female patient presented to the hospital with neck pain, back pain, and left arm pain. The patient had these complaints for 3 months. She went to another hospital and received medical treatment. She applied to our department with ataxic gait and urinary incontinence which were recently developed. Paresthesia and paresthesia were detected in the left upper limb in the examination. An enhanced mass was detected in cervical MRI and it was surrounding the left spinal nerve at C6-7 level, there was necrosis at its central region, and it was primarily considered as a schwannoma. Similar findings were also found in the cervical CT. The latency of both tibial responses was long in the somatosensory evoked potentials test. The patient was operated and the cervical mass was excised. Histological and microbiological examinations were reported as tuberculosis abscess. The patient underwent antibiotic treatment after surgery. Spinal tuberculosis is not rare. However, it can be mixed radiologically with mass lesions. Spinal TB is not the first preliminary diagnosis when there is a spinal mass lesion on MRI, but we should be more careful in radiologically atypical cases, and microbiologic examination should be performed postoperatively.

Keywords: Tuberculosis, Abscess, Spine, Cervical

EP-1018 [Miscellaneous » Infections]**Sudden Tetraplegia Revealing Cervical Intra Medullary Spinal Cord Abscess**

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Primitive Intramedullary spinal cord abscess is a rare disease. We report the case of a 16 years old male with cervical intra medullary spinal cord (IMSC) abscess revealed by brutal tetraplegia and respiratory disorder. The MRI did not bring back the diagnosis also the microbiological agent was not identified after culture. The abscess was drained by myelotomy and large spectrum antibiotic therapy was instated for 6 weeks. The respiratory disorders have disappeared in immediate outcome. The follow up was favorable and the MRI control is clean but unfortunately there is not a significant improvement of the neurological deficit. This case allows us to discuss clinical, radiological and therapeutic features of the eventuality of an IMSC abscess without infectious or immune deficiency context.

Keywords: Tetraplegia, MRI, IMSC Abscess

EP-1019 [Miscellaneous » Infections]**Acute Obstructive Hydrocephalus Secondary to Cysticercosis of the Fourth Ventricle: Neuroendoscopic Treatment**

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Cysticercosis is the most important of the parasitic diseases of the central nervous system due to its high incidence, worldwide distribution, and variety of clinical presentation. Neurocystercosis is a cause of seizure and more rarely, acute hydrocephalus. The fourth ventricle is the most frequent site of intraventricular infestation, a location that carries a higher risk of CSF blockage and resultant intracranial hypertension. Male 35 years-old patient, sudden loss of wakefulness and unspecified epileptic seizures, advanced management of the airway by Glasgow of 7 pts, to our gold intubated RASS -5 assessment, eye fundus with venous beat loss, partially erased papillary borders, 3 mm isometric pupils with hyporeactivity. Simple skull tomography with tetraventricular obstructive hydrocephaly, rounded image with hypodense center in the fourth ventricle. Due to the acute clinical picture of the patient, clinical data of endocranial hypertension and a conclusive image of hydrocephalus, the patient urgently needs to undergo neuroendoscopic exploration, with cysticercus being present in the fourth ventricle, being extracted in its entirety, ventriculoperitoneal shunt is placed posteriorly and cesticidal and steroid treatment is established. The patient is removed 3 days later to his home without neurological focal points. The treatment of choice of cysticercosis of the fourth ventricle is the neuroendoscopic, sometimes the extraction of the ventricular cysticercus fails in the control of hydrocephalus associated with arachnoiditis of basal cisterns and / or ependymitis, whereby the ventriculoperitoneal shunt solves 50-95% of the cases

Keywords: Hydrocephalus, Cysticercus, Fourth ventricle, Neuroendoscopy, RASS.

EP-1020 [Miscellaneous » Infections]**Acute Subdural Empyema from a Lung Primary: A Case Report and Review of the Literature**

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Subdural empyema is a suppurative infection that forms in the subdural space, most often, it occurs as a direct extension of local infection especially from paranasal sinusitis, otitis, direct trauma. Subdural empyema is said to be rare following septicemia and there is no report of an acute subdural empyema following suppurative pulmonary infection in an acute setting. We report the case of a 37 year old HIV negative male patient who presented with a five day history of not communicating. Physical examination demonstrated a hyperpyrexial (T0 380c), in respiratory distress (RR 34, SpO2 70%) grade 2 clubbing, diffuse crepitation in both lung fields. GCS (E1V2M2) of 5/15, anisocoria (left dilated pupil with sluggish reaction to light) as well as paucity of movement to the right side of the body. CT scan showed a left parietal subdural empyema and CXR reveals a left sided chest opacity. ESR of 300 and Gene Expert (TB) test was negative. Patient was taken to theatre and 75 mls of purulent material was drained. Patient was subsequently put on antibiotics and recovered well enough to be discharged from hospital. This case underpins the importance of thorough physical examination in managing patients and the importance of hematogenous spread of infection to the central nervous system.

Keywords: Acute subdural empyema, Haematogenous spread, Chest infection, Case report

EP-1022 [Miscellaneous » Infections]**Cerebral Hydatid Cyst: Same Disease, 2 Patients, 2 Different Results**

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Cystic hydatid disease (caused by *Echinococcus granulosus*) is one of the main forms of echinococcosis, caused by encysted larvae of the dog tapeworm in endemic areas. Cysts grow in the liver, lung, CNS and heart. CNS involvement occurs in approximately 1-3%. Cystic hydatid disease results in seizures, focal neurological deficits, intracranial hypertension. Primary cysts are mostly solitary, secondary cysts are mostly multiple. Cyst density in CT is similar to CSF, around the cyst surrounding edema can be observed. Surgical and medical treatment must be combine for the patients.

Case 1: 10 y.o, Syrian boy referred to our clinic complaint of vomiting, weakness. Patient's GCS was 15 and he had no neurological deficit. He was operated for cerebral cystic hydatid 4 years ago in another city. There was no another organ involvement. In CT and MRI, multiple cystic lesions observed in brain. Medical treatment preferred for this patient.

Case 2: 4.5 y.o., Syrian girl referred to our clinic complaint of headache and lameness. Patient's GCS was 15 and she had mildly paresis at her left leg. There was no another organ involvement. In

CT there was solitary cyst which has approximately 6.5 cm diameter at right parietal lobe. Surgical treatment (craniotomy + Dowling's technique, there was no complications in operation, intact cyst removed from brain) and medical antiparasitic treatment preferred for this patient.

All the neurosurgeons who want to operate cyst hydatid must be careful for intact removal of cyst and don't forget the results of damaged cyst removal.

Keywords: Cyst hydatid, Dowling's technique, Cerebral cyst, Echinococcosis

EP-1023 [Miscellaneous » Infections]

Surgical Management of Intracranial Hydatid Cyst

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Hydatid cyst is caused by infection by the larvae of *Echinococcus Granulosus* (tape worm). 3 cases were done in Cairo University hospitals between July 2014 and July 2016. Computed tomography (CT) and magnetic resonance imaging (MRI) were done in all cases. CT abdomen and lung were done to exclude other lesions. Surgery was done using Dowling technique in all cases followed by 3 cycles of albendazole. Each cycle was 28 days with 14 days rest in between the cycles the main presenting symptoms and signs are increased intracranial pressure. 2 cases the cysts were located in the front-parietal region and the third in frontal region. Intraoperative rupture occurred in one case Surgical removal is the definitive treatment of hydatid cyst followed by albendazole.

Keywords: Hydatid, Cyst, Dawling technique

EP-1024 [Miscellaneous » Infections]

The Dilemma in Neurocysticercosis

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Neurocysticercosis is endemic in the developing world including Africa due to the poor socioeconomic standards of living. An 18 year old male patient came as a referral from Masvingo hospital with a chronic history of headache, vomiting, seizures, neck stiffness and poor vision. A CT scan of the head was done which confirmed hydrocephalus with underlying evidence of neurocysticercosis. Patient had been on treatment for TB meningitis but had shown no signs of remission. The patient was managed surgically with ventriculoperitoneal shunting after which medical therapy was applied with steroids, albendazole and anti-epileptics. This case represents a combination of extra parenchymal and parenchymal neurocysticercosis. Although extra parenchymal neurocysticercosis may be challenging to diagnose and treat, clinicians should be aware of this condition given the increasing incidence.

Keywords: Neurocysticercosis, Hydrocephalus, Ventriculoperitoneal shunt

EP-1025 [Miscellaneous » Infections]

Multiple Human Small Subcutaneous and Brain-Parenchyma Taenia Solium Cysticerci

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Healthy young adult woman who had a clinical history of having multiple subcutaneous nodules that appeared and disappeared in different areas of the body along 18 months. She attended the National Institute of Neurology and Neurosurgery in Mexico City because one week before she presented two generalized tonic clonic seizures. The physical exam showed several subcutaneous nodules, without skin color changes, located by palpation in the head, anterior thorax, left forearm and abdomen. A CT scan was performed demonstrating a vesicular lesion corresponding to a cysticercus in the upper right side of the brain parenchyma. One of the skin lesions was biopsied to confirm the diagnoses. Albendazole, antiepileptic drugs and steroids were given for 7 days. Seven days after treatment, a biopsy of another subcutaneous nodule was obtained which, in contrast to the previous one, was dense and without clear fluid. Cysticerci disappeared between 1 and 12 months later. Neurocysticercosis (NCC) is the most frequent parasitic disease of the central nervous system (CNS) caused by the larval form of the tapeworm *Taenia solium*. There are two strains of this parasite: the African-American and the Asian; the former being less virulent and thus mainly found in the CNS, the latter is frequently found in muscle and subcutaneous tissue with numerous parasites that can be detected by skin palpation. Cestocidal drugs (albendazole and praziquantel) have been used for over two decades as the treatment of choice, however, surgical interventions can be considered, as NCC diagnoses can be challenging.

Keywords: Neurocysticercosis, Cysticercosis, Subcutaneous cysticerci, *Taenia solium*

EP-1026 [Miscellaneous » Infections]

Brain Abscess Caused by *Nocardia Cyriacigeorgica* in a Patient with Psoriasis under Methylprednisolone Treatment for Two Years: A Case Report and Review of Literature

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Nocardia cyriacigeorgica is a recently characterized species within the genus *Nocardia*. In the present study, we report a brain abscess, following a therapy with immunosuppressive agent (Methylprednisolone) for two years aim to treat Psoriasis. A 78-year-old male was referred to the Emergency Department of Bozyaka Training and Education Hospital in February 2017 with a minimally conscious state started 1 week ago. The patient had a history of Psoriasis in treatment therapy with Methylprednisolone 40 mg/day for two years. In neurologic examination, patient's Glasgow Coma Scale was 10 with a motor weakness (3/5) of the right upper extremity. Laboratory showed the following abnormalities: serum

C-reactive protein 176.9 mg/L (normal values inferior to 5 mg/L). A gadolinium-enhanced magnetic resonance imaging revealed a 12 mm solitary, cystic, peripheral-enhancing mass in the same region with significant vasogenic edema and localized mass effect. The patient underwent a total resection of the capsulated abscess through the left frontal craniotomy with the usage of intraoperative real-time ultrasound. Culture grew a branched gram-positive rod organism, which was further identified as *N. cyriacigeorgica*. The patient is still in the intensive care unit under sensitive antibiotic treatment. In conclusion, although nocardiosis has been considered to be rare, it has been reported recently that the incidence of this infection is increasing. In our case etiological diagnosis was made by culture of capsulated abscess. This case confirms that isolation of *Nocardia* in sputum is associated with a high risk of infection in immunocompromised patients.

Keywords: Cerebral abscess, *Nocardia cyriacigeorgica*, Craniotomy

EP-1027 [Miscellaneous » Infections]

Tuberculosis of the Calvarium with Brain and Multifocal Skeletal Involvement

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Tuberculosis of the bone makes around 1-5% of total tuberculous cases, with tuberculosis of calvarium makes about 1% cases of skeletal tuberculosis. This small fraction of the tuberculous osteomyelitis making it a relatively rare condition. 15 years old girl presented with a swelling over the frontal part of her scalp. The swelling was initially considered a sebaceous cyst and was excised. Wound dehiscence occurred and swab culture revealed staphylococcus aureus. In 3 months, the wound had become a nonhealing ulcer. A biopsy of the ulcer revealed non-caseating granulomas. The biopsy stained negative for fungi and mycobacterium. In five months, the patient developed headache, low-grade fever, 10 kgs weight loss and non-tender swelling of right wrist and ankle. A second ulcer developed on the frontal area, measuring around 2x2 cm. ESR and CRP were highly elevated. CT scan of the brain revealed rarefaction of skull bone, with an irregularly enhancing intraparenchymal cystic lesion surrounded by massive perifocal edema. MRI of the right ankle revealed a lesion consistent with infection. Biopsy was obtained from the right ankle lesion and both ulcers. Histopathology revealed necrotizing granulomas with positive growth of mycobacterium. The patient underwent surgical excision of scalp ulcers, underlying involved bone, dura and intraparenchymal lesion. The patient was started on antituberculosis therapy. We present a rare case of multiple non-caseating granuloma of the calvarium that has a brain extension with involvement of other bones, reviewing the management of skull tuberculosis, in setting of brain extension and multifocal involvement.

Keywords: Tuberculosis, Calvarium, Tuberculous osteomyelitis

EP-1028 [Miscellaneous » Infections]

The Cholesteatoma that Almost Got Away

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Growing cholesteatoma can be destructive to important structures in the temporal bone thus timely diagnosis is paramount. A 17 year old HIV positive male patient with a CD4 Count of 343 presents with a 2 day history of headache and meningism on a background of chronic right sided ear discharge with associated hearing impairment on the affected side. GCS 15/15 with purulent discharge right ear canal and perforation of tympanic membrane. Normal csf results for CRAG and bacterial MCS. Audiometry confirmed a right sided conductive deficit. CT scan showed opacification in the mastoid air cells on the right and a small epidural collection in the posterior fossa. Patient had intravenous antibiotics and had a mastoidectomy and drainage of epidural collection done by a team of ENT and neurosurgeons. Histology confirmed a mass of keratinised squamous cells with a diagnosis of cholesteatoma made with no growth on the epidural collection. This case illustrates the difficulty in making a timely diagnosis of a cholesteatoma in resource limited countries and the result of collective effort among physicians, ENT specialists and neurosurgeons. Management of cholesteatoma is mainly surgical with the Ear Nose and Throat specialist having a pivotal role although neurosurgical input is required for cases of intracranial expansion. Eliminating cholesteatoma is almost always possible surgically. Earlier recognition, timely surgical intervention, and supportive antibiotic therapy have decreased the mortality from intracranial complications of cholesteatoma. These include sigmoid sinus thrombosis, epidural abscess and meningitis. Its unresponsiveness to antimicrobials and clinical picture similar to chronic suppurative otitis media can be misleading.

Keywords: Cholesteatoma, Chronic otitis media, Immunosuppression

EP-1029 [Miscellaneous » Infections]

Differential Diagnosis of Brain Abscess by Imaging Studies. About a Case

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Central nervous system infection presents difficulties for its diagnosis due to its limitation in the use of invasive tests, therefore the imaging studies are crucial for the early diagnosis, since these can progress rapidly and cause irreversible brain damage and death. Its clinical picture is non-specific, and it includes alteration of consciousness, headache, intracranial hypertension, convulsions and focality, which coincides with that of other non-infectious intracranial pathologies. Three pathways of dissemination are known: direct inoculation, extension by continuity from an adjacent infectious site and hematogenous dissemination, and the antecedent of any of these can lead to the diagnosis. Male 40 years old who suddenly present tonicoclonic epileptic seizure generalized with loss of consciousness for 10 minutes with recovery later, and a history of three days fever without response to treatment. September 6, 2016 it is performed a CT scan with findings compatible with high grade glioma vs brain abscess (hypodense mass in the right occipital lobe). Viral panel and tumor markers are performed, both with normal parameters. Magnetic resonance is performed with findings indicating brain abscess. Surgical management is performed with neuroendoscopic

abscess drainage with purulent material of approximately 30 cc with negative cultivation; and right ventricular outflow from the right coronary artery. Cultivation of cerebrospinal fluid sample were negative as well.

Keywords: Brain, Abscess, Diagnosis, Imaging study

EP-1030 [Miscellaneous » Infections]

Rare Case of Intracranial Salmonella Enteritidis Abscess Following Meningioma Resection: Case Report

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Salmonella enteritidis (SE) usually causes gastrointestinal infections by contaminated food products. Extra-intestinal manifestations such as brain abscess are rare in adults. We report the clinical features, treatment outcomes and risk factors predisposed our patient to Salmonella enteritidis brain abscess compared to relevant literature. A 56-year-old-female developed SE intracranial abscess following craniotomy resection for a huge left Parietal meningioma. The patient 5 days postoperatively had headache with fever, rigors and wound discharge in association with meningeal signs. Wound aspiration was pus and cultures revealed gram negative rods (salmonella infection). CT-Brain revealed no intracranial collection. I.V antibiotics according to C/S have been started. The patient condition deteriorated; MRI brain with contrast was done and revealed intracranial left Parietal abscess. Emergent wound washout plus abscess evacuation was planned but the patient and her family refused, then we continued on the conservative management for 8 weeks after which follow up CT-Brain showed complete resolution of the abscess. Ten cases of Salmonella abscess associated with primary brain tumor have been reported in literature, most frequently caused by SE in association with glioblastoma multiforme (GBM), but our case was in association with Meningioma. Predisposing factors reported for intracranial salmonellosis include mainly compromised immunity, and recent travel. In our case the only significance is the pointing history of typhoid fever seven months prior to surgery being considered as a carrier. The other different issue about our case is that it has been treated just medically without surgical intervention.

Keywords: Glioblastoma, Intracranial abscess, Salmonella

EP-1031 [Miscellaneous » Infections]

Myiasis Associated with an Osteosarcoma of the Skull: A Case Report and Review of the Literature

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Human myiasis is an exceedingly rare condition. Poor personal hygiene, diabetes, immunocompromised status, and delay in seeking medical attention aggravate this problem. Cerebral myiasis and myiasis that involves tumors of the skull are extraordinary uncommon with only few cases reported previously. We aimed to present a case of myiasis associated an osteosarcoma of the skull involving cutaneous and tumoral tissues of an underlying head. After a trauma and fast growing fronto-temporal tumor, a 37-year-old man was admitted to emergency room. Examination revealed a massive tumor maggot infestation. There was foul smell emanating from the tumor wound. After a CT Scan and once the patient was medically stabilized and initiates intravenous antibiotics, he was taken to the operating room for washout and resection of the tumor. Maggots were removed by suction, attrition, and gentle contact exposure to a mild bleach solution. Resection of the tumor revealed osteosarcoma. Although actually is very uncommon, myiasis could complicated skull tumors. The treatment of choice for human myiasis in malignant cutaneous wounds comprises surgical debridement and mechanical removal of maggots and, if possible, surgical excision of the lesion.

Keywords: Myiasis, Osteosarcoma, Cerebral myiasis, Skull, Larvae, Head

EP-1032 [Miscellaneous » Infections]

Unusual Cerebral Hydatid Cyst Presentation

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Cerebral hydatid cyst is a very rare disease caused by *Echinococcus granulosus*. The diagnosis is usually easy based on a pathognomonic cerebral CT pattern that shows the cystic lesion. We report the case of unusual presentation of hydatid cyst. A 6 year old child presented with progressive left-side hemiparesis with visual disorder and fever that occurred 24 hours after generalized seizures. Cerebral CT scan revealed a cystic lesion with two surrounding walls that enhance after contrast. This radiological feature is unusual. There was a midline shift due to mass effect. Patient was operated through right frontal craniotomy. There was pus collection around the cyst. The cyst was completely removed with the pericyst that was infected. Microbiologic examination confirmed that the cyst was infected. Patient was treated with antibiotics for 6 weeks and albendazole for 3 months. Hydatid cyst is an endemic disease in Tunisia. Cerebral location is rare. Diagnosis of cerebral hydatid cyst may be difficult if the cyst is infected because radiologic feature will be different. In this case, this lesion may be considered like cerebral abscess.

Keywords: Hydatid cyst, Infection, Diagnosis, Surgery

EP-1033 [Miscellaneous » Infections]

Streptococcus Pseudoporcinus: An Extraordinary Microorganism Isolated From CSF

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Streptococcus pseudoporcinus, new described lesser known microorganism, is a facultative beta-hemolytic Gram positive microorganism which was identified as a separate and independent *Streptococcus* species in several human isolates in 2006. In literature, *Streptococcus pseudoporcinus* was primarily isolated from female genitourinary tract but was also isolated from thumb infection, post hysterectomy wound culture. 45 Years old, white caucasian male Syrian refugee admitted to ER. His orientation and cooperation was poor and G.K.S. was 7. He was operated at unknown date in Syria and has a VP shunt. His shunt was working but CT scans revealed that dilated lateral and 3rd. ventricles and periventricular hypodense appearance. His fever was 38.5 Celsius. Blood, urine, CSF, tracheal aspirant culture specimen sent to laboratory. Contrast enhanced thorax and abdominal CT scans didn't reveal and significant sign. Antibiotherapy was regulated by Clinical Microbiology and Infectious Disease Department. In 5th. admission date after multiple CSD cultures he had still high fever and antibiography changed to ceftazidime. VP shunt externalized and external ventricile drainage system applied. 14th Day of admission he arrested and passed away. In clinical microbiology laboratory the patient's tracheal aspirate cultures yielded *Esherichia coli*, *Acinetobacter baumannii* complex. An additional *Streptococcus pseudoporcinus* was isolated from cerebrospinal fluid. *S. pseudoporcinus* was primarily isolated from the genitourinary tract of women but also associated with blood, placental, and wound infections. This case describes first reported cerebrospinal fluid clinical isolate of *S. pseudoporcinus*.

Keywords: Streptococcus, Pseudoporcinus, Meningitis, CSF

EP-1034 [Miscellaneous » Infections]

Central Nervous System Hydatid Cysts: A Tunisian Experience

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Background: Hydatid cyst (HC) is a parasitic disease caused by *Echinococcus granulosus* whose human is the intermediate host. Central nervous system location has been rarely reported. In this study, we aimed to provide an up to date review of the epidemiology, pathological findings and treatment of hydatid cyst of the central nervous system in a Tunisian population.

Method: Retrospective study of HC diagnosed between January 1990 and January 2017. Clinical data were reviewed for each patient.

Results: We had a total of 70 patients between the ages of 3-68 (average age 23.6), There were no sex predilection with a sex ratio

1:1. The cysts were frequently seen in the brain (n= 61) and in the spine in 9 cases. Clinical presentation was various depending in the site of the cyst. The most frequent symptoms in our patients are signs of chronically increased intracranial pressure, epilepsy and recent appearance of neurological deficit. Histopathological examination confirmed the diagnosis in all of the cases. A primary hepatic HC was found in 65 cases.

Conclusion: HC is still a serious public health problem in our country. Central nervous system hydatid cyst disease presents with different clinical pictures depending on the involvement of cerebral and spinal structures. The majority of cerebral HC cases are in the pediatric age group, and their treatment is mainly surgical. Complications depend on several factors including the location, size, and multiplicity of the cysts, as well as the presence of contamination.

Keywords: Hydatid cyst, Central nervous system, Echinococcus

EP-1035 [Miscellaneous » Infections]

Neuroparasitic Infestations Special Experience on Nematodes

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Globalization has produced an increase in the number of people at risk for contracting parasitic infection. Central nervous system infection by nematodal parasites can be devastating. Early recognition and treatment of infection can significantly decrease morbidity of the parasitic infection, as well as the risk of secondary superinfection. Immunosuppression associated with HIV infection or following transplantation increases susceptibility to central nervous system (CNS) infections. Because of increasing international travel, parasites that were previously limited to tropical regions pose an increasing infectious threat to populations at risk for acquiring opportunistic infection, especially people with HIV infection or individuals who have received a solid organ or bone marrow transplant. Neuroparasitic infestations other than Cestodes, Trematodes, and Protozoans is reviewed in this article. The clinical presentation, diagnosis, and treatment for five of the more common nematodal infections of the nervous system—*Angiostrongylus spp.*, *Baylisascaris procyonis*, *Gnathostoma spinigerum*, *Strongyloides stercoralis*, and *Toxocara spp.*—is presented and reviewed.

Keywords: Parasite, Nervous system, Nematode

EP-1036 [Miscellaneous » Technology and Telemedicine]

From Japanese Samurai Sword Katana to Neurosurgical Microscissors

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Micro-Scissors is most important tool. Recently, the authors developed a brand new microscissors made of titanium and Ni-Cr alloy blade (Charmant co, Ltd. Fukui, Japan). Our town has had a history of making Japanese Samurai Sword Katana for 700 years. The blade material was hard Ni-Cr alloy metal and the body of the

scissors was titanium. The different metals were conjugated by the laser. This novel scissors was very light and cutting feeling was very sharp like a Samurai Katana. This microscissors are only available in Japanese market. We introduced this scissors using the video of neurovascular and brain tumor surgery. In addition, cutting torque and the durability of the blade were evaluated by machine experiment. In brief, the cutting torque of ordinal stainless steel had changed 54 Nmm in ordinal stainless steel and Ni-Cr alloy had done 28 Nmm after 20,000 times open-close durability test in saline. In conclusion, this hybrid metal/titanium scissors is ideal tool for modern neurosurgery.

Keywords: Microscissors, Titanium, Katana, Cutting, Durability

EP-1037 [Miscellaneous » Technology and Telemedicine]

Google Glass® Experience in Neurosurgery Training

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Background: Introduction of surgical microscope and endoscope in neurosurgery, not only increased success rates, but also improved resident training experience by providing the most important educational material: observing the operation site from primary surgeon's point of view. Availability of video recording or live streaming provide valuable resources for residents and trainees. However, some procedures do not require such equipment which prevents recording and digitally preserving of this kind of operations for educational purposes. Here we aimed to test an alternative device for recording.

Method: Google Glass® which is an easily wearable video recording device, was used for recording a case of myelomeningocele in a newborn. A survey was conducted among 10 neurosurgery residents about the quality of the footage acquired with Google Glass®.

Results: Device was comfortable to the surgeon. The total recording time with Google Glass® was 70 minutes and 4 seconds with data size of 2.58 gigabytes. Skin closure at the end could not be recorded due to self-shut-down of the device caused by overheating. Video quality of pre-operative preparations was satisfactory. However, during the surgery, high illumination power of the over-head lights caused decrease in video quality. The video quality was not satisfactory to eight residents (80%) whereas 2 residents (20%) stated it was satisfactory.

Conclusion: Although most of the procedures in neurosurgery are performed with surgical microscopes, we think Google Glass® has a great potential for resident training and telemedicine applications. However, improvements regarding light adjustment for operative conditions, heat management and battery life are required.

Keywords: Google glass, Neurosurgery, Residency, Telemedicine, Training

EP-1038 [Miscellaneous » Technology and Telemedicine]

Medical Engineering and Microneurosurgery: Application and Future

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Robotics and medical engineering can convert traditional surgery into digital and scientific procedures. Here, we describe our work to develop microsurgical robotic systems and apply engineering technology to assess microsurgical skills. With the collaboration of neurosurgeons and an engineering team, we have developed two types of microsurgical robotic systems. The first, the deep surgical systems, enable delicate surgical procedures such as vessel suturing in a deep and narrow space. The second type allows for super-fine surgical procedures such as anastomosing 0.3-mm vessels. Both systems are constructed with master and slave manipulator robots connected to local area networks. Robotic systems allowed for secure and accurate procedures in a deep surgical field. In cadaveric models, these systems showed a good possibility of being useful in live human surgeries, but mechanical refinements in thickness and durability are necessary for them to be established as clinical systems. The super-fine robotic system made very intricate surgery possible and will be applied in clinical trials. Another trial included the digitalization of surgical technique and scientific analysis of surgical skills. Robotic and human hand motions were analyzed in numerical fashion as we tried to define surgical skillfulness in a digital format. Engineered skill assessment is also feasible and should be useful for microsurgical training. Robotics and medical engineering should bring science into the surgical field and training of surgeons. Active collaboration between medical and engineering teams and academic and industry groups is mandatory to establish such medical systems to improve patient care.

Keywords: Microsurgery, Robotics, Training, Engineering, Skill

EP-1039 [Miscellaneous » Technology and Telemedicine]

Bedside Ultrasound as a Simple Non-Invasive Method of Assessing Intracranial Pressure in a Limited Resource Setting

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Increased intracranial pressure is usually measured with invasive methods that are not practical in resource-limited countries. However, bedside ultrasound, a non-invasive method, measures the optic nerve sheath diameter and could be a safe and accurate alternative to measure intracranial pressure, even in children. We report a case of a 15-year old patient who presented with severe headache, projectile vomiting, and neck pain for two months. The bedside ultrasound showed a 10 mm optic nerve sheath diameter and a Computed Tomography scan of her brain revealed obstructive hydrocephalus secondary to a mass in the fourth ventricle. After intervening, we were able to monitor the decrease in her optic nerve sheath diameter with ultrasound. Performing invasive procedures

continues to be a challenge in the resource limited setting. However, bedside ultrasound can be a useful tool in emergency centers for early detection and monitoring of intracranial pressure.

Keywords: Bedside ultrasound, Intracranial pressure, Resource limited setup

EP-1040 [Miscellaneous » Technology and Telemedicine]

Apparent Diffusion Coefficient Assessment in Vestibular Schwannomas Method of Evaluation and Morphological Correlations

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Background: Apparent diffusion coefficient (ADC) is a quantitative parameter of diffusion imaging that has been seen to be helpful in the differentiation of brain tumors. Nevertheless, different studies with ADC technique have used various and not structured methods especially for the choice of region of interest (ROI). We evaluated the methodology of ADC estimation in intracranial tumors using different ROI placement patterns.

Method: Twenty consecutive patients affected by vestibular schwannoma were studied using diffusion imaging. Apparent diffusion coefficient values were obtained using different ROI placement methods: segmentation of the whole tumor volume as ROI (vADC), random choice of 10 different ROIs (pADC) and a single ROI in the internal auditory canal portion (iADC). We calculated and statistically compared ADC values with different ROI placement patterns.

Results: There was no significant difference between mean vADC and mean pADC. There was difference between iADC and vADC resulted significant ($p < 0.01$). The statistical analysis showed a significant difference of the vADC between cystic and microcystic schwannomas ($p = 0.009$) and between cystic and solid ($p = 0.006$).

Conclusion: The ADC calculation is still not standardized. The choice of different ROIs is fundamental in order to obtain comparable data. We verified the applicability and reliability of both volume- and seed-based approaches with the necessity, in this second method, to use a multiple randomized seeds to overcome the variability of tumor internal structure.

Keywords: Diffusion imaging, Vestibular schwannoma, ADC

EP-1041 [Miscellaneous » Technology and Telemedicine]

Low-Dose Head CT for Routine Neurosurgical Follow-Up

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Background: Neurosurgical treatment often involves use of several follow-up head CTs. However, there is a concern that ionizing radiation holds potential risk of developing malignancy. Aim of our study is to present a low-dose sequence for routine neurosurgical follow-up developed in our institution.

Method: We routinely use Siemens Somatom Definition AS 128-slice scanner with built in protocol with care dose 4D. After

modification of scan parameters significant reduction of radiation dose was achieved. Two radiologists, blinded for the radiation dose used, evaluated quality of all the scans performed in our institution during period of one month – 45 routine (rCT) and 32 scans using our modified parameters (mCT).

Results: During one month 45 rCT and 32 mCT were performed and evaluated. In the rCT group mean DLP was 1115.5mGy/cm and mean CTDIVol 65.5mGy (120KV, max 430mAs; rotation time 1s; collimation 0.6mm; slice 5mm). While, it was 190.3mGy/cm and 11.5mGy respectively in the mCT group (100KV, max 170mAs; rotation time 1s; collimation 0.6mm; slice 5mm). Scores for granularity (1-5) were higher in mCT group ($p = 0.003$). Gray/white matter contrast was better in the rCT group, but with no statistical significance ($p = 0.068$). In all scans with mCT dose, information for decision making was obtained – hydrocephalus ($n = 7$), intracerebral hematoma ($n = 4$), epidural hematoma ($n = 1$), subdural hematoma ($n = 1$), and normal CT ($n = 19$).

Conclusion: Low-dose head CT can be acceptable tool in recognizing surgical complications and in decision making for reoperation due to hematoma or hydrocephalus in operated patients with significantly lower radiation dose.

Keywords: Computed tomography, Neurosurgery, Radiation dose

EP-1042 [Miscellaneous » Technology and Telemedicine]

“Fisheye Lens” for Operation Microscope Makes Operative Field Twice Wider

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Documentation in neurosurgery is very important for teaching. Video recording is the easiest and reliable tool. Operating microscope can record operation field. Incision lines of pterional craniotomy or lumbar implantation are generally out of microscope view field. Most operating microscope's working height, at maximally zoomed out and well focused distant is about 450mm, above this height focus will be lost. At that level microscopic view field diameter is about 8.5cm. By adapting/mounting properly cutted optician eyeglasses lens - working height can increase upto 80 cm, and view field diameter of 17cm can be viewed well focused. Most neurosurgical procedures incision lines are less than 17 cm. By this 'Fisheye lens' adaptor neurosurgeons can be show and recorded his work without using extra recording equipment. Optimal size is green anti-reflective coated lens with diopter power of -2.0, which cost is about 3-5\$.

Keywords: Fisheye lens, Operating microscope, Lens adaptor

EP-1043 [Miscellaneous » Technology and Telemedicine]

Stress Level Monitoring of Healthcare Workers in a Complex System (Neurosurgery ICU)

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Background: Healthcare care professionals like doctors & nurses are expected to have the highest level of cognitive interactions in complex environments like Emergency rooms & Intensive care units. Wearable biosensors can measure for various physiological parameters which can then be modelled to assess cognition level. This approach will help to reduce medical error that focuses on the emergence, detection and management of error within a complex cognitive system. Our aim is to develop a wearable biosensor for Healthcare professionals to measure the stress in the Neurosurgery ICU.

Method: In this prospective study, we have measured various physiological parameter of the health care professionals in Neurosurgery ICU at JPNA Trauma Center, AIIMS, New Delhi India with the help of wearable heart rate sensor with facility to detect interbeat interval (IBI). This watch wore by the doctors and nurses during the care of patients in NICU. Physiological parameter changes were recorded and analysed by linear and gaussian kernels.

Results: Total 37 doctors and 52 nurses have enrolled in this study. For doctors 325 hours 50 min (Average hours: 3 hours 50 mins) and nurses 1316 hrs 50 min (average hours: 3 hours 30 mins) data was recorded. Doctors and nurses have visible separation (>80%) between their stressful and no stressful event with the linear kernel and Gaussian kernel. This indicates that these are stressful events for both Doctors and Nurses.

Conclusion: We observed variation in all the parameter (Energy, IBI, Heart rate, and Temp) across the stress or no stress data. We can detect 100% stress level in the hospital set up during the medical procedure at the individual level.

Keywords: Stress, Healthcare worker, Medical error

EP-1044 [Miscellaneous » Technology and Telemedicine]

Use of Water Jet Dissectors in Neurosurgery: Review

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Background: Microsurgical management and dissection technique still carries risk of a variety of potential early and late complications. The water jet devices were implemented in the neurosurgical field for their potential to achieve selective and gentle tissue dissection. Published studies on the use of water Jet dissectors are still limited.

Method: We conducted a review of available literature on the use of water jet dissectors in neurosurgery.

Results: Our review identified the following important technical considerations related to the use of water jet dissectors in neurosurgery: The water jet application optimize preservation of vessels, allow precise dissection, avoiding thermal damage of surrounding tissue caused by coagulation. Various water jet dissection instruments have been demonstrated to be safe in intact removal of intracerebral hydatid cyst, in evacuation of cavernous malformation, in neuroendoscopic surgery, in dissection and removal of intracranial tumors such as glioblastoma, in aneurysmal surgery and subarachnoid clot removal, and in prediction of the tissue breaking strength of the epileptic brain. Water jet dissection has been considerably used in the opening of cerebral fissures in several European centers. Nevertheless, the water jet technique

should be used cautiously since injury to normal neural tissue could occur at the higher jet pressures. There is also a risk of tumor dissemination caused by loose tumor tissue fragments.

Conclusion: When appropriately used, water jet dissectors enable a precise and gentle dissection in neurosurgery. However, they should be used carefully and selectively.

Keywords: Water Jet Dissector, Neurosurgery, Surgical technique

EP-1045 [Miscellaneous » Others]

Intracranial Subacute Subdural Haematoma After Spinal Anaesthesia: Severe Post Dural Puncture Headache as an Early Alarming Symptom: A Case Report

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Although intracranial subdural hematoma is extremely rare but is a well known complication of spinal anaesthesia and few cases have been reported in the literature. In this paper, the authors report a case of subacute subdural hematoma following spinal anaesthesia for an elective caesarean section. Thirty-three years old housewife presented with severe headache for 24 days and right sided weakness 1 day prior to admission to neurosurgery department. All these symptoms developed following an elective caesarean section through spinal anaesthesia to deliver her third. The patient was diagnosed as having left sided subacute subdural hematoma and treated surgically with an excellent outcome. Intracranial subdural hematoma is a very rare complication of spinal anaesthesia and it is a must to consider post dural puncture severe headache as an early alarming symptom. Early diagnosis is the cornerstone for setting the management plan. Whether conservative or surgical treatment is chosen, the patients should be closely monitored and followed to avoid the undesirable sequelae.

Keywords: Headache, Intracranial subdural hematoma, Post-spinal anesthesia complications

EP-1046 [Miscellaneous » Others]

Craniometric Analysis of Skullbase in Chiari Malformation Patients with Magnetic Resonance Imaging

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Background: Basilar invagination (BI), Platibasi, increased tentorium angle and posterior fossa hypoplasia are the anomalies associated with Chiari malformation. When Chiari is symptomatic; tonsillary ectopia appears to be a definitive criterion for diagnosis and treatment, the detection of additional anomaly may alter the surgical outcome. The aim of this study to investigate the relationship between tonsillar ectopia and other anomalies.

Method: We retrospectively reviewed 31 cases which had Chiari Malformation at Katip Celebi University Atatürk Training and Research Hospital. There were 8 men (25.8%) and 23 female (74.2%). A mean age of 37.9 years.

Results: 17 patients (54.8%) had tonsillar ectopia 0-5mm, 14 patients had tonsillar ectopia over 5mm. 7 patients had syrinx (22.6%), 2 patients had mild hydrocephalus (6.5%). 6 patients had surgery for the treatment. The mean length of the clivus was 39.3 mm, supraoksiput length was 40.4 mm, cerebellar hemisphere length was 61.08 mm, Mc Rae line was 33.14 mm, Twinning Line was 79.4mm and Tentorium-Twinning line angle was 40.35 degrees. There was no significant difference between Tonsillar ectopia, syrinx and hydrocephalus. Basilar invagination had relationship between platibasi (6 patients had platibasi according to 2mm criteria, 2 patients had platibasi according to 5mm criteria ($p < 0.05$)). Patients with syrinx had relationship between Chamberlain line ($p < 0.05$).

Conclusion: In our study, although there was no statistically significant difference between the tonsillary ectopia and the criteria of these anomalies, the relationship between basilar invagination and platibasi was significant.

Keywords: Chiari malformation, Craniometric, Magnetic resonance imaging, Tonsillar ectopia

EP-1047 [Miscellaneous » Others]

An Immunohistochemical, Histopathological and Biochemical Analysis of the Neuroprotective Effects of Memantine, and Curcumin After Cerebral Ischemia-Reperfusion Injury in Elderly Rats

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Aim: To investigate the protective effects of curcumin (CUR) and memantine (MEM) on cerebral ischemia/reperfusion (I/R) model in elderly rats.

Method: The experiment was designed in 40 Wistar Hannover rats, randomly allotted into one of five groups (n=8): CUR (Group I), MEM (Group II), CUR+MEM (Group III), ischemia (Group IV), and sham-operated (Group V). Surgically-induced cerebral ischemia was performed by means of bilateral common carotid artery occlusion for 30 minutes, followed by 72 hours reperfusion. Tumor necrosis factor- α (TNF- α), interleukin-6 (IL-6), lactate dehydrogenase (LDH), catalase (CAT), glutathione peroxidase (GSPx), xanthine dehydrogenase (XDH), superoxide dismutase (SOD) and malondialdehyde (MDA) were investigated in the rats' brain tissue and serum. Neuronal loss in the brain tissue samples was detected using the apoptotic index (AI).

Results: Serum and tissue levels of IL-6, TNF- α , MDA and LDH were found significantly lower in the treated groups (Groups I, II, and III) compared to the untreated group (Group IV) ($p < 0.001$). Tissue and serum GSPx, SOD and CAT levels in the treated groups were determined to be significantly higher than those of the untreated group ($p < 0.001$). There was no statistically significant difference between the treated and the untreated group in terms of histopathological changes. Statistical difference in terms of AI was not detected between control and treatment group.

Conclusion: CUR, MEM and CUR + MEM were found to be effective in preventing oxidative damage in cerebral ischemia but failed in the prevention of tissue damage.

Keywords: Memantine, Curcumin, Ischemic stroke

EP-1048 [Miscellaneous » Others]

The Effect of Cell Population, Enriched with Determined Precursors of Serotonin Genesis, on the Regeneration of the N. Raphe Zone in Experimental Injury Under Culture Conditions

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Background: The aim was modeling the mechanical trauma of n. raphe zone in vitro to study the reaction of the serotonergic system to traumatic injury and investigate the regenerative effect of the serotonin activated fetal cells.

Method: Long-term tissue culture (7 weeks) of n. raphe zone of newborn rats was used for the experiment. The injury was caused by mechanical intersection of the neuroglial fibers. Traumatic injury led to the occurrence of degenerative changes in the tissue: the disappearance of histochemical reaction to serotonin as well as the expression of main serotonin genesis *Dlx*, *Pet1*, *Nkx2.2*, *Tph1* and *2*, *Sert*.

Results: With further cultivation only the deeper process of degeneration at the morphological and functional levels was noted. The serotonin activated suspension of n. raphe fetal cells was added to the cultures after experimental nerve injury in the parallel series of experiments. This cell population was characterized by a high level of *Nkx2.2* gene expression. In this case the restoration of destructive neuroglial fibers and their germination through the intersecting zone, an appearance of fluorescent serotonin granules in the newly formed sprouts (its total content was increased by 1.4 times according to IFA data), the restoration of expression in whole gene regulation complex of serotonin metabolism, including *Tph* and *Sert* were occurred.

Conclusion: Thus, morphological and functional regeneration involving the whole complex of relevant genes was stimulated by the addition of the serotonin determined population of fetal cells in modeling nerve injuries of general serotonergic pathways under cultural conditions.

Keywords: Serotonin, N. raphe, Injury, Regeneration

EP-1049 [Miscellaneous » Others]

Rare Neurosurgical Cases: Report of Three Cases

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In neurosurgical practice we have found so many cases variations. We operated three most uncommon tumors, one presented in the posterior fossa, another in the upper dorsal spine and rest one was peripheral nerve tumour in the forearm. 12 years old boy was suffering for headache, occasional vomiting, visual disturbances and difficulty in walking and he couldn't see on his left eye. MRI shows large posterior fossa space occupying tumour which operated and per operative finding was ependymoma but histopathology showed different one. Another case 21 years male was suffering from severe weakness of both lower limbs, difficulty in walking and micturitions and diminish sensations from mid chest. MRI shows upper dorsal intramedullary spinal cord tumor, cystic appearance seems to be astrocytoma or ependymoma but per operative finding was epidermoid which was confirmed by histopathology. Upper dorsal intramedullary epidermoid is one of the rare spinal cord space occupying lesion. Third case was 30 years old male was suffering from swelling in the right forearm which rapidly growing and hampered his daily activities. NCV result was impaired functions of ulner nerve and histopathology showed PNET.

Keywords: Posterior fossa, Dorsal epidermoid, PNET

EP-1050 [Miscellaneous » Others]

Endoscopic Bimanual and Sharp Dissection Technique for Total Resection of Colloid Cysts

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Aim: To evaluate the safety and efficacy of an endoscopic bimanual and sharp dissection technique for total resection of colloid cysts.

Method: The endoscopic bimanual and sharp dissection technique was applied in 19 consecutive patients harboring a colloid cyst from 2007 to 2016. There were 11 males and 8 females. The age of the patients ranged from 18 to 75 years (mean age 39 years). All patients presented with symptoms of occlusive hydrocephalus. Steps of surgery were cyst wall incision, cyst evacuation, choroid plexus coagulation and cutting, mobilization of the cyst into the lateral ventricle, coagulation and cutting of the cyst pedicle. The bimanual technique was used to expose the cyst pedicle sufficiently to allow a safe coagulation and cutting. Several times, the endoscopic sheath was used to retract the fornix which enabled a good exposure of the tela choroidea.

Results: The goal of surgery was total cyst resection which was achieved in all procedures. In 3 patients, major venous hemorrhage occurred which was dealt with the dry-field technique. One minor arterial hemorrhage was controlled by bipolar coagulation. Aseptic meningitis was observed in one patient. There was no permanent morbidity or mortality. The average follow-up period was 43 months (range 3-105 months). The symptoms resolved completely

in 17 patients and improved in 2 patients. To date, no recurrence has been observed.

Conclusion: The endoscopic bimanual and sharp dissection technique allows a safe total resection of colloid cysts, even when they are difficult to expose.

Keywords: Colloid cyst, Endoscopic resection, Neuroendoscopy, Navigation

EP-1051 [Miscellaneous » Others]

Effects of Modic Changes in Lumbar Spine on Pain Intensity, Disability and Quality of Life

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Aim: To assess the effects of Modic changes on pain intensity, disability and quality of life.

Method: 121 patients were included. Pain intensity was assessed using The McGill Pain Questionnaire, level of disability was assessed using The Oswestry Disability Index and quality of life was assessed using The SF-36 Health Survey. Modic changes were classified into 'Type0'(no Modic changes), 'Type1'(Type1 and 1/2) and 'Type2'(Type2, 2/3 and 3).

Results: 76(62.8%) patients had Modic changes. Of these 23(30,3%) had 'Type1' and 53(69,7%) had 'Type2'. In The McGill Pain Rating Index, patients with Modic changes had worse score than patients without Modic changes($p=0,006$), there was no significant difference between Type1 and Type2($p>0,05$). Patients with Modic changes had higher level of disability in The Oswestry Disability Index scores, compared to those without Modic changes ($p=0,000$), there was no significant difference between Type1 and Type2 ($p>0,05$). Patients with Modic changes had worse score in The SF-36's dimensions of Physical Functioning ($p=0,000$), Physical Role Functioning($p=0,000$), Bodily Pain($p=0,008$), Emotional Role Functioning ($p=0,023$) and Social Functioning($p=0,002$), compared to those who had no Modic changes. In these dimensions, there was significant difference between Type1 and Type2 ($p>0,05$) except Social Functioning($p=0,030$). Modic changes have a negative effect on pain and level of disability but there is no difference between Type1 and Type2.

Conclusion: Modic changes have a negative effect on quality of life in terms of dimensions of Physical Functioning, Physical Role Functioning, Bodily Pain, Emotional Role Functioning and Social Functioning. But there is no difference between Type1 and Type2 except Social Functioning.

Keywords: Modic changes, Low back pain, Level of disability, Quality of life

EP-1052 [Miscellaneous » Others]**Evaluation of the Anti-Kindling Effect of Allopregnanolone Alone and in Combination with Sodium Valproate in Pentylene-tetrazole Induced Kindling Model in Rats**

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Background: Studies in the animal models of epilepsy have suggested the anti-seizure effects of neuroactive steroids and its derivatives but no such studies have been reported on the role of allopregnanolone in chemical kindling model of epilepsy. The aim of this study was to evaluate the anti-kindling effect of allopregnanolone alone and its interaction with sodium valproate in pentylenetetrazole induced kindling model in rats.

Method: In a PTZ kindled Wistar rat model, sodium valproate and allopregnanolone were administered 30 min before the PTZ injection. The PTZ injection was given on alternate day till the animal became fully kindled or till 10 weeks. The parameters measured were seizure score of kindled rats, histopathological study of hippocampus, hippocampal anti-oxidant parameters and hippocampal DNA fragmentation studies.

Results: The combination of low dose of allopregnanolone with low dose of sodium valproate showed a similar beneficial effect to that of a higher dose of sodium valproate in significantly reducing the number of kindled animals (0/8) as compare to PTZ control group (5/8) as well as the seizure scores and the histopathological scores. The combination significantly decreased the oxidative stress by lowering the malondialdehyde levels and increased the super oxide and reduced glutathione levels in the hippocampus of rats. The data suggest the synergistic interaction between allopregnanolone and sodium valproate as antkindling agents.

Conclusion: The study suggests anti kindling synergism between sodium valproate and allopregnanolone. It helps to reduce the dose of sodium valproate and thereby reduces the incidence of adverse effects.

Keywords: Allopregnanolone, Sodium valproate, Kindling, Synergism

EP-1053 [Miscellaneous » Others]**Hemangioblastoma of the Central Nervous System: Experience of the Pathology Department at Rabta Hospital**

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Hemangioblastoma is a benign vascular tumor of the young adult. It occur mainly in the cerebellum and it can also be seen in the spine. Rarely, it occurs the cerebral hemispheres. This entity may be sporadic or be a manifestation of Von Hippel-Lindau (VHL) disease. The aim of this study is to describe the epidemiologic, the clinical

and the pathological characteristics of the hemangioblastomas of the central nervous system. This is a retrospective study. We reviewed the cases of hemangioblastomas diagnosed at the department of pathology of Rabta Hospital from 1990 to 2014. For each case, we analysed gender, age, tumor localisation and pathological aspect of the lesion. 64 cases of hemangioblastoma has been diagnosed in 24 years from 1990 to 2014. The mean age of patients were 40 years (15 to 80 years). Sex ration was 1.66. 58 tumors were intraparenchymal. In six cases, the tumor was localised in the spine. At histology, all the tumors were highly vascularised. Sinuous capillaries are observed within trabeculea and nests of round to oval cells with eosinophilic cytoplasm. Mitoses were rare. Hemangioblastoma is a benign vascular tumor that can occur as a manifestation of Von Hippel Lindau disease. The treatment is surgical. The prognosis is good and depends of the age, the localisation of the tumor and the number of tumors at diagnosis.

Keywords: Hemangioblastoma, Central nervous system, Histology

EP-1054 [Miscellaneous » Others]**Rivaroxaban Associated Spontaneous Epidural Hematoma**

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Rivaroxaban is a factor Xa inhibitor that is administered orally in the management of atrial fibrillation and abnormal nonvalvular thromboemboli. Rivaroxaban was developed with the goal of predictable pharmacokinetics that eliminates the need for monitoring the international normalized ratio. Several characteristics have made rivaroxaban an attractive alternative to warfarin; once daily dosing, obviate the need for monitoring the international normalized ratio, noninferiority to warfarin in treating atrial fibrillation, and decreased risk of bleeding in comparison to warfarin. 17-year old male, with a previous hospitalization due to Deep Vein Thrombosis (DVT) and medicated with Rivaroxaban and Clopidogrel. Four days later, he was admitted into our emergency service with loss of consciousness after severe headache and there was no reported trauma. He temporarily recovered his consciousness but a few minute later became progressively comatose (lucid interval). Brain CT scan depicted as epidural hematoma on the right with midline deviation. The right parietal craniotomy was performed and the epidural hematoma drained. Rivaroxaban has same effectiveness with vitamin K antagonist in prevent thromboembolism but with the lower side effect in intracranial bleeding. To our knowledge, this is the first report of spontaneous epidural hematoma associated with rivaroxaban usage.

Keywords: Rivaroxaban, Clopidogrel, Spontaneous epidural hematoma

EP-1055 [Miscellaneous » Others]**Neurosurgery Practice in Public Versus Private Sector in Saudi Arabia: An Interesting Statistics**

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Although neurosurgical services in public and private hospitals are more or less the same there is some key point differences between the two. In our brief talk we are going to present statistical facts that will show how private practice have contributed largely and effectively in neurosurgical practice in Saudi Arabia. However as everything in life, neurosurgical practice in private hospitals has its pros and cons both for patients and neurosurgeons which we will also discuss in our presentation.

Keywords: Private practice, Public hospital, Neurosurgery statistics in KSA

EP-1056 [Miscellaneous » Others]

Remote Bleeding After Craniospinal Surgery

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Hematoma in unrelated location following craniospinal surgery is rare. Our experience with three such led us to propose that aside from systemic reasons like hypertension, anticoagulant therapy and hematologic disorders, preexisting, undiagnosed vascular pathologies and great volumes of CSF loss during surgery may cause bleeding in distant anatomic compartments. 45 year old female showed acute severe deterioration following craniotomy for a left temporal arachnoid cyst. CT showed a large right parietal intracerebral hematoma. The hematoma was removed and biopsy was taken from the wall of the hemorrhagic cavity. Pathology was angioma. She was completely well. Six months postoperatively she developed subdural hematoma over the left cerebral cortex. Hematoma was evacuated. 61 year old female was operated for a thoracic meningioma. The lesion was totally removed. The dura was primarily sutured. No CSF leak was observed after dural closure. A hemovac drain was left in the surgical field. The patient developed headache on the second postoperative day. Intracranial air was detected on CT. The hemovac was removed. Intravenous hydration and diazepam was started. The headache increased on the fifth postoperative day. The MRI showed hemorrhage in both cerebellar hemispheres. Conservative treatment was continued. She was completely asymptomatic in three weeks. Control scan showed clearing of blood from cerebellar hemispheres. A suprasellar meningioma was totally removed from a 54 year old lady with uneventful postoperative period. A week after supra and infratentorial subarachnoid hemorrhage, minimal intraventricular blood and left frontotemporal subdural hematoma was observed. The patient responded positively to conservative treatment.

Keywords: Hematoma, Craniotomy, Spine surgery, Intracranial bleeding

EP-1057 [Miscellaneous » Others]

The Timed Up and Go Test a Diagnostic Criterion in Normal Pressure Hydrocephalus

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Background: Normal Pressure Hydrocephalus (NPH) is a disease characterized by gait disturbance, urinary incontinence and

dementia. Our objectives were to define an average value of the test for the population, check the specificity and test sensitivity as evaluation criteria and diagnostic testing and correlate with other already used more frequently.

Method: A study conducted at the Neurosurgery Division of the Hospital do Servidor Público Estadual de São Paulo in which a group of 30 patients with NPH was submitted to the Mini Mental State Test Examination, Time Up and Go (TUG) and Japanese scale for NPH, prior to the Tap Test 3 hours and 72 hours after the Tap Test. After being subjected to Ventriculoperitoneal shunt, patients were evaluated 3 months, 6 months and 12 months after surgery. A control group was used composed of 30 individuals of the same age and who had no diagnosis of NPH, which were submitted to the TUG test for determining an average which was compared to that of patients with NPH.

Results: TUG did not show good correlation with other tests used, but there was excellent specificity (0.967) and sensitivity (0.933) for cutoff value of 16.5 seconds for the diagnosis of NPH.

Conclusion: TUG is a good test for the diagnosis of NPH since there is very good specificity and sensitivity, with a mean value of 16.5 seconds as cutoff.

Keywords: Normal pressure hydrocephalus, Ventriculoperitoneal shunt, Diagnostic, Gait apraxia

EP-1058 [Miscellaneous » Others]

Effect of External Ventricular Drainage on Serum Sodium Levels in Adult Neurosurgical Patients

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Background: Hyponatremia is a common electrolyte abnormality observed in neurosurgical practice. The purpose of this article is to report the preliminary findings on the relationship between hyponatremia and continuous extraventricular drainage in adult neurosurgical patients.

Method: We retrospectively studied the mean serum sodium levels of 67 patients (29 female, 38 male) who were operated for intracranial pathologies and underwent extraventricular drainage insertion to monitor and decrease the intracranial pressure. We correlated serum sodium levels with cerebrospinal fluid (CSF) drainage in three time periods (early, medium and late periods).

Results: The mean duration of CSF drainage was 10 ± 6.4 days. Fifteen patients experienced hyponatremia during CSF drainage. Thirteen of them (86.6%) had borderline hyponatremia. One patient with the diagnosis of pituitary macroadenoma and one with subarachnoid haemorrhage had mean serum sodium level of 129 mmol/L during the medium period. There was no significant correlation between the mean serum sodium levels and the CSF drainage values in any of the periods.

Conclusion: Our findings showed no association between hyponatremia and continuous CSF drainage in adult patients indicating that extraventricular drainage can be used safely except in certain intracranial pathologies which require cautious observation for low sodium levels.

Keywords: External ventricular drainage, Hyponatremia, Adult, Cerebrospinal fluid, Sodium

EP-1059 [Miscellaneous » Others]**Somatosensory Evoked Potentials and Cerebrospinal Fluid Flow in Chiari Malformation**

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Background: Many studies reported that the degree of tonsillar herniation does not correlate with the severity of symptoms in Chiari Malformation Type 1 patients. The aim of this study is to investigate the relationship between tonsillar herniation Cerebrospinal Fluid (CSF) flow and Somatosensory Evoked Potentials (SEP) in Chiari Malformation Type 1 patients.

Method: We retrospectively reviewed 27 patients which had Chiari Malformation at Katip Celebi University Atatürk Training and Research Hospital. There were 7 men (25.3%) and 20 female (74.1%). A mean age of 38 (range 15-62) years.

Results: 14 patients (51.9%) had tonsillar ectopia 0-5mm, 13 patients had tonsillar ectopia over 5mm (48.9%). CSF flow abnormality was found in 13 patients (48.1%) and SEP abnormality in 6 patients (22.2%). All patients Clivus, supraoccipital, cerebellum hemisphere, Mc Rae line, Twinning line lengths and tentorium Twinning angle, Welcher basal angle, Boagard angle were measured. There was no significant difference between tonsillar ectopia degree and abnormal SEP. 6 patients who had abnormal SEP also had CSF flow abnormality ($p < 0.05$). There was a significant difference between SEP and platibasia. ($p < 0,05$). Of the 27 patients, 5 were operated. There was statistically difference between CSF flow, tonsillar ectopia and surgery ($p < 0.05$).

Conclusion: The presence of CSF flow disorder in Chiari symptomatic patients is a finding of a hypoplastic posterior fossa. CSF flow disorder was associated with tonsillar ectopia. Despite the high rate of platybasia in patients with SEP disorder, more studies should be done in the future.

Keywords: Cerebrospinal fluid flow, Chiari malformation, Morphometric, Somatosensory evoked potentials

EP-1060 [Miscellaneous » Others]**Endoscopic Trans-Septal Approach for Colloid Cyst Excision: Surgical Technique and Anatomical Considerations**

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Colloid cysts are usually located at the rostral part of the third ventricle in proximity to the foramina of Monro. For an endoscopic transforaminal approach to be performed, an essential patho-anatomical prerequisite is an open foramen of Monro through which the cyst is visualized and manipulated. Some third ventricular colloid cysts, however, attain large sizes, reach a very high distance above the roof of the third ventricle and occlude foramen of Monro. Such anatomical arrangement renders the endoscopic transforaminal approach impossible. In such anatomical environment, an endoscopic transseptal approach enables excision of these unusual colloid cysts. A description and a technical video

of the endoscopic transseptal approach for colloid cyst excision is presented along with an analysis of the anatomical variations of the structures in the vicinity of the roof of the third ventricle that may explain such a pattern of growth of third ventricular colloid cysts.

Keywords: Endoscopic, Colloid cyst, Transseptal, Third ventricle

EP-1061 [Miscellaneous » Others]**Incidental Finding of a Temporal Arachnoid Cyst in a Patient Presenting with an Ischemic Stroke**

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Intracranial arachnoid cysts are relatively common findings on neuroimaging studies (either incidental or symptomatic). Incidental lesions usually have a benign course and have been managed expectantly. On occasion, some cysts have presented with hemorrhage. We report a case of an incidentally discovered temporal arachnoid cyst in a patient presenting with an ischemic stroke emphasizing on the importance of the clinical symptoms. We hereby present the case of a 50 y.o patient who presented with sudden onset of a left hemiparesis with no impairment of consciousness. The initial computer Tomography (CT) scan, revealed a compressive left temporal arachnoid cyst with bony changes suggesting of a chronic evolution of this cyst. No other lesion was seen; the left cyst didn't explain the left hemiparesis. An MRI was then indicated that revealed very early ischemic changes on Diffusion weighted images (DWI) in right middle cerebral artery territory explaining the symptoms. The patient recovered from the ischemic stroke and the asymptomatic arachnoid cyst was managed conservatively. Intracranial arachnoid cysts are common found lesions on any brain imaging. We hereby insist on the importance of the clinical presentation especially when signs and symptoms do not explain incidentally discovered lesions; And we remind the role of DWI to detect early ischemic changes (acute stroke; early ischemic change; cytotoxic edema).

Keywords: Arachnoid cyst, Ischemic stroke, Diffusion-weighted image

EP-1062 [Miscellaneous » Others]**Folate Cycle Genes Variants and Risk of Early-Onset of Atherothrombotic Ischemic Stroke in Ukrainian Caucasian Population**

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Ischemic stroke is a highly invalidating disease that affects people of different ages. Blood vessels damage and risk of early-onset of atherothrombotic ischemic stroke can be linked with genetic changes in candidate genes such as methylenetetrahydrofolate reductase (MTHFR), methionine synthase (MTRR) and methionine synthase reductase (MTR). 78 cases (24 female and 54 male, mean age was $53,9 \pm 9,43$ years old) and 55 controls (20 female and 35 male, mean

age was $59,8 \pm 14,8$ years old) were enrolled in this study. There was no significant difference for sex, age and smoking attitude among participants. All subjects participating were white north European. Odds ratios (ORs) with 95% confidence intervals (CIs) were applied to assess the association. C677T and A1298C (MTHFR gene), A66G (MTRR gene) and A2756G (MTR gene) polymorphisms were determined by polymerase chain reaction followed by digestion with restriction enzymes and allele specific PCR method. The results had suggested that C677T (MTHFR gene) and A66G (MTRR gene) polymorphisms had an increased risk for atherothrombotic ischemic stroke, reaching significant levels in recessive model (TT vs. CC+CT: OR = 4,816; 95% CI: 1,033-22,415 and GG vs. AA+AG: OR = 2,241; 95% CI: 1,021-4,414 respectively). Decreased risk of atherothrombotic ischemic stroke was observed for minor allele G of A2756G polymorphism (MTR gene) in additive model (A allele vs. G allele: OR = 0,455; 95% CI: 0,250-0,826). No significant association was found for A1298C polymorphism of MTHFR gene.

Keywords: Atherothrombotic, Ischemic, Stroke, Folat, Cycle, Genes

EP-1063 [Miscellaneous » Others]

Call for Volunteer Neurosurgical Mission

András Csókay

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It is a well known difficulties the low number of neurosurgeons in the underdeveloped countries. Beyond the governmental support only by the volunteers work can help this situations. The voluteers neurosurgeons have to perform his job within the very difficult circumstances. We have to face a lot of problem. Absence of electricity, absence of anaesthesia, absence of C-arm, CT, MRI and ect. Absence of bipolar coagulation. How can we deal with these problems? First we have to organize pilot study for mission to appraise the facilities. Very important to organize strong local human support by the church or governmental sources. Daily fresh cadaver excercise in our mother's hospitals at home can simplify our work, and serves a lot of creative options for our work. Taking into consideration the above mentioned methods we start to organize neurosurgical missions in Africa. The participants need to understand and recieve the special call for mission. The deep spiritual touch help us to manage special difficulties we have to face during oue mission. The mission can provide us a lot of development in our moral attitude. We would like to call colleagues to participate in our mission.

Keywords: Volunteer, Neurosurgical mission, Africa

EP-1064 [Miscellaneous » Others]

Evaluation of Apparent Diffusion Coefficients in the Cerebellar Tonsils and Bulbus in Chiari Type I Malformations: Comparison Before and After Surgery

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Aim: To evaluate the preoperative and postoperative mean apparent diffusion coefficient (ADC) values of the cerebellar tonsils and

bulbus in patients with Chiari Malformation Type I (CMI), and to compare the results with those in healthy controls.

Method: We included 15 patients with CMI who underwent suboccipital decompression, upper cervical laminectomy, and duraplasty surgery, and compared them with 10 healthy controls with normal cranial magnetic resonance imaging results. Three regions of interest were placed, one each in the bilateral central parts of the cerebellar tonsils and one in the anterior part of the bulbus. The mean ADC values were then measured separately in each region. Differences of preoperative and postoperative 6th month values were analyzed with the Wilcoxon test, and differences between the patients and controls were analyzed with the Mann-Whitney U test.

Results: Among the patients, mean ADC values were significantly decreased in all three regions after surgery compared with before surgery. The mean ADC values before surgery were significantly higher for patients than for controls; however, although mean ADC values were slightly higher after surgery for patients than for controls, the differences were not significant. Thus, after suboccipital decompression surgery, ADC values in patients with CMI became close to those of normal individuals.

Conclusion: The increased ADC values in patients with CMI before surgery implied that not only morphologic changes but also increased diffusivity may play a key role in the pathophysiology and clinical presentation of the disease. We conclude that decompression surgery can produce favorable diffusional alterations.

Keywords: Apparent diffusion coefficient, Chiari malformation type 1, Diffusion-weighted imaging, Suboccipital decompression surgery

EP-1065 [Miscellaneous » Others]

Endoscopic Access to Occipital Lateral Ventricle Using Permanent Catheters: Technical Note

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The following work is a technical note about a new endoscopic access to lateral ventricle through occipital horn to place ventricles catheters, 20 patient was operated using Deck System of endoscopy with lens of 30 grades, 2,7 mm of diameter and 30 cm of larger, sheets and working canals including. CT scan was performing 24 hours after surgery and optimal position was obtained in 95%. Median distance from occipital bon to frontal horn of the ventricles was 10,5 cm. Any patient present dysfunction of the system and only one patient had a hematoma of the surgical area.

Keywords: Ventricular- peritoneal shunt, Ventricular catheters, Occipital horn

EP-1066 [Miscellaneous » Others]

Chronic Subdural Calcification Developing After Ventriculoperitoneal Shunt: A Case Report

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Calcified chronic subdural hematoma is a rare disease that may be

associated with a previous trauma, inadequate surgical intervention, post-meningitis subdural effusion, and is less likely to be seen as a long-term complication of shunt placement. As the etiology is not well understood, there are variations in treatment choices. It may be seen especially in young patients with chronic hydrocephalus, probably due to craniocerebral disproportion. The precise mechanism of the calcification or ossification of the hematoma is not known, however, the dura mater seems to play a part in this process. The case is here presented of a 30-year old male patient with calcified chronic subdural hematoma after a ventriculoperitoneal shunt. In cases with calcified chronic subdural hematoma, clinical observation may be appropriate in the determination of treatment approaches and the decision for surgery should only be taken after a careful and meticulous investigation. Unnecessary procedures or those likely to cause harm should be avoided.

Keywords: Chronic subdural hematoma, Calcification, VP shunt, Surgery

EP-1067 [Miscellaneous » Others]

Liquid Chromatography/Mass Spectrometric Analysis of Sphingosine in Hippocampus Following Transient Global Cerebral Ischemia in Rats

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Background: Sphingolipid metabolism have been implicated in various pathways as cell growth, differentiation and migration, as well as several pathologies as cancer and stroke. In the recent year the interest in the neuroprotective effects of sphingosine 1 phosphate has been on the rise with new drugs showing promise in pre-clinical trials that target S1P receptors. In this work we attempted to assess the neuroprotective effect of S1P in rat hippocampus following global cerebral ischemia.

Method: Male SD rats were exposed to 2 vessel model of transient global cerebral ischemia. CA1 and CA3 subregions of the hippocampus were extracted and sphingosine metabolism analyzed with LC-MS. Cell death and stress markers were also evaluated with immunohistochemistry, western blot and qPCR.

Results: Cell death was confined only in CA1 sub-region of hippocampus after 72 hours of TGCI evident by Cresol violet staining and by TUNEL staining. Double staining with TUNEL and the neuronal marker NeuN showed neurons of CA1 regions to undergo apoptosis. S1P levels increased in CA3 much earlier than in CA1 although both regions were exposed to oxidative stress as evident by HSP70 mRNA levels. Microglia in CA1 region showed changed morphology and up-regulation of CD163, a marker of phagocytic activity and polarization of microglia.

Conclusion: Early sphingosine 1 phosphate up-regulation is protective against oxidative stress, and our data suggest that failure of CA1 neurons to up-regulate S1P levels early might be linked to their selective vulnerability.

Keywords: Cerebral ischemia, Hippocampus, Neuroprotection, Sphingosine 1 phosphate

EP-1068 [Miscellaneous » Others]

Burr Holes Number and Drain Use in Reoperations and Complications in Chronic Subdural Hematoma

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Background: Chronic subdural hematoma (CSDH) is characterized by bleeding between duramater and arachnoid. The present study aims to evaluate whether the use of drain and or the number of burr holes for treatment of chronic subdural hematoma modify the rates of recurrence and complications.

Method: A retrospective review of the patients operated due to chronic subdural hematoma (CSDH) in a single center (Hospital do Servidor Público Estadual de São Paulo) between 2006 and 2015 was done by service database and medical records.

Results: 155 surgeries in 155 patients were evaluated, with the exclusion of 13 patients due to loss of follow-up (12 cases) and one case of craniotomy as primary surgery. Unilateral Cases: Among unilateral cases, 86 (81.9%) were operated with a single burr hole. Nineteen (18%) were operated with 2 burr holes. Seventy-four (70.4%) used a drain and 31 (29.5%) did not use it. Bilateral cases: Twelve (32.4%) cases were operated with single burr hole of each side and 25 (67.5%) were operated with 2 burr holes. Use of drain: Twenty-two (59.4%) cases used drain and 15 (40.5%) did not use. There was no association between any of the predictor factors studied and the presence of complications, which occurred in 6 out of 142 patients.

Conclusion: The number of burr holes and the use of the drain to treat chronic subdural hematoma did not alter the rates of recurrence and complications.

Keywords: Subdural hematoma, Surgery, Drain, Recurrence

EP-1069 [Miscellaneous » Others]

Meningeal Hemorrhage: About 40 Cases

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Background: The meningeal hemorrhage (MH) is an anatomoclinical entity defined by the presence of blood in the subarachnoid spaces. It is considered a subclass of stroke. Aims of the study are:

- Determine the epidemiological, clinical and etiological features of HM,
- Specify exams making the diagnosis,
- Precise treatment and prognosis.

Method: It is a retrospective descriptive study of 40 patients followed for MH in the neurosurgery department of Habib Bourguiba Hospital, Sfax. We precise the epidemiological, clinical signs of HM, the complementary exams allowing the positive and etiological diagnosis, the therapeutic modalities and the evolution.

Results: The mean age was 53.8 years with a sex ratio of 0.5. HM risk factors were dominated by smoking (50%). Headache and vomiting

were the most frequent signs (39 and 29 cases respectively). The average Hunt and Hess score was 2.1. The cerebral CT allowed the positive diagnosis in 97.5% of the cases. The average Fischer grade was at 2.6. A confirmed arterial aneurysm in 10 patients was treated by surgery or embolization. The prognosis was good (100%).

Conclusion: Arterial hypertension is the main risk factor. Any unusual headache should evoke this diagnosis with emergency realization of a cerebral CT scan. Management in an intensive care unit, an analgesic treatment and the prevention of complications must be implemented. The main cause is vascular aneurysm's rupture. The evolution is pejorative in a general way which was not the case in our series.

Keywords: Meningeal hemorrhage, Stroke, Aneurysm

EP-1070 [Miscellaneous » Others]

The Impact of Finances in Neurosurgery - Greece: Between the Developed and the Developing World

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No one would ever argue the impact of good training in neurosurgery, nor... What doesn't cross the average neurosurgeons mind though is the impact of finances. After the Greek financial recession our hospital cannot afford a microscope, and for what matters not even a Mayfield, a Layla retraction system. And if our hospital is just an awful example, even the more privileged (public) hospitals of the capital do not have intraoperative MRIs, Navigators or blue light microscopes in order to offer current state of the art optimal care for the patients. Although the situation is much better than 3rd world countries who lack overall neurosurgical care, financial austerity can lead even a European country with a (disproportionately) large number of trained neurosurgeons to offer suboptimal care to its citizens.

Keywords: Austerity, 3rd world, Greece

EP-1071 [Miscellaneous » Others]

Chiari Type 4 Malformation with Occipitocervical Meningocele

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The Chiari malformations are a family of conditions characterized by developmental or, less commonly, acquired displacements of the cerebellum. The original 19th century description by Hans Chiari delineated 4 types, but only types 1 and 2 are more than curiosities. In his initial description, Chiari classified the hindbrain malformations into type I, II and III and then latter added type IV malformation. Type IV is a very rare type. It is characterized by cerebellar hypoplasia or aplasia and tentorial hypoplasia. There is no hind brain herniation in this type. We report a case of a 6 year old male patient who presented to us with a 6 year history of an occipitocervical mass and inability to stand and walk, and a 5 month history of headache and vomiting; chronically unwell first born child who was delivered via a normal vaginal delivery.

The mother did not have an antenatal ultrasound scan. She did not suffer from any infections and did not take any medications. No family history of birth defects and malignancies. CT scan of the brain showed a midline posterior fossa bone defect with a meningocele with active obstructive hydrocephalus and hypoplastic cerebellum without hindbrain herniation. A diagnosis of a posterior fossa congenital anomaly (Chiari 4) with obstructive hydrocephalus and occipitocervical meningocele was made. Ventriculo-peritoneal shunt was inserted three days post admission, after which the signs and symptoms of raised intracranial pressure resolved. Patient was then electively taken to theatre five months later for repair of the occipitocervical meningocele.

Keywords: Chiari 4, Hindbrain, Meningocele, Hydrocephalus

EP-1072 [Miscellaneous » Others]

Investigation of the Factors Affecting Disability Level in Patients with Low Back Pain

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Background: This study was planned to investigate the factors affecting disability level in patients with low back pain.

Method: One hundred and ninety-five (126 female; 69 male) patients with low back pain, who applied to Neurosurgery Outpatient Clinic in Pamukkale University between January 2016 and December 2016. Pain intensity, disability level and questions about factors affecting disability level were saved together with demographic characteristics of patients. It was used Visual Analog Scale for determining pain intensity and Oswestry Disability Index (ODI) for disability level.

Results: Mean age of patients was 48.22±16.46 years. Mean of pain intensity was 6.25±2.30 and pain duration 99.45±225.77 weeks. Mean of disability level was 45.45±18.78. 119(61%) of patients while walking, 106(54.4%) of patients when standing for a long time and 103(52.8%) of patients during forward bending stated that an increase the disability level. Mostly, it was seen that walking, not working regularly and going downhill are the factors that increase pain. 137(70.3%) of the patients stated that their daily lives were partially affected because of low back pain, 49(25.1%) of the patients became unable to do anything due to pain and 9(4.6%) of the patients did not affect their daily lives.

Discussion: Because patients of low back pain do not use appropriate body mechanics in their daily routines or not pay attention to protective principles, disability level seriously affects activities of daily living. In this regard, raising awareness of patients is important in terms of preventive precautions.

Keywords: Disability level, Increasing factors, Low back pain, Precaution

EP-1073 [Miscellaneous » Others]

Review of the First Year of Activity of the Neurosurgery Department of the Teaching Hospital of Bouaké Côte d'Ivoire

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Our work is a retrospective study of the first year of activity of the second service of neurosurgery of Côte d'Ivoire, opened at the University Hospital of Bouaké, twenty-five years after the opening of the first service in Abidjan in 1990. The aim was to take stock of this first year of operation in order to make improvements. All patients hospitalized during the period from January 1, 2016 to December 31, 2016 were included in the study. A total of 143 patients were retained for the study, with an average of 12 admissions per month. There were 128 men (89.5%) and 15 women (10.5%). The mean age of the patients was 31 years, with a proportion of 18.18% of children. The average hospital stay was 5 days. Activity was dominated by neuro-traumatology with 113 cases (79.02%) including 100 cases of cerebrospinal trauma and 13 cases of vertebral-medullary trauma. The chronic dural hematoma was second with 10 cases (7%). Infectious pathology (4.9%) was dominated by tuberculosis (4 cases out of 7). Tumor and vascular pathologies shared the fourth place. 19.58% of the patients had surgery (28 cases). 18.75% came out against medical advice. The evolution was favorable in 78% of the cases. The mortality rate was 3.5% and mostly concerned traumatic pathology

Keywords: Neurosurgery, Hospital, Department, Activity, Pathology, Bouaké

EP-1074 [Miscellaneous » Others]

Neurosurgeons' Contribution to Hospital Margin in a Secondary Health Care Service

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Background: There are few studies analyzing neurosurgical contribution to hospital margin. Probably, surgeons and operating room activity are the biggest contributors to hospital net income in any hospital setting. However, numerous variables act at each institution. It is important for neurosurgeons to realize the role they play in generating net income of hospital.

Method: Between 1 November 2016 and 28 February 2017, physicians' monthly total performance-related scores, a measure of volume of activity and physician productivity, were collected from hospital statistical data. Performance-related score of physician is also a measure in calculating payment of physicians in performance-based supplementary payment system. Total performance-related scores of each department were normalized by dividing by the number of physicians who worked at each month and the mean score of each department for the study period was found.

Results: Neurosurgery was found to be the 8th highest contributor

to hospital productivity margin among 28 different departments. (the 7th in clinical specialties and the third in surgical specialties). Among surgical departments, neurosurgery (physician mean score: 28975/month), plastic and reconstructive surgery (physician mean score: 40001/month and orthopedics (physician mean score: 32804/month) were the biggest contributors to operating room productivity and hospital margin. Cardiology, gastroenterology and radiology contributed greatest to hospital margin.

Conclusion: Neurosurgery adds significantly to hospital margin and therefore, is more profitable than many other specialties. Physicians and hospital managers should look carefully at performance related scores and reimbursement data in a cooperative fashion to maximize productivity.

Keywords: Hospital margin, Performance-based score, Operating room productivity, Neurosurgeon productivity

EP-1075 [Miscellaneous » Others]

Does Preoperative Radiologic Imaging Sign Shows the Prognosis of the Decompressive Craniectomy for Stroke ?

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Aim: To investigate the preoperative clinic and radiologic signs which affect the prognosis after decompressive craniectomy for stroke.

Method: We retrospectively analysed the demographic and radiological images of patients who underwent decompressive craniectomy for internal carotid artery (ICA) and middle cerebral artery (MCA) strokes. Seventeen patients analysed retrospectively between January 2012- December 2015 at Katip Celebi University Training and Research Hospital, Izmir, Turkey.

Results: A total of 17 decompressive craniectomy were performed for supratentorial ischemic strokes; 3 (17.6%) ICA and 14 (82.4%) MCA stroke patients. There were 11(64.7%) males and 6 (35.3%) females with an mean age of 59.35 years (range 20-83 years). There were 10 (58.8%) mortalities. Seven patients discharged home. The patients Glasgow Coma Scale, infarct type, dominant hemisphere side, preoperative cranial tomography shift, hemorrhagic transformation, basal cistern, transcalvarial herniation were analysed. Eight (47.1%) patients basal cisterns were open, 9 (52.9%) patients were closed before decompressive craniectomy. There was statistically significant difference between mortality rate between open cistern versus closed basal cistern (p=0.029).

Conclusion: In our study open cisterns were associated with good outcomes. Larger studies should be done in the future.

Keywords: Stroke, Basal cistern, Decompressive craniectomy, Mortality

EP-1076 [Miscellaneous » Others]

A Study on the Patient Positioning Accuracy for Stereotactic Radiotherapy of Brain Lesions

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Background: The purpose of this study is an investigation of the patient positioning accuracy (inter-fraction and intra-fraction shifts) for stereotactic radiation treatment of the brain lesions using invasive Leksell Coordinate Frame G[®] (LFG), non-invasive vacuum-activated head frame system HeadFix[®] (HF) and individual thermoplastic masks (TM), and comparison position errors of these systems.

Method: A total of 532 patients represented study population. LFG, HF and TM were used to immobilize patients during pre-radiation preparation and radiation treatment. Positioning accuracy was estimated using linac-mounted cone beam computer tomography (CBCT) scan system. The target intra-fraction offsets were determined by comparison target positions before and after the irradiation procedures with planning positions. To determine inter-fraction shifts data from daily CBCT scans were used. Statistical samples of target offsets in six coordinates were collected and statistical analysis was carried out.

Results: For 386 patients TMs were used, for 31 LFG and for others 115 HF. Analysis of inter-fraction shifts, based on scatterplots, showed no significant correlations and selected systematic errors in patient's positioning. Quantitative estimations of mean values and standard deviations also demonstrated acceptable accuracy. It was concluded that it's necessary to do daily CBCT control, if shifts at least in one direction are greater or close to 5 mm during first four procedures.

Conclusion: With respect to intra-fraction shifts, due to the slight differences of the offset error results, the choice between LFG and HF should be determined by the individual patient characteristics and does not affect on the accuracy of the delivered dose.

Keywords: Stereotactic radiotherapy, Leksell coordinate frame G[®], HeadFix[®], Positioning accuracy

EP-1077 [Miscellaneous » Others]

Neuroprotective Effect of EGCG Nanoparticles in Experimental Model of Cerebral Ischemia in Mice

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Background: In the present study, the neuroprotective effect of nanoparticles of EGCG (Epigallocatechin Gallate: the active constituent of green tea extract) was examined in bilateral Common Carotid Artery Occlusion (BCCAO) model of stroke in mice during the sub acute phase.

Method: The study was performed in advanced small animal facility, PGIMER, Chandigarh, India after obtaining clearance from Institutional Animal Ethics Committee. The solid lipid nanoparticles (SLNs) of EGCG was developed indigenously in the laboratory. The study was performed in three divided groups of Swiss Albino Mice such as, Group 1 (Sham operated group), Group 2 (Saline treated Surgically operated group) and Group 3 (SLN-EGCG treated surgically operated group). After 14 days treatment period, behaviour study was done and animals were sacrificed. Several parameters were performed such as Brain infarct size, brain edema,

seizure susceptibility scores, reactive oxygen species, cytokines and immunohistochemistry of brain. The data was analyzed by one way ANOVA followed by post hoc Tukey's test. The p value less than 0.05 were considered as statistically significant.

Results: As compared to surgical treated group, EGCG nanoparticles treated group showed significant neuroprotection by ameliorating cerebral infarction, brain oedema, seizure score and improved neurobehavioral outcomes in sub-acute phase (14 days) of study. Nanoparticles of EGCG significantly attenuated the proinflammatory cytokines levels and prevented neuronal cell death.

Conclusion: These results revealed the neuroprotective potential of nanoparticles of EGCG in cerebral ischemia/reperfusion animal model of stroke during the sub acute phase.

Keywords: EGCG nanoparticles, Cerebral ischemia, Neuroprotection, Swiss Albino Mice

EP-1078 [Miscellaneous » Others]

Determination of Anxiety Level about Surgery in Patients with Low Back Pain on Preoperative Term

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Aim: To investigate preoperative pain intensity and anxiety level related to surgery in patients scheduled to lumbar surgery.

Method: One hundred and twenty six lumbar surgery scheduled patients (82 female, 44 male) due to various reasons were included in study. Patients' demographics and clinical data were documented and patients were asked whether they were worried about surgery. State-Trait Anxiety Inventory (STAI-I) was used to measure state-trait anxiety and Visual Analog Scale (VAS) was used to investigate pain intensity on preoperative term.

Results: The mean age of patients was 53.11±15.37 years. The mean pain intensity was 5.27±3.45. The mean STAI-I score was found 46.98±17.55 on preoperative term. Although 101(80.2%) of patients were informed about surgery, postoperative care etc., 25(19.8%) of patients were not informed, yet. While 60(47.6%) of patients had anxiety about surgery, 66(52.4%) had not. Ninety-six (76.2%) of patients stated their pain was constantly. Twenty-two (17.5%) of patients had pain, occasionally. Three (2.4%) patients had pain, rarely. There was a positive correlation between pain intensity and state-trait anxiety (p=0.047, r=0.177).

Discussion: Anxiety level of patients were high on preoperative term. It was observed that as pain intensity increases, state of anxiety also increases. We believe it is important that to be informed the patients about surgery is reduced anxiety, before surgery.

Keywords: Anxiety, Lumbar surgery, Pain intensity

EP-1079 [Miscellaneous » Others]

Strategic Plan for Management of Intracranial Arachnoid Cysts

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Background: Arachnoid cysts are intracranial collections of cerebrospinal fluid, either simple or complex cysts. They are mainly congenital in origin. Open surgery with cyst excision, cyst fenestration, ventriculocystostomy, stereotactic aspiration and cyst peritoneal shunting are different treatment options that are advocated. Pure endoscopic treatment of arachnoid cysts provides a minimally invasive method, also endoscopic assisted microscopic techniques through mini craniotomy can provide a minimally invasive method for certain types of arachnoid cysts depending on their intracranial anatomical location.

Method: This study includes 50 cases of arachnoid cysts in different intracranial location, either supra or infra tentorial were operated using the endoscope alone as in cysts related to quadrigeminal cistern, or endoscopic assisted microscopic technique as in sylvian and posterior fossa cysts. Five cases were managed conservatively without surgical intervention.

Results: We have achieved accepted results with follow up to 7 years with low morbidity and no mortality in our series.

Conclusion: Endoscopic technique applied by experienced endoscopic neurosurgeons harbors a very low complication rate and results in very favorable long-term results, conservative treatment for certain types of arachnoid cysts should be considered.

Keywords: Endoscope, Endoscopic assisted microscopic, Arachnoid cysts, Minimally invasive techniques, Ventriculocystostomy

EP-1080 [Miscellaneous » Others]

Neuroendoscopy in Kuwait: Evolution, Current Status and Future Directions

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An overview of the development of neuroendoscopy in the neurosurgery department, Ibn Sina Hospital in Kuwait is presented, with an outline of difficulties and obstacles faced until the field has reached its current status. After a modest beginning few years ago, endoscopic skull base procedures, intraventricular neuroendoscopy and spinal endoscopy are being currently regularly performed in the department. The factors and solutions that helped us overcome these problems are also elaborated upon. Although neuroendoscopy is not per se a neurosurgical subspecialty, it is an area that requires special training on the side of neurosurgeons. Achieving an appropriate level of care for patients undergoing neuroendoscopic procedures necessitates these highly-trained neurosurgeons to collaborate together and with colleagues from other specialties in order to create team works geared towards treating such patients. Importantly, a multitude of essential facilities should be available in order to make such a pattern of practice possible. In our experience,

this was made possible through continued efforts that have finally paid off and gradually led to a complete shift of the face of neuroendoscopic practice in our department. Our future endeavors aim at further development of neuroendoscopy in the department so as to create a center of excellence.

Keywords: Endoscopic endonasal surgery, History, Neuroendoscopy

EP-1082 [Miscellaneous » Others]

Exceptional Location of an Arachnoid Cyst

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Bulbomedullary junction arachnoid cyst is an exceptional location. These benign cysts whose pathogenesis is not known, the congenital theory is often evoked. It is an arachnoid encystment filled with cerebrospinal fluid. Symptoms are produced by the mass effect of the cyst on surrounding structures. We report a case of bulbomedullary junction arachnoid cyst in a young man of 24 years; operated at the neurosurgery department of the University hospital of Annaba, benefiting a total removal. A male; aged 24 years, without a history individuals whose symptoms goes back 3 years before admission by neck pain, aggravated it a few months ago by the onset of headache and vomiting. Clinical data: a syndrome of intracranial hypertension, vertigo, weakness of all four limbs. The MRI objectived an intracranial expansive process of the bulbomedullary junction with compression of this part. This process appears hypointense T1 and FLAIR; hyper intense T2 thin wall not raised after contrast agent injection evoking an arachnoid cyst. The patient was operated; total removal of the cyst. The postoperative Evolution was good. The symptoms disappeared. Histological study confirms that it is an arachnoid cyst. Only a few cases of bulbo-medullary junction arachnoid cysts was reported. Clinical conditions that can cause various neurologic symptoms. The benefits and risks of surgical treatment should be discussed.

Keywords: Bulbo-medullary junction, Arachnoid cyst, Neurosurgery

EP-1083 [Miscellaneous » Others]

Investigation of the Factors Affecting Pain Intensity in Patients with Low Back and Neck Pain

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Background: This study was planned to investigate the factors affecting pain intensity in patients with both low back and neck pain.

Method: Seventy-nine (56 female; 23 male) patients with both low back and neck pain, who applied to Neurosurgery Outpatient Clinic in Pamukkale University between January 2016 and December 2016. Pain intensity and questions about factors affecting pain were saved together with demographic characteristics of patients. Visual Analog Scale was used to determine pain intensity.

Results: Mean age of patients was 46.27 ± 14.95 years. Mean of pain intensity was 6.43 ± 2.35 and pain duration 125.62 ± 218.47 weeks. 53(67.1%) of patients was not working and 26(32.9%) was working regularly. 66 (83.5%) of patients do not have habit of exercise and 13(16.5%) of patients doing exercise regularly. 45(57%) of patients said their pain was constantly, 33(41.9%) of patients said their pain was occasionally, 1(1.3%) of patients said their pain was rarely. 63(79.7%) of patient when working with computer, 62(78.5%) of patients when going downhill and 62(78.5%) of patients when working stated that an increase the pain intensity. Mostly, it was seen that walking, female gender and getting out of the bed are the factors that increase pain.

Discussion: It has been observed that the lack of regular exercise habits and not paying attention to ergonomic regulations during work increase the intensity of pain. Patients should be trained to gain exercise habits and explain ergonomic arrangements in the working environment.

Keywords: Affecting factors, Ergonomic arrangements, Exercise habits, Low back pain, Neck pain

EP-1084 [Neuroanatomy » Spinal and Peripheral Nerve]

An Uncommon Case Mimicking Cervical Trauma: Os Odontoideum

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Os odontoideum is a separate odontoid process from the body of the axis. It is the most common anomaly of the odontoid process. The etiology of os odontoideum remains controversial, although there is emerging consensus on both traumatic etiology and a congenital source. Patients with this condition can be asymptomatic or present with a wide range of neurological dysfunctions. It may cause cervical instability, atlantoaxial dislocation and myelopathy. This anomaly can mimic Type I and II odontoid fractures. Accurate diagnosis is mandatory to prevent treatment failures. There is a role for conservative treatment of an asymptomatic incidentally found, radiologically stable, and non-compressive os odontoideum. However, surgical treatment has a definitive role in symptomatic cases. In this study, the case is presented of a 31 year- old male patient with neck pain who was diagnosed with incidental os odontoideum. The diagnosis of acute odontoid fracture was discarded in this case as the radiological findings were of a characteristic cortex with smooth contours, and there was no history of recent trauma, sclerosis or hypertrophy of the anterior tubercle of the atlas.

Keywords: Os odontoideum, Congenital, Cervical trauma, Cervical instability

EP-1085 [Neuroanatomy » Spinal and Peripheral Nerve]

Discovery of Taste Roseas of Reproductive Organs Stimulated by Seminal Fructose and Roles of Orgasmic Sensation: Experimental Study

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The basic mechanism of orgasmic pleasure has not been elucidated, although there is a broad similarity between taste and orgasmic sensation. Taste buds of the tongue have been well described, and taste information has been established as an important regulator of food selection and nutrition. However, very little is known regarding how pleasure sensation is created and perceived in an orgasm. Thus, we investigated whether there were taste bud-like structures stimulated by seminal fructose in the male urethra and glans penis. To confirm this hypothesis, we histologically examined the urethral tissues of male rabbits. We discovered that the male urethra and glans penis contained many taste bud-like structures similar to the taste buds of the tongue. Interestingly, these taste bud-like structures of the tongue were detected in the intramural openings of the urethral lacunae and glandular surfaces. These structures have neuron-like appendages at the apical ends of rose buds in the wall of the urethra and glans. Moreover, each urethral plica contained some taste buds that were particularly more dense in the distal urethra and glans penis. We hypothesized that the pelvic autonomous nerves innervated both the urethral and glans taste buds and conveyed orgasmic sensation from the urethral taste buds to the taste information- computing centers in the brain. We postulated that urethral taste buds are stimulated by seminal fructose, and supplying nerves may play a predominant role in the creation of orgasmic sensation, which has not yet been well studied thus far (Our Book: Taste Rosea of Hedonia/Amazon.com).

Keywords: Taste rosea, Orgasm, Reproductive organs

EP-1086 [Neuroanatomy » Cranial]

Surgical Anatomy of Orbit

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Background: The orbit is a pyramidal cavity with its base in front and its apex behind and is a potential site for pathological processes such as tumors and vascular malformations. Knowledge of orbit anatomy, nerves and vascularization is essential to perform accurate microsurgical procedures in this region.

Method: We performed the microdissection of orbital fascia, relationship between nerves and others orbital structures. Anatomy of orbit was studied in serial human cadaver head. And they were dissected with the aid of an operating Microscope.

Results: We dissected the orbital fascia from the wall and, nerves and blood vessels of the orbit, the origins of the orbital muscles was from its insertions. Using the same rationale, we was performed microdissection the structure of the eye. The eyeball is embedded in orbital fat but is separated from it by the fascial sheath of the eyeball.

Conclusion: Complete comprehension of relationship between different anatomical structures into the orbit, are prerequisites to accomplishing appropriate surgical planing and, ultimately, to completing successful exploration and removal of pathological lesions in this region.

Keywords: Anatomy, Orbit, Surgical, Tumors

EP-1087 [Neuroanatomy » Cranial]**Calvarial Hyperpneumatization with the Complaint of Headache in a 67 Year Old Man**

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The aim of this presentation is to present diffuse hyperpneumatization of all calvarial bones, skull base and atlas in a patient and to discuss possible pathophysiological mechanisms. A 67 year-old man was admitted with complaint of headache for a long time. He had no history of head trauma, otitis media or vertigo. Physical examination revealed no evidence of fever, feeling of fullness in the temporal region, a palpable swelling, rhinorrhea, or otorrhea. There was not a neurological finding except a slight right sensorineural hearing loss. Tympanic membrane was intact. CT scan confirmed hyperpneumatization of the diploic space of frontal, occipital, parietal, temporal bones symmetrically and bilaterally and of atlas also. Extrathecal CSF leakage was not determined by CT cisternography with intrathecal contrast administration and by the radionuclide cisternogram imaging. Calvarial hyperpneumatization is thought to result from dysfunctional eustachian tube, causing increased middle ear pressure and air entering calvaria through mastoid sinus. Various theories have been proposed for the cause such as ball valve mechanism, recurrent Valsalva maneuvers, excessive coughing and high altitude travel. Mastoid pneumatization occurs during childhood with air cells becoming visible by about 6 months of age and air cell development ceases after that. Hyperpneumatization of all calvarium bones is an exceptionally rare condition. It can be considered that hyperpneumatization of all calvarium developed before the closing of the sutures. But because of the hyperpneumatization in the atlas, the case may be an unexplained congenital condition that occurs before the somites are separated. Or the patient may have an undiagnosed bone structure disease

Keywords: Hyperpneumatization, Eustachian tube, Congenital

EP-1088 [Neuroanatomy » Cranial]**Anatomical Relation Between the Chiasma and Its Surrounding Structures and Prefixed Chiasma in the Dissected Patients at Tabriz Forensic Organization**

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Background: Optic chiasma has an X-shaped structure that is located inferior to hypothalamus. Rhoton introduces three different relationships between optic chiasma and its surrounding elements: Prefixed chiasma, wherein optic chiasma is located superior to the tuberculum sellae. The second one is known as normal variation in which the optic chiasma is located superior to diaphragm sellae and includes 70% of case and the last one is postfixed chiasma. The aim of this study is to evaluate anatomical relationship between the optic

chiasma and its surrounding structures and prefixed chiasma in the dissected patients in Tabriz forensic organization.

Method: This is a cross-sectional study and consist all patients which dissected in Tabriz forensic organization with legal authority during one year.

Results: In this study there were 50 cadavers that 34 of them were male and 24 of them were female. Prevalence of prefixed chiasma was 18%, normal variant was 78% and prefixed chiasma was 4%. Also appearance of diaphragm sellae was concave in 40%, flat in 44% and convex in 10% of cases. 6% of cadavers have prominent tuberculum sellae. 66% of cases had round and 34% of them had elliptical sellae.

Conclusion: Defining of different variants of sellar region and its relation with surrounding structures is very important while accessing to sellar regions pathologies. Results demonstrated those three quarters of cases have normal variant of optic chiasma and about one fifth of them have prefixed chiasma and postfixed chiasma is very low.

Keywords: Optic chiasma, Dorsum sellae, Tuberculum sellae

EP-1089 [Neuroanatomy » Cranial]**Neuroanatomical Basis of Neurotensinergic Pathways in Pain: Contribution of Periaqueductal Gray Matter**

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Neurotensin (NT) is an endogenous neuropeptide, which has a variety of binding sites throughout central system i.e. cortex, amygdaloid complex, medial and lateral thalamus, periaqueductal gray matter (PAG), dorsal raphe nucleus, superior colliculi, rostral ventromedial medulla (RVM) and spinal dorsal horn (SDH).

The PAG integrates inputs from a variety of higher brain regions and modulates nociception via a descending pathway. NT receptor 2-immunoreactive (IR) neurons in the RVM receive NT-IR projections originating from the PAG; express NT and send projections that terminate in laminae I and II of the SDH. PAG receives relatively dense innervations of NT-IR nerve fibers, some of which might come from amygdala. Microinjection of neurotensin into PAG results in a potent analgesic effect. Antinociception is mediated via projections from the amygdala to the ventral PAG. Amygdala stimulation produces antinociception which is mediated by neurotensin release within the ventral PAG.

Management of painful peripheral neuropathies remains challenging. Intrathecally administered neurotensin A analogue found to be effective and well tolerated in a Phase IA clinical trial in patients with chronic pain. Neuroanatomical findings about neurotensinergic pathways guide researchers to investigate agents affecting this system in pain conditions.

Keywords: Neurotensin, Periaqueductal gray, Pain

EP-1090 [Neuroanatomy » Cranial]

Anatomy of Sulcus and Gyrus of the Lateral Surface of the Occipital Lobe

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Background: The occipital lobe has 3 surfaces: lateral, medial and inferior. The sulcus and gyrus in the lateral surface present a very wide variation in its form and trajectory among population. There are scarce works in the literature about variability of microsurgical anatomy of the occipital lobe. Our aim is to describe the microsurgical anatomy of sulcus and gyrus of the lateral surface of occipital lobe in tridimensional stereoscopic anaglyphs images.

Method: 73 adult human brain hemispheres were fixed in formaldehyde 10% and prepared by Klingner modified method. The lateral surface of each occipital lobe was examined in all hemispheres with aid of a surgical microscope.

Results: Transversal occipital sulcus was found in 100% of specimens, being the most constant sulcus in the lateral occipital surface. Lateral occipital sulcus was found in 98.7% of specimens of which 52% resulted of a prolongation of superior temporal gyrus. Lunate sulcus was found in 84% of specimens, 76% of these had a concavity directed towards occipital pole. Pre-polar occipital sulcus was found in 74.8% of specimens and showed a concavity directed towards occipital pole. Superior occipital gyrus and inferior occipital gyrus were almost constant, polar occipital gyrus was found only in 52.2%.

Conclusion: The microsurgical anatomy of the lateral surface of occipital lobe presented a wide variability among the studied population. Is important to know the variability of microsurgical anatomy of the lateral surface of the occipital lobe, classically underestimated.

Keywords: Sectional anatomy, Brain cortex, Cerebral hemispheres, Occipital lobe

EP-1091 [Neuroanatomy » Cranial]

Eustachian Tube Subtemporal Exposure; Anatomical and Radiological Descriptive Study

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Background: A structure that often is missed in classic descriptions of surgical skull base anatomy is Eustachian tube (ET). Our aim was to define the relationship between ET and its surrounding

structures when performing a subtemporal exposure to highlight potential surgical risks.

Method: ET was exposed along the full length of the intracranial course and was evaluated in relation to petrous Internal Carotid Artery, ICA bony canal wall thickness separating ET laterally, foramen spinosum (FS), foramen ovale (FO), bony intervals between ET, and superior surface of ET relationship to the anterolateral triangle of the middle fossa. 420 axial computed tomographic angiography (CTA) scans were studied to assess the same measurements.

Results: Bony part of ET was located just lateral to the superior surface of ICA turn from the vertical to horizontal portion of petrous ICA. Petrous ICA was covered laterally by a portion of the bony segment of ET with an average length of 6 mm. Wall formed between hpICA and ET, increased in thickness as coursing anteriorly, averaged 0.85 mm in radiological and 2.25 mm in cadaveric study. ET-FS bony interval was 3.6 mm in the cadaveric and 1.31 mm in radiographic study. ET-FO bony interval was 2.65 mm in length in cadaveric and 1.56 mm in radiological study.

Conclusion: Knowledge of ET relationship to petrous segment of the ICA, FS, FO, and maxillary and mandibular divisions of trigeminal nerve is useful during skull base surgery to avoid ET injury and its subsequent complications such as cerebrospinal fluid leak, infection, and hearing disturbances.

Keywords: Eustachian tube, Skull base, Subtemporal

EP-1092 [Neuroanatomy » Cranial]

The Anatomy of Circulus Arteriosus Cerebri (Circle of Willis): A Study in Turkish Population

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Background: The function of the circle of Willis, an arterial polygon, is to protect the brain from ischemia. The aim of this study is to define the structural characteristics of the circle of Willis within the Turkish adult population, along with variations and arteries involved in the measurement of diameters and lengths on cadavers.

Method: The circle of Willis was evaluated in 100 fresh adult cadavers. Structures of the circle of Willis were evaluated as being typical or atypical images and according to the diameter of AComP. All arteries forming the circle's length and diameters were measured.

Results: All arteries forming the circle of Willis as 91% were anatomically observed. The typical structure in which hypoplasia arteries is not involved was obtained as 8%. The atypical circle of Willis with aplasia was seen as 9%. 87% of adult, 9% fetal, and 4% transitional configuration in the samples were detected. The variations of the circle of Willis were more common in the posterior portion. Hypoplasia was found to be the most common variation and noted as a maximum in AComP (85%). Aplasia was noted as the second most common variation after hypoplasia and again the most common in AComP (5%).

Conclusion: Advances in radiological methods which provide images of cerebral vessels and the development of cerebrovascular surgery have increased the importance of the circle of Willis in neurosurgery and neurology. The structure of the circle of Willis is of great importance in occlusive cerebrovascular diseases and cerebrovascular surgery.

Keywords: Neuroanatomy, Neurovascular, Cerebral arterial circle, Willis polygon, Variation

EP-1093 [Neuroanatomy » Cranial]

Neuroanatomical Basis of Glasgow Coma Scale—A Reappraisal

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Glasgow coma scale was postulated by Jennet and Teasdale in 1974 as a practical method for bedside assessment of impairment of conscious level, the clinical hallmark of acute brain injury. The aim is to categorize the patients with traumatic head injury into mild, moderate and severe head injury. Originally it had total score of 14 but later, further categorization of normal and abnormal flexion (withdrawal and decorticate) led to revised total score of 15 points. This has stood the test of time for over 40 years now. GCS score also has predictive value on the prognosis and the outcome of the patient. GCS emphasizes how brain integrates, comprehends and analyzes different functional aspects by incorporating three independent variables in the score system. It is therefore prudent for reappraisal on the neurology behind the GCS score. It has vast implications in the fields of neurology and neurosurgery. But lack of proper understanding in the neuro-anatomical basis of the score is the Achilles heel in proper utilization of the same. Herein we review the anatomical aspects behind each variable in the score.

Keywords: Glasgow coma scale, Variables, Anatomy

EP-1094 [Neuroanatomy » Cranial]

Prevalence of Neoclassical Facial Canons in Young Sudanese Adults, Khartoum 2015

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Background: The study of craniofacial anthropometry is very important because knowing the absolute and relative variations of the shape and size of human faces is a cornerstone for planning of plastic and reconstructive procedures involving the craniofacial complex. Despite disproval of neoclassical canonical assumptions by many studies, it remains pivotal in any study of craniofacial anthropometry. This study is addressing this issue among Sudanese. The aim of this study is to measure the prevalence and proportion of neoclassical facial canons among Sudanese who are aged from 18 to 30.

Method: This study was descriptive cross-sectional study. The craniofacial complex measurement was obtained with direct anthropometry using of digital sliding and spreading callipers.

200 Sudanese Arab volunteers were enrolled in the study with an age range between 18 and 30 years. Data was analysed by SPSS computer program.

Results: Means of all facial measurements are significantly higher among males than females except for the forehead height. Sudanese faces showed statistically significant poor compliance with both vertical and horizontal neoclassical facial canons. The most frequently occurring vertical canon is the naso-aural proportion among 21% of females and 14% of males. While the most frequent horizontal one is the orbital canon among 36% of females and 25% of males.

Conclusion: Sudanese faces are longer and slightly narrower than other populations. Genetic proximity alone cannot explain these differences. These results can be used as baseline data regarding facial anthropometry among Sudanese. It may be used also by reconstructive and neurosurgeons. Further studies among other Sudanese ethnic groups are recommended.

Keywords: Anthropometry, Neoclassical, Facial canons, Sudanese Arabs

EP-1095 [Neuroanatomy » Cranial]

White Fiber Dissection of the Brain and Its Relevance to Surgery

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Background: Fiber dissection technique was used to study the various fiber bundles of the brain that included association, commissural and projection fibers. The relation of the fibers to normal anatomical structures and their relevance to surgery was studied. The relationships of fiber tracts to various tumors were studied using diffusion tensor imaging.

Method: Ten previously frozen and formalin-fixed cadaveric human brains were used. The fiber dissection techniques described by Klingler were adopted. The primary dissection tools used were handmade, thin and wooden and curved metallic spatulas with tips of various sizes. The fibers were studied by the naked eye and with the use of magnification.

Results: The course, length and anatomical relations and function of the various fibers of the brain is delineated along with their surgical relevance. Resections that extend through the roof of the temporal horn more than 30 mm behind the temporal pole cross the Meyer's loop. For approaches through the middle temporal gyrus, resection through the lateral wall of the temporal horn more than 55-60 mm behind the temporal pole may cross the optic radiation during their course here on the lateral wall. The course and the anatomy of the limbic system is delineated. An orbital cortical approach to reach the frontal horn is shown.

Conclusion: Fiber dissection of the brain delineates the anatomical details of the tracts clearly and assists in providing a three dimensional perspective. Knowledge of location of major white fiber bundles helps in planning trajectory and in preventing post-operative deficits.

Keywords: White fiber dissection, Surgery, Function, Approches

EP-1096 [Neuroanatomy » Cranial]**Internal Carotid Artery Agenesis Associated with Secondary Tremor (Case Report)**

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Agenesis of the internal carotid artery (ICA) is an extremely rare congenital anomaly and the association of ICA agenesis and tremor is less common. We present an unusual case of left ICA agenesis, which is associated with tortuous distal basilar artery and a dolichoectatic left posterior communicating artery (PCoM) with compression of left subthalamic nucleus (STN). A 67-year-old, right-handed woman, presented at our clinic with postural and rest tremor of the head and right upper limb. A computed tomography angiogram revealed agenesis of the intracranial portion of left ICA and complete absence of carotid canal of the left temporal bone. A digital subtraction angiography of the left vertebral artery showed a kink of distal basilar artery and a dilated, calcified left PCoM, which supply the left middle cerebral artery. This prominently enlarged collateral vessel compresses the left STN and determines the tremor of head and right hand.

Keywords: Internal carotid artery, Agenesis, Secondary tremor, Compression of the brain, Subthalamic nucleus

EP-1097 [Neuroanatomy » Cranial]**An Anatomical Study Comparing Contralateral and Conventional Ipsilateral Approaches to the Medial Wall of the Ophthalmic Segment of the Internal Carotid Artery**

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Background: Medially pointing aneurysms of the ophthalmic segment of the internal carotid artery (oICA) present a challenge to neurosurgeons. Conventional ipsilateral approaches usually require ICA and optic nerve (ON) mobilization and clinoidectomy, all associated with increased surgical risk and morbidity. A contralateral approach could provide a better exposition of oICA's medial wall, ophthalmic artery (OA) and superior hypophyseal artery (SHA) sparing the need of clinoidectomy and minimizing ICA or ON mobilization. However the microsurgical anatomy of this approach has not yet been studied systematically.

Method: We performed a systematic cadaveric study comparing contralateral and conventional ipsilateral approaches in a total of 16 oICAs of 8 specimens (altogether 16 ipsi- and 16- contralateral approaches).

Results: The optimal angle to approach the ipsilateral oICA was $15.4^{\circ} \pm 4.1^{\circ}$ posteriorly to the McCarty keyhole, while the contralateral oICA was reached with an angle of $17.5^{\circ} \pm 4.3^{\circ}$ anteriorly to the keyhole, sparing Sylvian fissure dissection and requiring only minimal frontal lobe retraction. The ipsilateral and contralateral oICA were found at a depth of 49.2 ± 1.8 mm

and 65.1 ± 1.5 mm respectively. The exposure of the medial wall of oICA was 7.25 ± 0.86 mm contralaterally without ON mobilization and 2.44 ± 0.51 mm ipsilaterally after clinoidectomy. All statistical analysis demonstrated that contralateral approaches provided a significantly higher exposition of OA, SHA and oICA's medial wall with its perforant branches ($p < 0.01$).

Conclusion: Our findings suggest that contralateral approaches enable a successful exposure of these structures despite their deeper localization, minimizing the need of risky maneuvers, especially ON mobilization, and requiring only minimal frontal lobe retraction.

Keywords: Ophthalmic, internal carotid artery, contralateral approaches

EP-1098 [Neuroanatomy » Cranial]**Microsurgical Anatomy of the Cavernous Sinus with Special Reference to the Dural Layers: Surgical Corridors Approach Applications and Cases Report**

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The walls of the cavernous sinus was studied in 15 cadaver heads (30 specimens) fixed in formalin. The heads were placed in a Sugita head holder and turned 450 from the side of dissection. The dural of the lateral, superior and posterior wall of the cavernous sinus is formed of two layers: a smooth superficial layer and a thin less defined deep layer. The superficial layer of the superior wall is continuous medially with the diaphragm sellar and the deep layer with the upper part of the medial wall of the cavernous sinus which coincides with the pituitary capsule. The bottom part of the medial wall corresponds to the endosteal dura of the carotid canal. The anterior wall of the cavernous sinus is in contact with the superior orbital fissure and clinoid space at the top. The purpose of this study is to consider the surgical strategies noticing surgical interlayer's corridors through membranes respecting these important anatomical structures and eight cases report of cavernous sinus tumors using lateral and upper interdural corridor performing resection macroscopic total in six cases and subtotal two cases. He approach surgical here described allows a better exposure of the area of the breast cavernous taking the control visual of various structures anatomical important using them runners natural interdural with minimum retraction brain. Whereas the objective surgical to the age of the patient, location and extension of the tumor, as well as to the picture clinical presurgical.

Keywords: Microsurgical anatomy, Cavernous sinus, Dural layers

EP-1099 [Neuroanatomy » Cranial]**Microsurgical Anatomy of the Transcondylar, Supracondylar and Paracondylar Extensions of the Far-Lateral Approach**

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Background: The basic far lateral exposure is an infero-lateral extension of the lateral sub-occipital approach. It is a workhorse

approach for the treatment of extra-axial and intra-axial lesions located anteriorly to the dentate ligament. The goal of the reported study is to review the relevant anatomy of the far-lateral exposure and its transcondylar, supracondylar and paracondylar extensions.

Method: Five dry skulls and 5 formalin-fixed adult heads were used. The skulls were studied under necked eye before and under microscope afterwards. Some measurements were obtained between structures considered to be important bony landmarks. The heads were secured in a head-holder to perform a stepwise microscopic dissection of the posterior and postero-lateral skull base. A transcondylar, supracondylar and paracondylar far-lateral approach was performed to study the area mainly exposed by each variation.

Results: Transcondylar approach is directed through the occipital condyle and offers an unobstructed view of the lower clivus and pre-medullary area. Supracondylar approach is directed through the supracondylar fossa and provides a direct access to the area involving the jugular tubercle and the hypoglossal canal. Paracondylar exposure is conducted through the posterior aspect of the jugular process of the occipital bone and offers a tailored access to posterior aspect of the jugular foramen.

Conclusion: A perfect knowledge of the anatomy of the postero-lateral skull base and the foramen magnum is mandatory to perform safely the basic far-lateral exposure, as well to exploit all the advantages of its variations according to the different lesions to treat.

Keywords: Microsurgical anatomy, Foramen magnum, Skull base, Occipital condyle, Cranio-vertebral junction

EP-1100 [Neuroanatomy » Cranial]

Surgical Anatomy of Cerebellopontine Angle (CPA)

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Comprehensive descriptions of the related surgical anatomy and the specific surgical strategy, tactics, and techniques can be found in earlier publications. In this paper the authors correlate the surgical aspects of different structure and regional lesions into the cerebello-pontic angle. The authors performed the current study to elucidate further this region's detailed anatomy, function and illustrated. Human cadavers underwent dissection of their cerebello-pontic angles and detailed observation and approaches were made of them. Cerebello-pontic angle was found the relationships between the cranial surface and the CPA Osseous and muscular relationships, transverse and sigmoid sinuses, and external surgical landmarks. Relationships among CPA nerves and brainstem. CPA upper neurovascular complex. Lower neurovascular complex of the CPA. Middle neurovascular complex of the CPA. The aim of this study was to evaluate different approach as a potentially more time-efficient intervention, less traumatic procedure for the patient.
Keywords: Posterior fossa, Cerebellar, Tumors, Retrosigmoid craniotomy, Anatomy

EP-1101 [Neuroanatomy » Cranial]

Preoperative Simulation and Intraoperative Monitoring for Skull Base Lesions

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Background: Nowadays, development of information and communication technology is remarkable especially in imaging diagnosis and monitoring modality. So, we investigated the usefulness of preoperative simulation and intraoperative monitoring for cerebral aneurysm and skull base tumor by multimodal as the substitutional tool.

Method: From 2008 to 2016, we experienced totally 219 surgical clippings and 38 skull base tumors with preoperative simulation by CTA, DSA and MRI. 3D Imaging server and PACKs server were same company of FUJIFILM. The software is SYNAPSE VINCENT and AZE. Immediately after CTA imaging, we can reconstruct and simulate preoperatively everywhere on PC medical recording system in same institute. By using FIESTA image, we can find the cranial nerve identification and fusion image with CTA or DSA was useful.

Results: In case of hypervascular tumor like large hemangioblastoma, fusion image CTA with 3D-DSA was useful for surgical strategy. In large petroclival meningioma, not only the simulation but also intraoperative cranial nerve monitoring were necessary for success. Preoperative simulation by operator himself is most important, and imaging more uncomfortable situation is recommended. Preoperatively operator should be positive for surgery after all risk hedges. Some small vessels were not able to visible due to increased ICP or other reasons. We can monitor the all motor cranial nerves by direct stimulation and transcranial MEP.

Conclusion: We have evolved a strategy of surgery for difficult cerebral aneurysms and skull base tumors due to development of information and communication technology; however, we should pay attention to several pitfalls and remained problems.

Keywords: Preoperative simulation, Intraoperative monitoring, Skull base tumor, Cerebral aneurysm, Meningioma, Hemangioblastoma

EP-1102 [Neuroanatomy » Cranial]

Assessment of the Circle of Willis with Cranial Tomography Angiography

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The circle of Willis is a major collateral pathway important in ischemic conditions. The aim of our study was to assess the structural characteristics of the circle of Willis within the Turkish

adult population, along with variations and arteries involved in the measurement of diameters and lengths on cranial computed tomography angiography (CTA). One hundred adult patients who underwent CTA images were evaluated retrospectively. Results of the study revealed 82% adult, 17% fetal, and 1% transitional configurations. A complete polygonal structure was observed in 28% of cases. Variations of the circle of Willis were more common in the posterior portion. Hypoplasia was found to be the most common variation and was observed as a maximum in the posterior communicating artery (AComP). The patency and size of arteries in the circle of Willis are important in occlusive cerebrovascular diseases and cerebrovascular surgery. Although CTA is an easily accessible non-invasive clinical method for demonstrating the vascular structure, CTA should be evaluated taking into account image resolution quality and difficulties in the identification of small vessels.

Keywords: Cerebral angiography, Cerebral arteries, Circle of willis, Tomography scanners, X-ray computed

EP-1103 [Neuroanatomy » Cranial]

Endoscopic Anatomy of the Pterygopalatine Fossa

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The pterygopalatine fossa (PPF) is a small area centrally located in the head, with many important vascular and nervous structures crammed together. This makes it surgically important. Although there are previous reports on the anatomy of the PPF, a detailed and schematic description focusing in the microsurgical endoscopic anatomy is lacking. We dissected six PPF in three cadaveric specimens prepared with intravascular injection of colored material. An endoscopic endonasal approach, including a wide nasoastral window and removal of the posterior antrum wall, provided access to the PPF. Our results using an endoscopic approach we identified the IMAX, V2, foramen rotundum, GPN and their relation within skull base. Also identified a pyramidal shaped bone formed by vidian nerve and its apex marks the ICA. A Clear Understanding Of The Anatomy Of The Endoscopic Endonasal Approach to PPF Region Is Essential In The Planning And Safe Execution.

Keywords: Pterygopalatine fossa, Endoscopic endonasal approach, Endoscopic approach

EP-1104 [Neuroanatomy » Cranial]

Bony Dehiscence of the Anterior Ethmoidal Artery: A Proposed Classification System and the Impact on Endoscopic Transnasal Ligation

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Due to a normal anatomical variation, the AEA can be found within the anterior ethmoidal canal (AEC) or outside of the canal in a dehiscence state. We evaluate the variability of and classify bony dehiscence, assess its impact on endoscopic transnasal ligation, and attempt to identify its extent on corresponding computed tomography (CT) scans. Using 20 preserved adult cadaveric heads (40 sides) injected with colored latex, endoscopy was used to identify both the surgical anatomy of the AEA, and the degree of bony dehiscence. A novel classification system based on degree of bony dehiscence was applied, where the AEA was; completely within the skull base (grade I), protruding from the skull base (grade II), attached to the skull base by bony mesentery (grade III), and completely free of bony attachment (grade IV). The AEA was identified in all 40 sides. Ten percent were graded as type I, 32.5% as type II, 52.5% as type III, and 5% as type IV. Ligation or cauterization was deemed feasible in all type III and IV AEAs, this equaled 57.5% of sides. CT was able to identify a bony mesentery in all grade III AEAs and the absence of a bony connection in the I grade IV head. Bony dehiscence is a common anatomical variation of the AEA, the extent of which will have technical implications on surgical practice. The presence of a bony mesentery (type III) or complete dehiscence (type IV) will permit more effective ligation compared to type I and II AEA.

Keywords: Anterior ethmoidal artery, Dehiscence, Endoscopy, Ligation

EP-1105 [Neuroanatomy » Cranial]

360-Degree Three-Dimension Microneurosurgical Analysis of Surgical Approaches to the Tuberculum Sellae

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Background: The pituitary fossa occupies the central part of the sphenoid bone and is bounded anteriorly by the tuberculum sellae and posteriorly by the dorsum sellae (1). This region is surrounded by a high concentration of neurovascular structures. There are several surgical approaches for treating lesions which arise in the tuberculum sellae. (2) The goal of the present study is to analyze and compare surgical approaches to the tuberculum sellae and discuss

relative advantages among the microsurgical and endoscopic approaches.

Method: The microscopic and endoscopic approach and its variations were performed on 5 cadaveric heads (10 sides) injected with colored latex. A scoring system was used to assess surgical exposure of the tuberculum sellae and the associated anatomy from different surgical perspectives. Each surgical area was explored by multiple surgeons using both microsurgical and endoscopic approaches, and the degree of exposure of the important surgical landmarks and surgical maneuverability was evaluated.

Results: Our study provided a 360-degree three-dimensional view of the surgical anatomy of the tuberculum sellae as seen through microscopic and endoscopic perspective. The anatomical relations was studied and discussed in detail.

Conclusion: A clear understanding of the anatomy of the tuberculum sellae and their surrounding structures are essential in understand complex anatomy and in the planning and execution of the various microsurgical approaches.

Keywords: Tuberculum sellae, Neurosurgical approaches, Microneuroanatomy

EP-1106 [Neuroanatomy » Cranial]

Unravelling of the Effect of Taste Buds of Tongue on Blood Glucose Level Regulation in Rats: Experimental Study

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Background: Taste buds is known as important digestive glands stimulatory agents following eating. Although literatures informed that taste sensation stimulate insuline secretion via facial-vagal nerve interactions in the brainstem, there is not enough information how taste buds regulate blood glucose level. Therefore, we aimed to investigate if there is any relationship between the taste buds numbers and blood glucose levels.

Method: This study was conducted on 30 rats. All of them had been used as baseline control group. Blood glucose levels of all animals were determined twice a day/for two days. If blood glucose levels of animals > 125mg/dl accepted as normal (G-I; n=18); > 150mg/dl accepted as hyperglycemic (G-II; n=5) and <100mg/dl accepted as hypoglycemic (G-III; n=7). Then, all animals sacrificed under general anesthesia following intra cardiac formalin injection. Their taste buds of tongues were examined bilaterally and their numbers were estimated by Stereological methods. Taste buds numbers and blood glucose levels were compared with Mann-Whitney U test. p< 0.005 values were considered as significant.

Results: The mean normal blood glucose level of all animals was 113±12mg/dl; the mean taste buds numbers of per cm³ was 195±45 in G-I; 145±19mg/dl and 103±21 in G-II and 91±15mg/dl and 237±50 in G-III. P values between that groups were found as follows: p<0.001 of G-II/G-I; p<0.005 of G-III/G-I and p<0.0001 of G-III/G-II.

Conclusion: The taste buds numbers of tongue may have critical

roles on the regulation of blood glucose levels by way of chorda tympani-vagus nerves and pancreas interactions.

Keywords: Taste buds, Tongue, Blood glucose level

EP-1107 [Neuroanatomy » Cranial]

Approach and Surgical Strategy of a Frontal Sinus Osteoma with Intraorbital Extension

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Osteomas of the intra-orbital para-nasal sinuses are rare benign tumors of slow evolution and may be responsible for ophthalmological complications. Their treatment is only surgical. We report a medical observation of an 18-year-old woman. The tumor was revealed by progressive exophthalmos associated with headache. The ophthalmological examination showed a hard mass sitting at the superior-internal angle of the right eye. The neuro radiological (TDM and IRM) confirmed the diagnosis of osteoma of the frontal sinus with intraorbital extension. The unterberger bicoronal pathway and the surgical approach through the right orbital arch permitted the removal of a sinus osteoma that compresses the right eye's oblique upper muscle. The liberation of the oblique upper muscle and his pulley was very laborious. The procedure will be described. The clinical and radiological evolution was very favourable. The frontal sinus osteoma with intraorbital extension is a benign bone neof ormation. The approach and surgical strategy depend on the exact location of the osteoma and resounding in the intraorbital content.

Keywords: Osteoma, Frontal sinus, Pulley, Oblique upper muscle

EP-1108 [Neuroanatomy » Cranial]

Endoscopic Transchoroidal Fissure Approach: How I Do It?

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The third ventricle (V3) is one of the most difficult areas in the brain to access surgically. It is almost impossible to reach its cavity without incising some neural and vascular structures. We'll describe in this presentation the endoscopic transchoroidal fissure (ETF) approach. The ETF approach is a purely endoscopic technique passing through the choroidal fissure located between the fornix and the thalamus to access the pineal and posterior fossa regions which are invisible through the foramen of Monro. The use of this approach avoids much neurological morbidity (memory loss, psychiatric disorders) due, respectively, to the damage to the body of the fornix and the thalamus. Using this approach, the massa intermedia is well seen. This marks the boundary between the processes of the anterior part of the V3 which must be approached by the foramen of Monro and those involved the pineal region and the fourth ventricle or brainstem by the choroidal fissure approach. It is a safe and effective route to approach the V3 lesions with less morbidity and mortality. The purely ETF approach constitutes a better alternative for reaching the pineal and posterior fossa regions. In this way, it is possible at one step to treat any associated hydrocephalus, study the CSF and

obtain a histological diagnosis. Thus, ventriculo-peritoneal shunts with all their complications are avoided; imprecise stereotactic biopsy become unnecessary and potentially unnecessary large open surgery is rendered irrelevant.

Keywords: Choroidal fissure, Intraventricular tumors, Neuroendoscopy, Pineal region, Posterior fossa

EP-1109 [Neuroanatomy » Cranial]

Anatomic and Clinical Findings of Modified Orbitozygomatic Craniotomy

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Background: The surgical technique of orbitozygomatic craniotomy reported by Zabramski, et al. is an excellent procedure, facilitating wide surgical exposure, easy orbital reconstruction, and a satisfactory postsurgical aesthetic outcome; however, it is anatomically complicated and technically difficult. The authors introduce a simplified technique of Zabramski's orbitozygomatic craniotomy and present the anatomic and clinical findings.

Method: The orbitozygomatic craniotomy was performed on 20 sides of 11 cadaveric heads, in which the cut between the inferior orbital fissure (IOF) and superior orbital fissure (SOF) was modified and simplified, and the shortest distance between them was measured. This technique was applied to 13 clinical cases, and craniotomy-associated aesthetic and functional complications were evaluated.

Results: The average of the shortest distance from IOF to SOF was 21.3 mm (range, 19 - 23 mm) on the 20 sides of the 11 cadaver heads. Orbitozygomatic craniotomy could be achieved in a short time while preserving the structure of the orbital wall in all 13 clinical cases. A hollow at the temple was noted in one patient, cerebrospinal fluid leak in two, and transient facial pain in one; however, no other craniotomy-associated aesthetic or functional complications including enophthalmos were found in any of the 13 patients.

Conclusion: With this modified technique, Zabramski's ideal orbitozygomatic craniotomy could be achieved easily with only minimal complications while realizing all advantages of the technique.

Keywords: Cadaveric dissection, Inferior orbital fissure, Orbitozygomatic approach, Superior orbital fissure

EP-1110 [Neuroanatomy » Cranial]

The Posterior Wall of the Cavernous Sinus: Microsurgical Anatomy and Surgical Significance

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Background: Transcavernous surgical corridors are a valid

alternative to lateral approaches to the petroclival area between the posterior clinoid and jugular processes. Limited information is available about the complex anatomy of the posterior wall of the cavernous sinus. We describe in detail the microsurgical anatomy of posterior wall of the cavernous sinus and its anatomical relationships.

Method: Microscopic anatomical dissection of the cavernous sinus was performed on 5 cadaveric specimens. The four borders of the posterior wall of the cavernous sinus were identified and defined with respect to surrounding anatomical relationships.

Results: The posterior wall of the cavernous sinus is a layer of dura which separates the cavernous sinus content from the posterior fossa and is bounded laterally by the medial part of Meckel's cave and medially by the lateral aspect of the sphenoid bone. The complex system of posterior petroclinoid ligaments and the temporal lobe dura contribute to the superior border. The inferior border was identified between foramen ovale, CN V3 just medial to the foramen lacerum, and the lateral aspect of the sphenoid bone. The posterior wall of the cavernous sinus is traversed by several neurovascular structures including CN III and IV superiorly, CN VI superolaterally in Dorello's canal, and the dorsal meningeal and Bernasconi and Cassinari arteries in their courses to the clival dura posteriorly.

Conclusion: A clear understanding of the anatomy of the posterior wall of cavernous sinus and its complex anatomical architecture is essential to define optimal transcavernous surgical corridors to the middle clival area.

Keywords: Cavernous sinus, Anatomy, Transcavernous

EP-1111 [Nursing » Nursing]

Assessment of Quality of Life by Walking Test and Depression Scale of the Elderly in Their Nursing Home

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Background: Ageing is a process which affects many systems in the organism. A decrease is observed in physical fitness and endurance developing as a result of these. The benefits of physical activities in the elderly are said to be ensuring good health, securing functional independence and improving the quality of life. The purpose of this study is to determine the demographic characteristics of elderly people in the rest homes and to examine the relationship between depression and functional capacity. Comorbid depression is highly prevalent in geriatric patients and associated with functional loss, frequent hospital re-admissions, and a higher mortality rate. Depression is common in individuals with mild cognitive impairment (MCI) and may confer a higher likelihood of progression to dementia. Prevalence estimates of depression in those with MCI are required to guide both clinical decisions and public health policy, but published results are variable and lack precision.

Method: Face-to-face interview with a physiotherapist in geriatrics aged 65 years and over SF-36 short form inquiry, functional examination and Geriatric Depression Scale (GDS) were used to assess depression. A total of 60 elderly individuals participated in the study; 43 male, 17 female.

Results: The SF-36 total scores and subscores were higher in Group 1 than in Group 2, but only the SF-36 total score and the difference between Role Strength-Physical, Vitality and Mental Health scores were statistically significant ($p < 0,05$).

Conclusion: Physical activity interventions should be designed to promote collaborative relationships between interventionists and participants. Older adults bring with them symptoms, emotions, motives, and beliefs that are as important to adherence and to the outcomes of interventions as the physical training regimen itself. Furthermore, from the perspective of both behavior change and physical training, the design of physical activity programs for older adults should pay close attention to intended objectives. The prevalence of depression in patients with MCI is high. A contributor to heterogeneity in the reported literature is the source of the sample, with greater depression burden prevalent in clinic-based samples.

Keywords: Depression, Scale, Walking test, Nursing

EP-1112 [Nursing » Nursing]

Impact of Self Learning Package on Nurses' Performance about Care of Head Injury Child

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Background: Traumatic brain injury is a leading cause of deaths worldwide in children. Background: to assess the impact of self learning package regarding care of head injury children on nurses' knowledge and performance.

Method: Quasi experimental design was used. The study was conducted in the Neurosurgery, Emergency Departments and Pediatric ICU in Benha University Hospital. Sample: All nurses working in the above mentioned settings (100 nurses) were included in the study. Tools: An interview questionnaire, observational checklist and protocol based program were provided based on deficit knowledge and practices.

Results: Regarding nurses' knowledge, \geq half of nurses didn't know nursing management of head injury in preprogram phase. On follow up phase half of studied nurses had adequate knowledge (due to utilization of handouts and provided lectures). Regarding nurses' practices; we have improvement in post program and follow up phases due to effect of this educational program.

Conclusion: The implementation of self-learning package improves nurse's knowledge and performance regarding care of head injury in children. Nurses had better knowledge and practices about head injury in children on posttest and follow up test rather than on pretest. Take Home Message: 1. The study reinforce the need for sustained education and training program for continuous updating nurses knowledge and performance about head injured children. 2. Orientation programs for newly recruited nurses who work in neurosurgery, emergency departments, pediatric ICU are recommended. 3. Future researches should be applied utilizing different methods of education and attitude enhancement techniques

Keywords: Head injury, Nursing care, Self learning program

EP-1113 [Nursing » Nursing]

Applications of Nurses Who Working at Intensive Care Unit of Neurosurgery and Neurology that Related to Prevention of Nosocomial Infections

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Background: The study has been planned and held with the aim of determining the applications of nurses who working at Intensive Care Unit (ICU) that leading to prevention of Nosocomial Infections.

Method: The sample of the descriptively designed study consists of 100 nurses who are selected by random sampling and who have worked at ICU in two governmental hospitals which both are located in Istanbul. In this study data collection tool obtained from the questionnaire which was prepared utilizing the literature.

Results: The average age of the nurses was $29,51 \pm 4,76$, 16% of them are health vocational high school graduated, 14% are collage graduated, 62% are nursing faculty graduated and 8% are done their masters in nursing; 80% of nurses are working at nightly shifts, while 20% of them are working at daytime shifts. 25% of the nurse who took part in our questionnaire were working at ICU for less than one year, 47% of them were working for 1-5 years periods at ICU, while 28% were working at ICU for more than 5 years. 92% of the nurses were participated in a training program to prevent hospital-acquired infections, while 8% of them were not participated to any such program.

Conclusion: Practical education was the only factor which play the role in reducing ICU Nosocomial infections. There were no statistically significant differences between nurses according to their worked department; their educational levels, ages, working duration and working shift ($p > 0,05$).

Keywords: Nurse, Nosocomial infections, Hospital-acquired infections, Education, Universal precautions, Catheter

EP-1114 [Neurotraumatology and Neuro Critical Care » Others]

Craniotomy Versus Craniectomy in Acute Traumatic Subdural Hematoma: Predictors, Outcomes and Survival Analysis

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Aim: To determine the outcomes and predictors of survival after acute traumatic subdural hematoma following craniotomy/decompressive craniectomy.

Method: A Retrospective cohort was done over 16 years (2000-2015) including all adult patients (age > 17 years) who sustained acute traumatic brain injury resulting in subdural Hematoma (ASDH) requiring surgery (Craniotomy vs DC). Patients with

other significant traumatic brain injury (contusions, extradural hematoma), spontaneous bleed, systemic injuries were excluded. Data analysis was done SPSS. $P < 0.05$ were considered significant.

Results: A total of 165 patients were included with the majority were male (87.9%). Patients who underwent a craniotomy were significantly older than patients who underwent a craniectomy. There were also significant differences in the ER to OR shifting time, Marshal Grade, total time for surgery, ICU stay, SCU stay and post-operative GCS. Furthermore, when a comparison was made between type of surgery and mortality, there was no relation between mortality and type of surgery performed ($p = 0.138$). Overall survival rate was 75.2%, which was only found to be significant for age and presenting GCS when divided categorically based on Kaplan meier survival analysis. Patient's age, ER to OR interval and blood loss were found to be statistically significant independent factors on multivariate analysis.

Conclusion: The study suggests younger age, less ER to OR interval and less blood in a setting of acute SDH are associated with improved outcomes. A lower presenting and discharging gcs is associated with poor prognosis. The type of surgery does not affect survival in patients with Acute SDH.

Keywords: Acute traumatic subdural hematoma, Craniotomy, Craniectomy, Outcomes, Survival

EP-1115 [Pediatric Neurosurgery » Others]

Outcome and Patterns of Traumatic Brain Injury in Paediatric Population of a Developing Country Secondary to TV-Trolley Tip Over

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Background: TV trolley tip over incidences are common, can cause significant morbidity and mortality in children. This study aimed at analyzing the pattern and outcomes of head injury resulting from TV trolley tipover.

Method: This was a medical chart review of children with TV trolley tipover head injury from January 2009 to October 2015. We collected data on demographics, mechanism of injury, clinical and radiological features of injury and its outcomes. Outcomes of head injury were measured through Glasgow Outcome Scale (GOS) at 6 months. A descriptive analysis was carried out using SPSS-19.

Results: 21 children were included in the study. 15 children were male with a mean age of 29.6 months. Most of the children ($n = 16$) were aged between 12 to 35 months. The median GCS score on admission was 15. The median Rotterdam score for the patients was 2.0. The common symptoms on admission were vomiting, irritability, scalp laceration and bruises. The median length of stay was 3 days. Skull bone fractures were present in 11 children. Other CT findings included contusions, extradural and subdural hematomas, intraventricular hemorrhage and pneumocranium. Surgical intervention was required in 4 cases. Although most of the patients made good recovery ($GOS = 5$), 1 patient had develop mild disability and another died in hospital.

Conclusion: TV trolley tipover is mostly common in toddlers, and can lead to significant head injury and mortality. This can be avoided by parental supervision and adjustments in the household.

Keywords: Television, Tipover, Head injury, Home injury, Pediatric trauma

EP-1116 [Neurotraumatology and Neuro Critical Care » Basic Science]

To Study the Acute Phase Serum Biomarkers in Patients with Mild Traumatic Brain Injury (mTBI) and Correlate with Short Term Cognitive Deficits

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Aim: To study the acute phase serum biomarkers in patients with mild traumatic brain injury (mTBI) and correlate with short term cognitive deficits.

Method: Tertiary care center for Neurotrauma. Participants: Patients with mTBI ($n = 20$) and age, gender and education status matched healthy controls ($n = 20$). This is a prospective longitudinal observational study. Ubiquitin C Terminal Hydrolase (UCH-L1), S100B and Neuropsychological tests were performed.

Results: There was marginally increase in the serum S100B and UCH-L1 levels in patients with mTBI. Patients with mTBI had significant cognitive deficits at three months after injury, suggestive of involvement of diffuse areas of brain, particularly premotor, prefrontal and medial inferior frontal lobes and basitemporal region. The correlation of biomarkers with cognitive deficits in mild head injury were found in following domains: working memory, verbal learning, verbal fluency, and visual memory in short term.

Conclusion: The serum biomarkers may differentiate patients with mTBI from normals, and have correlation with selective domains of neuropsychological outcome.

Keywords: Post concussion syndrome (PCS), Ubiquitin C terminal hydrolase-L1, S100B, Neuropsychological outcome, Serum biomarkers, Traumatic brain injury, Mild traumatic brain injury

EP-1117 [Spine and Peripheral Nerve » Spinal Tumors]

Pure Ventral Midline Intradural Extramedullary Tumors - Case Discussion and Management Pearls

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Pure ventral Midline Intradural extramedullary tumor is a rare entity. We present a series of 3 cases, two of which are giant tumors. Giant midline tumors are extremely rare and there is limited literature about such tumors. Two of our cases involve the cervical dorsal region and one is of dorso-lumbar area. We discuss the presentation, of these tumors as well as management strategy adopted at our centre. Surgical technique for successful removal of pure ventral midline tumors would be presented at length. Intraoperative neuromonitoring remains a helpful tool for prevention of complications. Long term follow up is discussed. Literature review is undertaken for origin of such tumors, natural history and their prognosis.

Keywords: Pure, Ventral, Midline, Intradural, Spinal, Tumors

EP-1118 [Miscellaneous » Others]

ICP Monitoring After ETV: A Prospective Study to Predict ETV Outcomes

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Background: Endoscopic third ventriculostomy is a commonly used modality for the treatment of hydrocephalus. The success rate is variable and ranges from 50% to 95%. The most appropriate method to predict outcomes of ETV in postoperative period is still a matter of debate.

Method: We monitored the ICP of 41 patients in postoperative period to better understand CSF hydrodynamics, and to evaluate for correlation between ICP readings with the final outcomes. ICP values were recorded every 30 minutes for 3 days, 48 ICP values obtained each day was averaged to obtain a daily average value.

Results: Four ICP trends were derived from the linear charts using the daily average values from day 1 to day 3 and were correlated with ETV outcomes. "Progressive decrease" trend was seen in 14 patients of which 12 had successful outcome. "Stable" trend was seen in 11 patients of which 9 had successful outcome. "Progressive increase" trend was seen in 12 patients, of which only 1 had successful outcome. On further analysis, statistical significant association between the "progressive decrease" and "stable" trend with ETV success was seen, where as statistical significant association between "progressive increase" and ETV failure was seen.

Conclusion: ICP monitoring can be a useful tool in predicting the outcome, and should be considered in all or at least those patients suspected to have unpredictable course after ETV. However, multicentric study with increased sample size and longer duration of follow up is necessary to critically evaluate the efficacy of ICP monitoring in predicting the outcomes of ETV.

Keywords: ETV, ICP monitoring, ICP trends

EP-1119 [Miscellaneous » Epidemiology]

Post-Concussion Syndrome Disorders in Professional Athletes

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Post concussion syndrome is a situation that needs appropriate approach and management, specially in professional athletes. Aim of this study was to evaluate post concussion syndrome disorders in professional athletes. Six men-60% and 4 women -40% (range 18-38 years and mean age 29) with post concussion syndrome disorders. Evaluation of 10 amateur athletes was performed:

- 3 basketball players (30%)
- 2 football (soccer) players (20%)
- 1 volleyball players (10%)
- 1 boxer athlete (10%)
- 1 swimmer (10%)
- 1 tennis athlete (10%)
- 1 long distance runner (10%)

Results The most common disturbances were:

- headaches and dizziness in 4 patients-40%,
- fatigue in 2-20%,
- anxiety in 2-20%,
- insomnia in 1,10%,
- loss of memory in 1, 10%.

We suggest in all of them (10,100%), cognitive therapy and appropriate medication, under neurological and psychiatric surveillance. 9 of them- 90%-returned with safe results in the physical activity after 3 weeks period.

It seems that cognitive-behavioural therapy and medication could be helpful in these situations. Post concussion syndrome remains a post traumatic condition that needs accurate evaluation and approach.

Keywords: Concussion, Syndrome, Disorders, Professional athletes

EP-1120 [Stereotactic and Functional Neurosurgery » Epilepsy]

Brain-to-Text Study Through SEEG Electrodes in the Patients with Epilepsy

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Background: Patients who could not talk and move their hands need to communicate with others. There are different techniques for them to communicate. sEEG data could be a good way for them, printing their speech on to the computer screen without hand and talking.

Method: Sixty-nine patients underwent stereo-electro encephalography (sEEG) surgery for locating epileptogenic zone. Each patient had his own depth electrodes location according to his clinical signs, neuroimaging findings and scalp electroencephalography(EEG). Two of them had electrode passed through middle temporal area (MT). Using these two electrodes, we analyzed the high gamma response of motion visual evoked potential (mVEP) through brief motion task. Phonetic features could be decoded from these data, and perceived speech would be reconstructed. The text which they want to spell would be printed on a computer screen in front them through in-line data-analyzing system.

Results: After training 3 hours, the two patients could freely print the Chinese and English characters, for 10 English words and Chinese characters, they could achieve up to 80% of correct words. sEEG had good temporal and spatial advantage, it could be located in human MT cortex accurately and EEG data could be achieved with high gamma response of mVEP. It is helpful for patients to print the speech on the computer not with hand, but with brain and data.

Conclusions: Spoken speech could be recognized from sEEG data, that is used for patients to print the words to the computer screen with brain, not with hand or talk.

Keywords: SEEG, Epilepsy, Communication, Electrodes

EP-1121 [Neurotraumatology and Neuro Critical Care » Others]**Complicated Pachymeningitis of Cerebral Abscess on Neglected Craniocerebral Wound: An Observation**

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Intracranial pachymeningitis (PMIC) correspond to a chronic inflammatory thickening of the dura mater. They are relatively rare, and may be secondary or idiopathic. We report this case of our service with review of the literature. He was 56 years old, diabetic with insulin, he had a history of neglected cranial trauma. He presented confusion, headache, vertigo, a right temporal sequel wound with pus outlet, and monoparesia of the upper left limb. A cerebral CT made, supplemented by sections with injection of contrast medium, found a right temporal bone defect, pneumocephaly, right fronto-temporo-parietal bone thickening, thickening of the dura mater with a right frontal image in cockade and under factorial engagement. Surgical exploration found a cerebral abscess. Pathologic examination found a chronic osteitis and the bacteriological examination found a flora made of staphylococcal coagulase negative, enterobacter cloacae, streptococcus beta hemolytic put under antibiotic therapy. The etiologies in the literature are mainly inflammatory, carcinomatous, tuberculous, traumatic. Treatment should be tailored on a case-by-case basis.

Keywords: Pachymeningitis, Cerebral abscess, Cranial trauma

EP-1122 [Neurovascular Surgery » Endovascular Surgery]**Microembolic Event During Endovascular Coiling for Unruptured Intracranial Aneurysms-Relations with Clopidogrel Resistance**

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Background: As the endovascular technique is developed, its role in the treatment of intracranial aneurysms is gradually increasing. Although many of the advantages of the endovascular coiling is emerging, adverse event should also be taken into account. This study is designed to reveal the relations between PRU(P2Y12 reaction unit) and microembolic event.

Method: We used our neurointerventional database to identify a total of 427 consecutive patients who had presented with a unruptured intracranial aneurysms (UIA) for endovascular treatment between July 2011 and June 2014. All patient underwent Diffusion weighted image (DWI) within 2 days after endovascular coiling. Diffusion positive lesions were counted in each patients. During the study period, our policy on antiplatelet agent premedication had changed. By the end of June 2013, when resistance was confirmed by P2Y12 inhibition assay, triple antiplatelet therapy with cilostazol was performed (period I) and then only dual antiplatelet therapy without P2Y12 inhibition assay (period II).

Results: There was no significant relations between the PRU value and microembolic event, analyzing cufoff PRU value was 240.(p=.073). However, some statistically significant results were obtained when the PRU value was re-analyzed with categorical unit and continuous variable. Also there was relations between PRU value and the number of microembolic lesions (p=.010).

Conclusion: Antiplatelet premedication was performed to reduce the risk of embolic infarction and adjuvant cilostazol medication was administered to patients whose resistance was confirmed by the p2y12 assay However, the clinical efficacy of cilostazol may be limited due to the inadequate clinical outcome of the cutoff value of resistance.

Keywords: Microembolic, Infarction, Endovascular, Clopidogrel resistance, p2y12, Unruptured aneurysm

EP-1123 [Neurovascular Surgery » Endovascular Surgery]**Trigemino-cardiac Reflex During the Endovascular Treatment of Intracranial Vascular Disease**

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Trigemino-cardiac reflex (TCR) described as physiological response features sinus bradycardia, hypotension, apnea, and gastric hypermotility that results from stimulation of any of sensory branches of trigeminal nerve or trigeminal ganglion. TCR rarely reported with endovascular Onyx embolization of dural Arteriovenous fistulas. Recently, we experienced two cases of TCR during neurovascular interventions.

Case 1. A 48-year-old man presented persistent diplopia after car accident. He was diagnosed with left carotid -cavernous sinus fistula(CCF). Transarterial embolization of fistula with Onyx was performed. Under general anesthesia, microcatheter introduced into the fistula through arterial foramen rotundum. Immediately after injection of Onyx, sudden bradycardia occurred, followed by asystole and sudden drop in blood pressured. It resolved with intravenous administration of 20mg ephedrine and 0.5 mg atropine.

Case 2. A 42-year-old man admitted for further treatment of residual brain AVM. A microcatheter advanced into one of main left MCA feeders. When passed into posterior temporal feeder, experienced some resistance mainly caused by marked tortuosity. When applied some tension to microcatheter by pushing it, patient developed sudden bradycardia and subsequent asystole. The tension immediately released and heart rate returned to baseline. After experiencing the bradycardia and asystole, terminated the procedure and patient recovered uneventfully. TCR can lead significant hemodynamic changes during endovascular onyx embolization of vascular malformations involving receptive field of trigeminal nerve. Therefore, the neurointerventionists should be made aware of treatment approach prior to intervention and appropriate precautions taken. Rapid recognition and treatment of this phenomenon leads to a favorable neurological outcome, and allows for successful endovascular embolization

Keywords: Trigemino cardiac reflex, Endovascular, Arteriovenous malformation, Carotid-cavernous fistula

