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Case Report

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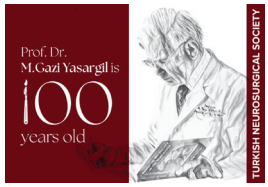

Tuberculum Sella Meningioma Compressing Anterior Cerebral Artery Causing Optic Nerve Symptoms- A Case Report

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ABSTRACT

Blindness due to blood vessels being compressed by tumors around optical chiasma has rarely been reported in the literature. We hereby report a rare circumstance where visual impairment occurred in a patient diagnosed with tuberculum sellae meningioma caused by optic nerve compression from the anterior cerebral artery. In this manuscript, we discuss the perioperative tests, intraoperative considerations, and anesthetic practices, all of which work in cohesion to achieve the best possible outcome for the patient. The learning impetus of this case report is to promote this knowledge in regular clinical practice in order to prevent vision loss at the earliest possible time by evaluating the optical pathway clinically and radiographically.

KEYWORDS: Meningioma, Optic nerve, Anterior cerebral artery, Blindness

INTRODUCTION

One of the most common symptoms of tuberculum sellae meningiomas is progressive visual loss which can be in one eye or both eyes (1). The growth of parasellar meningiomas in subchiasmal region can lead to compression of the optic nerves. These tumors can even extend to the optic canal (7,8). We report a rare case of visual deterioration in a patient of Tuberculum sellae meningioma caused due to optic nerve compression occurring by the A1 branch of Anterior cerebral artery (ACA).

CASE REPORT

Our patient was a 40 year old female, with no known comorbidities having the complaint of painless progressive diminution of vision of right eye since 2 years alongwith difficulty in seeing laterally from the left eye for last 6 months. Her right eye revealed decreased visual acuity till the point of only able to count fingers close to face, with relative afferent pupilliary defect (RAPD) and a pale disc on fundus examination. The left eye revealed a visual acuity of 6/12, with sluggishly reacting pupil and a normal fundus examination. However, it had a temporal hemifield defect extending to nasal hemifield. The visual field of the right eye could not be assessed. The bulk and tone of the muscles was normal alongwith a power of 5/5 in all the groups. Likewise, the sensations of touch, pain and temperature were normal. The rest of the nervous system examination was normal.

Neuroimaging revealed a well defined heterogeneously enhancing lesion of 2.6 x 2.5 x 2.3 cm dimension in the suprasellar region with an intrasellar extension. It was isointense on T1 and hyperintense on T2 weighted imaging. Superiorly, it extended up till the floor of the third ventricle. The bilateral A1 segments of ACA were stretched out and displaced antero-superiorly by the lesion. Laterally, it abutted both cavernous sinuses without any intra-sinus extension. The optic chiasma and the proximal aspect of both the optic tracts were stretched out superiorly by the lesion.

After uneventful anesthetic induction using thiopentone, fentanyl and vecuronium, the patient was positioned supine at

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an angulation of 20 degrees on the operation table. Her neck was extended and her arms were tucked on sides, keeping in mind the protection of pressure points. Thereafter the eyes were padded. The patient underwent right fronto-temporal craniotomy, orbitotomy, anterior clinoidectomy and optic canal de-roofing via oblique subfrontal approach followed by a Simpsons grade 2 excision of lesion.

It was observed that the right optic nerve was severely compressed by right A1 segment of the ACA. This artery was gently dissected from the optic nerve. There was clear indentation on the optic nerve seen after separating the artery, severely compromising it (Figures 1 and 2). A loading dose of levetiracetam was given after resection of the lesion. The patient was reversed from muscle relaxation and extubated on the operation table. The post-operative tenure was uneventful, and the subsequent CT brain showed good decompression of lesion with absence of operative site hematoma. Intra-operative hemodynamics and ventilation trend revealed a stable anesthetic maintenance on Air-Oxygen-Sevoflurane mixture and volume controlled mechanical ventilation (Figures 3 and 4).

Post-operatively, the projection of light (PL) was negative in right eye, however visual acuity in left eye was 6/12, N12 on Snellen's chart alongwith presence of a dense temporal hemifield scotoma extending infero-nasally. The patient tolerated the procedure well and was discharged in a stable condition 7 days after surgery. There was no improvement in vision at 3 and 6 months after surgery.

The sections of tumor for histopathology examination depicted meningothelial neoplasm composed of neoplastic meningothelial cells arranged in whorls and lobules. These cells exhibited mildly pleomorphic, ovoid vesicular nuclei with occasional mitosis 1-2 per 10 hpf. The stroma showed lymphocytic infiltration and collagen foci, giving the impression of transitional meningioma.

Written informed consents were obtained from the individuals (and/or legal representatives) for the publication of the cases.

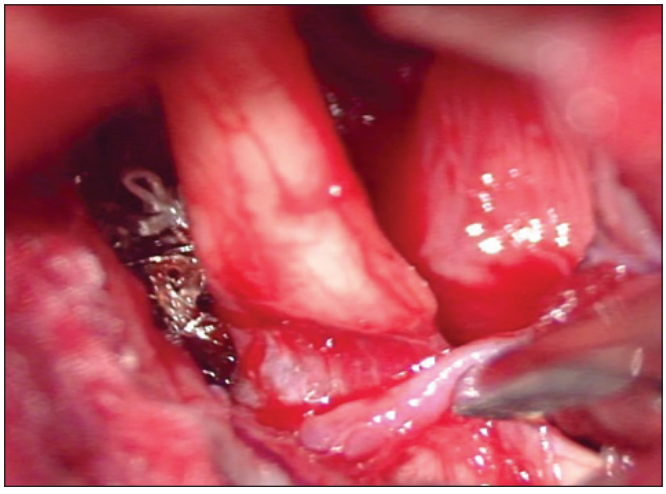

Figure 1: Artery overlying the optic nerve.

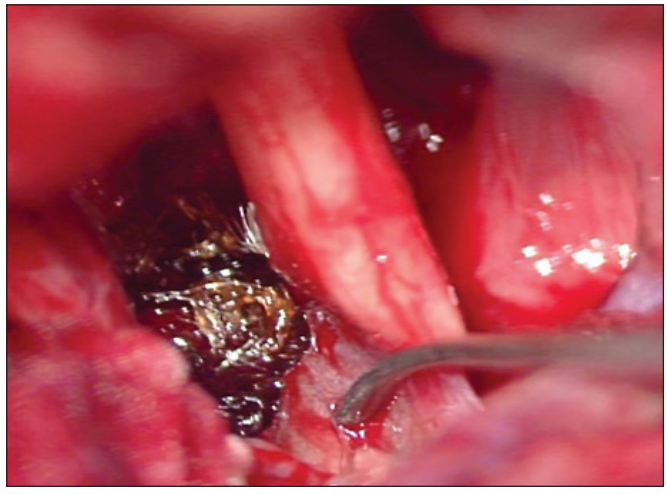

Figure 2: Compression of optic nerve by the artery.

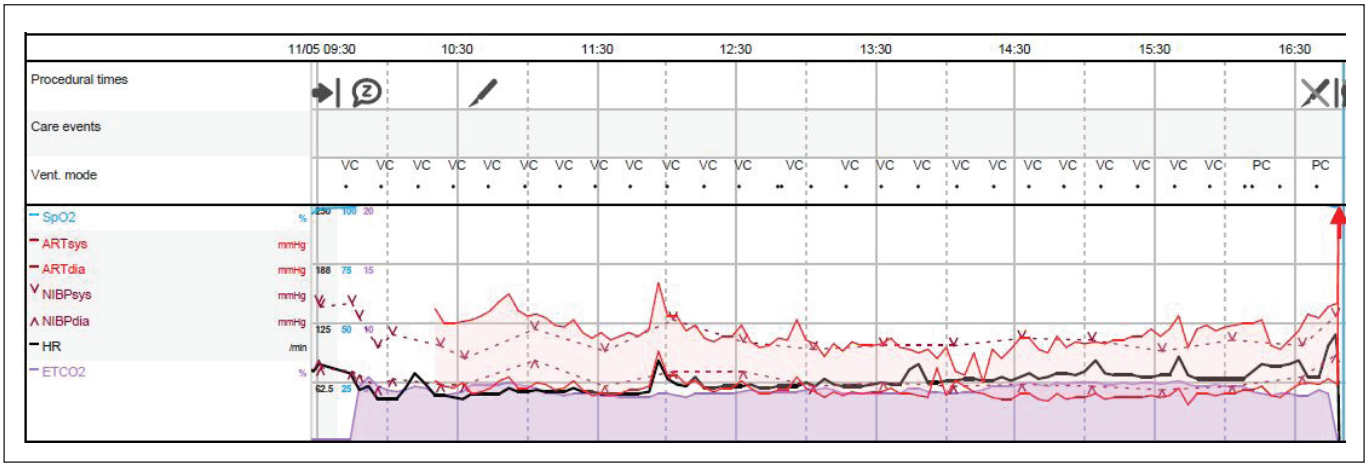

Figure 3: Hemodynamic trend during the surgery.

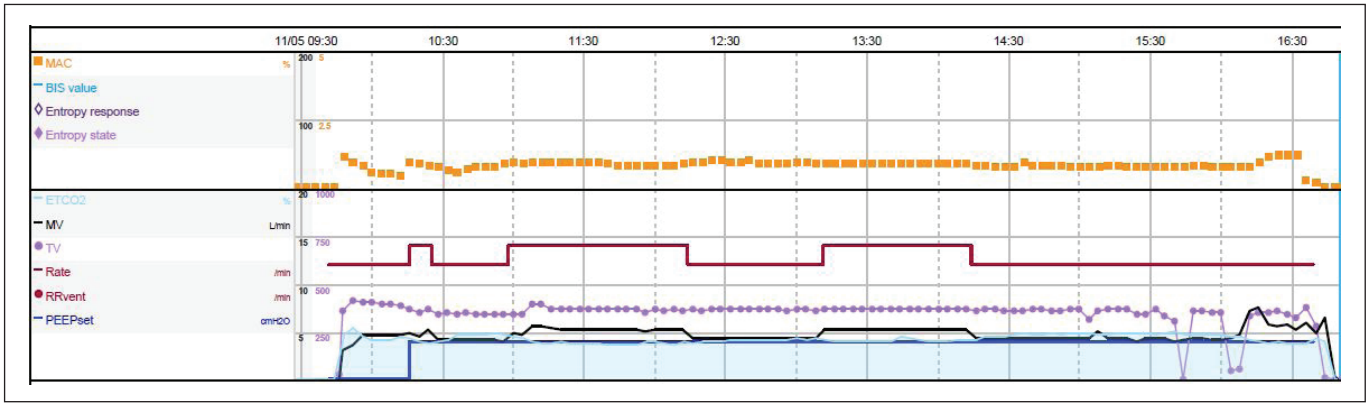

Figure 4: Ventilatory parameter trend during the surgery.

DISCUSSION

Optic nerve strangulation by the A1 segment of the anterior cerebral artery in a patient with tuberculum sellae meningioma is rare occurrence. Visual loss occurred secondary to the mechanical compression of the optic nerve by the tumor.

Levatin described the strangulation of optic tract by anterior cerebral artery in a patient harboring a suprasellar tumor (5). Meningiomas can be associated with vascular malformations and even aneurysms, owing to the change in cerebral hemodynamics around the lesion.

Kumar and Bharadwaj reported aneurysmal rupture of undetected ACA aneurysm during resection of an olfactory groove meningioma in a 52 year old female patient. They monitored the multiwavelength co-oximetry values to manage the hemodynamics in this catastrophic situation and thereby achieve a favorable outcome after this surgery (3).

CONCLUSION

Therefore, one cannot rule out the importance of time tested neuromonitoring techniques like visual evoked potential monitoring (4), cerebral oximetry (10) and non-invasive intracranial pressure assessment techniques like optic nerve sheath diameter assessment (2) and transcranial doppler (6) during neurosurgical practice for such kind of lesions.

Also, the role of dexmeditomidine during anesthetic induction under electroencephalography guidance for neurosurgical procedures is indeed a "*Rising Sun*" for peri-operative neuroscience (9).

Declarations

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Availability of data and materials: The datasets generated and/or analyzed during the current study are available from the corresponding author by reasonable request.

Disclosure: The authors declare no competing interests.

AUTHORSHIP CONTRIBUTION

Study conception and design: KVLNR
Data collection: KVLNR
Analysis and interpretation of results: KKS
Draft manuscript preparation: KKS
Critical revision of the article: DST
Other (study supervision, fundings, materials, etc...): DST
All authors (KVLNR, KKS, DST) reviewed the results and approved the final version of the manuscript.

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