



Treatment Principles for Coccygodynia

Koksigodiniyada Tedavi Prensipleri

Sedat DALBAYRAK¹, Onur YAMAN², Tevfik YILMAZ³, Mesut YILMAZ⁴

¹Neurospinal Academy, Istanbul, Turkey

²Tepecik Education and Training Hospital, Clinic of Neurosurgery, Izmir, Turkey

³Dicle University, School of Medicine, Department of Neurosurgery, Diyarbakir, Turkey

⁴Neurospinal Academy, Istanbul, Turkey

Corresponding Author: Onur YAMAN / E-mail: dronuryaman@yahoo.com

ABSTRACT

AIM: An evaluation of treatment methods and outcomes for coccygodynia cases that do not respond to conservative treatment.

MATERIAL and METHODS: Local anesthetic and steroid injections were applied in 32 coccygodynia cases that did not respond to conservative treatment (average of 15 months). Coccyx excision was performed as surgical treatment in 25 cases that had pain relief after the injections but later re-presented with complaints. The patients' pain levels were assessed with VAS. Postacchini classification was used for patient classification based on plain radiography.

RESULTS: 20 (62%) of the cases (the total including injection and surgery groups) had a trauma history. Majority of the cases treated with local steroid injection included patients with Type I, while the 25 cases that received surgical treatment predominantly included Type II patients. One case had post-operative skin infection, which was treated with antibiotics. It was observed by comparing pre-operative and post-operative pain scores that both methods provided significant pain relief in all patients.

CONCLUSION: While local steroid injection is an effective method of treatment for Type I patients, the coccyx removal is an effective method for controlling the pain in patients with trauma history and in Type II, III and IV patients.

KEYWORDS: Coccygodynia, Treatment, Steroid injection, Coccyx excision

ÖZ

AMAÇ: Konservatif tedaviye yanıt vermeyen koksigodiniya olgularında tedavi yöntemleri ve sonuçlarının değerlendirilmesi.

YÖNTEM ve GEREÇLER: Konservatif tedaviye (ortalama süre: 15 ay) yanıt vermeyen 32 koksigodiniya olgusuna lokal anestezi ve steroid enjeksiyonu uygulandı. Enjeksiyon sonrası ağrıları geçen ancak bir süre sonra yakınmaları tekrar ortaya çıkan 25 olguya cerrahi olarak koksiks eksizyonu uygulandı. Hastaların ağrı düzeyleri VAS ile değerlendirildi. Hastalar direkt grafilerde Postacchini sınıflamasına göre sınıflandırıldı.

BULGULAR: Olguların 20'sinde (%62) (Enjeksiyon ve cerrahi grubu toplamı) travma hikayesi mevcuttu. Lokal steroid enjeksiyonu ile tedavi hastaların büyük kısmı Tip I iken cerrahi olarak tedavi edilen 25 olguda daha çok Tip II hastalar mevcuttu. Cerrahi sonrası cilt enfeksiyonu gelişen bir olguya uygulanan antibiyotik kullanımı ile tedavi sağlandı. Tedavi öncesi ve sonrası ağrı şiddeti karşılaştırıldığında tüm hastalarda, her iki yöntemle de anlamlı olarak ağrının azaldığı gözlemlendi.

SONUÇ: Koksigodiniya tedavisinde Tip I hastalarda lokal steroid enjeksiyonu etkili bir yöntemken; travma hikayesi olan ve tip II, III, IV hastalarda koksiks çıkarılması ağrıyı kontrol etmekte etkin bir yöntemdir.

ANAHTAR SÖZCÜKLER: Koksigodiniya, Tedavi, Steroid enjeksiyonu, Koksiks eksizyonu

INTRODUCTION

Coccygodynia is a term used to describe the pain in and around the coccyx. It is usually observed in women and more likely in the forties (3). The incidence rate of coccygodynia is 3 times higher in obese patients than in those with normal weight. Especially the post-traumatic instability causes hypermobility in the coccyx. And the hypermobility causes chronic inflammatory changes (3). The coccygeal pain is usually increased by sitting and attempting to move. Non-surgical therapy is the gold standard in coccygodynia treatment. Principal methods of pain reduction include analgesic use, limitation of sitting, use of ring shaped pillow and physiotherapy. Effective pain relief can be achieved

with injection of steroid and long acting local anesthetic combination (1). Surgical removal of the coccyx is required in patients that do not respond to conservative treatment and attempts of pain reduction with local steroid injection.

This study aims at evaluating the treatment methods and outcomes of cases treated for coccygodynia.

MATERIAL and METHODS

The study includes 32 cases of coccygodynia that did not respond to conservative treatment. Detailed clinical history was taken for all patients. Detailed questions were asked to discover any past trauma and childbirth incidents. Other factors in the anal region such as fissure and haemorrhoid

were excluded by rectal examination supplemental to the neurological examination. Two-directional lumbosacral vertebral and coccyx x-rays were taken. MRI was used for evaluating the lumbosacral region in order to rule out the underlying pathology. The patients were grouped according to the Postacchini and Massobrio classification (7). This method measures the angle between the coccygeal region and proximal sacrococcygeal region distal to the painful joint. According to this measurement patients with no angulation were classified as Type 1, those with sharper forward curvature and angulation less than 90 degrees as Type 2, those with angulation of 90 degrees as Type 3 and those subluxated at the sacrococcygeal or intercoccygeal joint and angulation exceeding 90 degrees as Type 4 (7) (Table I). Pain levels and life quality index were assessed by VAS.

Surgical Procedure

The patients were placed on the operating table in the prone position under spinal anaesthesia. Hips and knees were fixed in semiflexion by moving the legs away as far as possible. An 8 to 10 cm longitudinal linear skin incision was made to dissect the skin and the subcutaneous tissue. Once the coccyx was exposed, subperiosteal dissection was made to reach the lateral part of the coccyx, and it was disarticulated from the sacrococcygeal joint by using a Kerrison rongeur. Rectal injury was avoided by going from distal to the anterior part of the coccyx. The coccyx was detached from the soft tissue by blunt dissection. Complete coccyx removal was performed distally by dissecting the anococcygeal ligament. The distal tip of the sacrum was filed. Layers were closed appropriately with placement of a Hemovac drain. The patients received 48-hour antibiotherapy after the surgery (cefazolin 2gr/day).

RESULTS

Out of 32 patients, 24 were female (75%) and 8 (25%) were male. The mean age was 34 (27-56). Pain relief could be achieved in 7 patients with the use of steroid and long acting local anesthetic injections. Average pre-injection VAS score was 7.2, whereas the post-injection VAS score was 1.2. The mean age in this patient group was 34 (ages varying between 27 and 45) and one but all patients were women. 4 patients had pregnancy and childbirth history, while 2 patients had trauma history. According to Postacchini classification, one patient was classified as Type II (15%), while the others were classified as Type I (7 patients) (85%) (Table II).

Out of 25 patients in the group that was non-responsive to steroid and local anesthetic injections, 18 were female (72%)

and 7 were male (28%). The mean age was recorded as 38.5 (ages varying between 29 and 56). 18 patients (72%) had trauma history. The average pre-operative VAS score was 8.32, while the post-operative VAS score was 1.40. According to Postacchini classification, 5 patients were Type I (20%), 16 were Type II (64%), 3 were Type III (12%) and 1 was Type 4 (4%) (Table II).

DISCUSSION

The etiology of coccygodynia has not been clearly explained due to the complex anatomy of the sacral region. Coccygodynia usually occurs after trauma. It occurs after falling in the sitting position or on narrow objects that will cause direct impact to the coccyx. Childbirth, anal intercourse or neoplasm involving primary or secondary coccyx may lead to coccygodynia. Coccygodynia may also occur due to infection or inflammation that cause irritation of the pelvic structures, or involvement of the sacrum, sacral roots or parts of lumbosacral plexus as first symptoms of disc herniation. Patients with no known pathology are classified as idiopathic.

Especially the post-traumatic instability causes hypermobility in the coccyx. And the hypermobility causes chronic inflammatory changes (3). Synovial arthritis develops at the sacrococcygeal joint. The coccygeal pain usually occurs during sitting and the attempt to move, while it is relieved by rest. One must be very careful about lower back and coccygeal pain that is not relieved but increased by a night full of rest. Malignity should be considered when there is night pain (8). Pathology of the anus such as haemorrhoid and fissure must be excluded by performing rectal touch during examination, and the prostate must be examined for malignity (8).

The coccyx demonstrates a coccygeal pivot of 5 to 25 degrees with sitting and returning to the normal position with standing. Instead of stable x-rays, dynamic plain x-rays taken at sitting or standing position will have 70% contribution to diagnosing the coccygodynia (3). Postacchini et al. used lateral plain x-rays of the sacrococcygeal region for the classification of coccygodynia (7) (Table I) (Figures 1A-D,2A,B,-3A-F). This method measures the angle between the coccygeal region and proximal sacrococcygeal region distal to the painful joint. According to this measurement patients with no angulation were classified as Type 1, those with sharper forward curvature and angulation less than 90 degrees as Type 2, those with angulation of 90 degrees as Type 3 and those subluxated at the sacrococcygeal or intercoccygeal joint and angulation exceeding 90 degrees as Type 4 (Figures 1A-D,2A,B,-3A-F).

Table I: Postacchini Classification and Types Based on Angulation at the Sacrococcygeal Joint

Types	Evaluation
Type I	Patients with forward curvature and absence of angulation
Type II	Patients with sharper forward curvature and angulation less than 90 degrees
Type III	Patients with angulation of 90 degrees
Type IV	Subluxation or angulation exceeding 90 degrees at the sacrococcygeal joint

Severity of the pain increases from Type I to Type IV (7). In our series, severity of the pain usually increased with higher angulation. Magnetic Resonance (MR) and technetium Tc-99m bone scan help to localize the inflammation that occurs due to coccygeal hypermobility (3). They are also required for excluding any coccygeal pathology that causes pain (2).

Non-surgical therapy is the gold standard in coccygodynia treatment. Principal methods of pain reduction include analgesic use, limitation of sitting, use of ring shaped pillow and physiotherapy (3). Levator ani massage and stretch are reported as effective methods of pain relief (5). Rectal massage is reported to achieve pain relief by stretching the

muscles and connective tissue attached to the coccyx and relieving the spasm (6).

Pain relief can be achieved with conservative treatment in one forth of the patient population. Success rate is 43% in a coccyx with normal movement capability, while it declines to 16% in an immobile coccyx. Resting, sitting on ring-shaped pillows and NSAID drugs must be tried for 2 months at the initial stage of treatment. Local steroid injection must be tried for persistent pain despite conservative treatment. Steroid (40 mg methylprednisolone) and long-acting local anesthetic (10 ml 0.25% bupivacaine) combination is reported to help pain relief. Wray et al. reported a success rate of 85% for injection and manipulation in 120 patients (11).

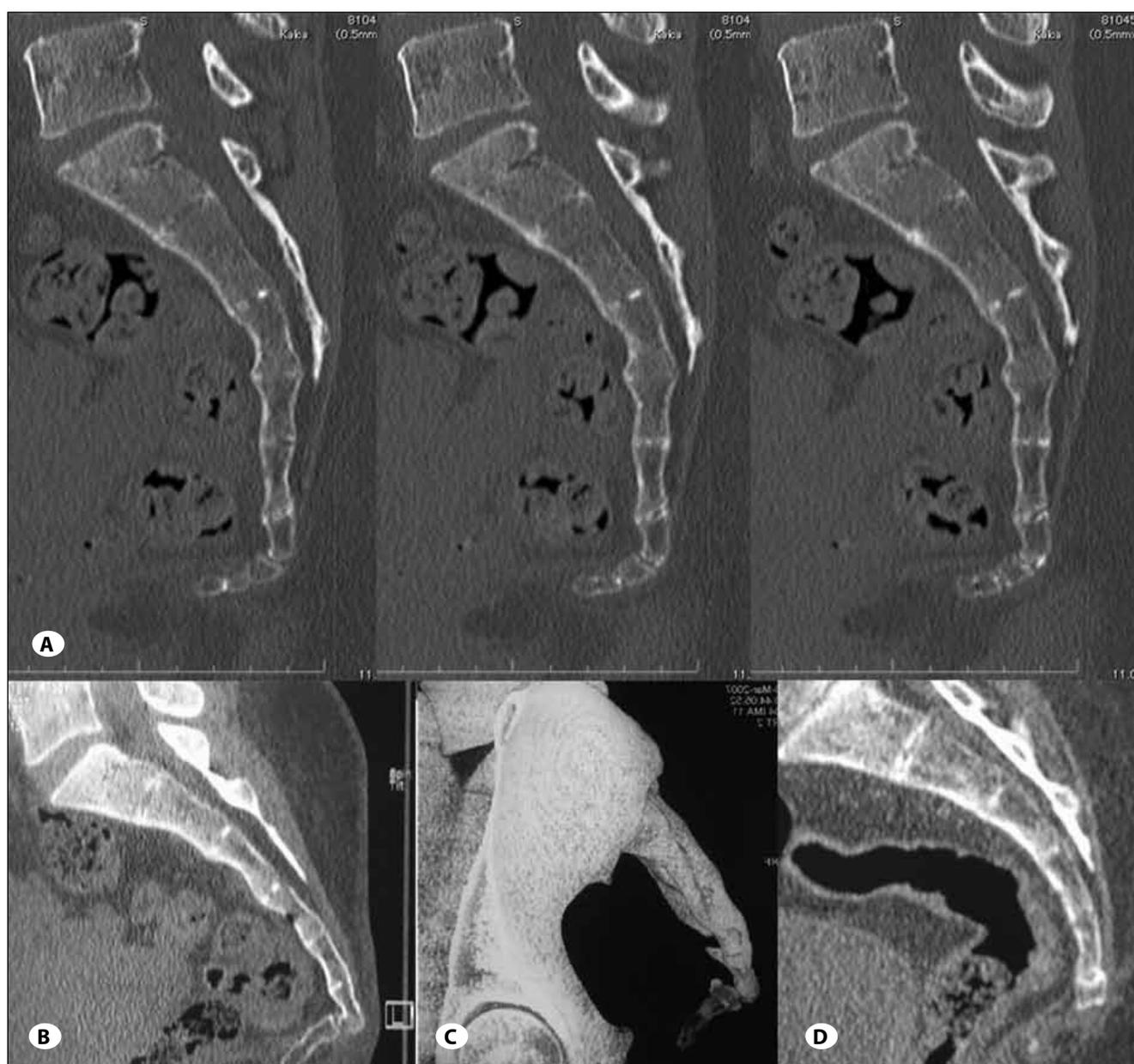


Figure 1: A, B) Preoperative sagittal CT images of a Postacchini Type III case, C) Preoperative 3D CT image. D) Postoperative sagittal CT image of the case.

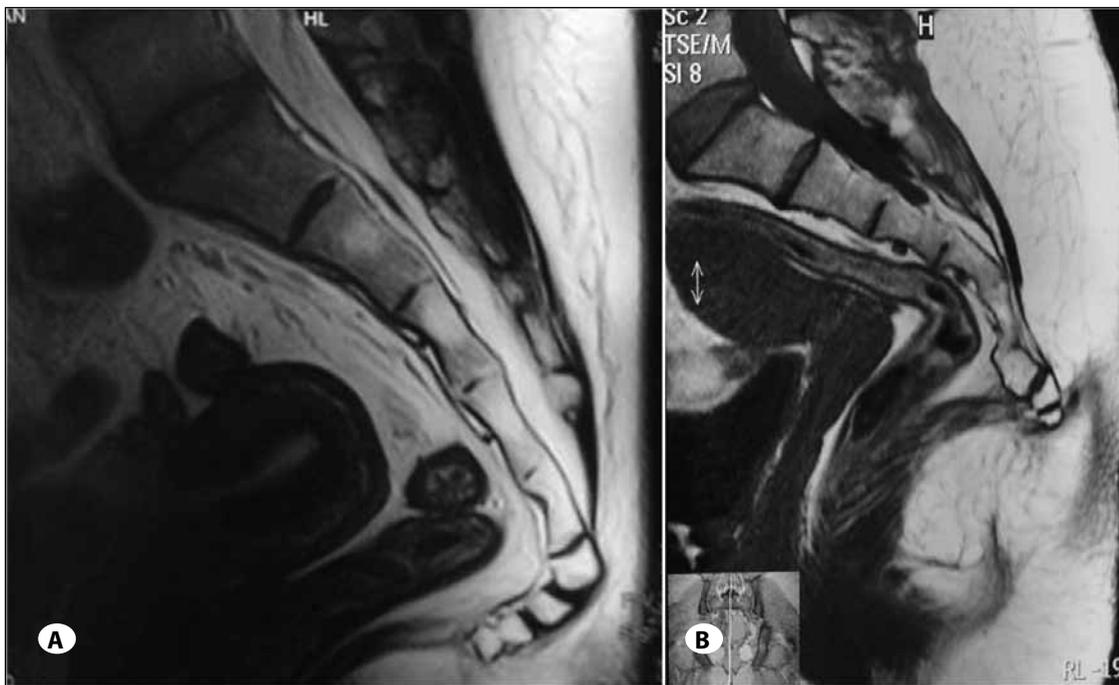


Figure 2:
A) Preoperative sagittal MRI of another Postacchini Type III case,
B) Postoperative sagittal MRI of the case.

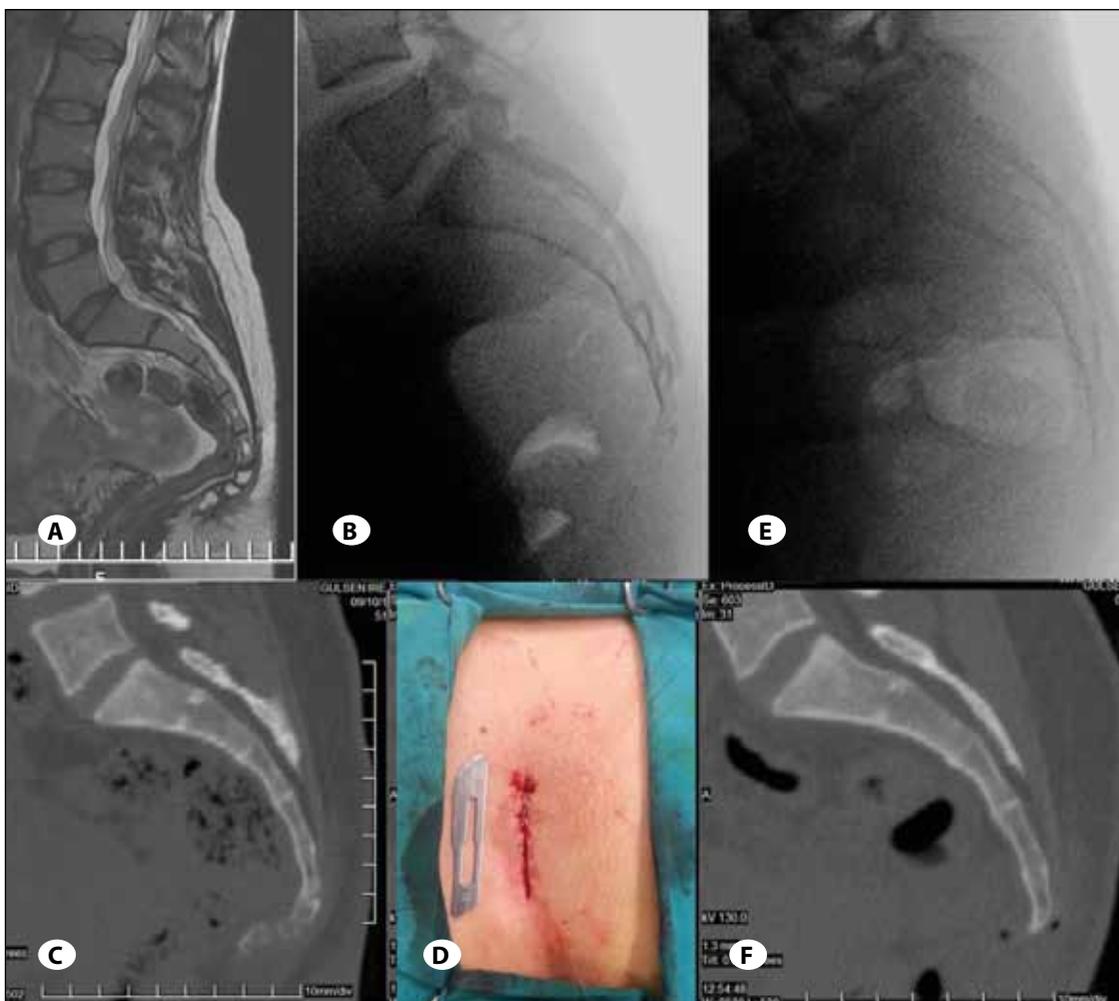


Figure 3:
A) Preoperative sagittal MRI of a Postacchini Type II case,
B,C) Preoperative sagittal CT images of the same case,
D) Incision of the case is less than surgical blade,
E) Intraoperative view of the flouroscopy
F) Postoperative sagittal CT image of the case.

Surgical intervention must be considered for patients who do not respond to steroid and local anesthetic injection. Wray reported 91% success rate for the patients that underwent coccygectomy (11), while Maigne reported 83.3% success rate for the patients that had coccygectomy (4). Boyne et al. searched for the effect of etiology on coccygectomy results and reported a success rate of 75% in postpartum and 50% in idiopathic cases. On the other hand, in their study Trollegaard et al. reported that traumatic coccydynia cases had achieved better results compared to the idiopathic cases (9). In our series, we did not spot the effects of etiology on the outcomes of treatment. However, it may be stated that idiopathic coccygodynia was generally observed to benefit

less from both local steroid injection and surgical treatment. (Table II) The pain was more severe especially in traumatic patients with higher angulation due to higher stretching of the Levator ani muscle. It may be stated that this group did not benefit from steroid injection (Table II).

The surgical procedure may require removal of the motor segment or complete removal of the coccyx. Wound infection is the most common post-operative complication of coccygectomy. Coupled with local contamination, the rate of wound infection increases to 22% (5). Therefore, post-operative prophylactic antibiotic use is recommended (10). In our series, the infection rate was 4% (one case). One way to prevent infection is to avoid rectal touch during surgery.

Table II: The Patients' Age, Gender and Etiology, Pre-Treatment VAS and Post-Treatment VAS

Case	Age	Gender	Etiology	Classification	Pretreatment VAS	Posttreatment VAS	Treatment
Case 1	29	Female	Pregnancy	Type I	7	2	Injection
Case 2	27	Female	Pregnancy	Type I	6	1	Injection
Case 3	37	Female	Idiopathic	Type I	6	0	Injection
Case 4	32	Female	Pregnancy	Type I	8	1	Injection
Case 5	45	Male	Trauma	Type II	8	1	Injection
Case 6	35	Female	Pregnancy	Type I	7	2	Injection
Case 7	34	Female	Trauma	Type II	9	2	Injection
Case 8	32	Male	Trauma	Type I	8	2	Surgery
Case 9	36	Female	Idiopathic	Type I	8	3	Surgery
Case 10	34	Male	Trauma	Type I	9	1	Surgery
Case 11	41	Female	Idiopathic	Type I	7	2	Surgery
Case 12	29	Male	Trauma	Type IV	10	2	Surgery
Case 13	44	Female	Trauma	Type I	8	1	Surgery
Case 14	42	Female	Trauma	Type I	8	1	Surgery
Case 15	36	Female	Trauma	Type I	9	2	Surgery
Case 16	34	Female	Trauma	Type III	9	2	Surgery
Case 17	30	Female	Idiopathic	Type I	8	2	Surgery
Case 18	44	Female	Trauma	Type I	9	2	Surgery
Case 19	38	Female	Trauma	Type III	9	1	Surgery
Case 20	56	Male	Trauma	Type I	7	0	Surgery
Case 21	47	Female	Trauma	Type I	7	0	Surgery
Case 22	36	Female	Idiopathic	Type I	8	2	Surgery
Case 23	34	Male	Trauma	Type III	9	1	Surgery
Case 24	45	Female	Trauma	Type I	10	2	Surgery
Case 25	32	Female	Trauma	Type I	9	2	Surgery
Case 26	55	Female	Trauma	Type I	8	1	Surgery
Case 27	33	Male	Trauma	Type I	8	0	Surgery
Case 28	32	Female	Trauma	Type I	9	2	Surgery
Case 29	30	Female	Idiopathic	Type I	8	2	Surgery
Case 30	51	Male	Trauma	Type I	7	0	Surgery
Case 31	29	Female	Trauma	Type I	9	2	Surgery
Case 32	34	Female	Trauma	Type I	8	1	Surgery

CONCLUSION

Coccygodynia is underrated in neurosurgical practice. Basic approaches in the treatment of coccygodynia include manoeuvres such as rectal massage in addition to several conservative treatment procedures, local injections and surgical treatment. While local steroid injection is an effective method of treatment for Type I patients, coccyx removal is an effective method for controlling the pain in patients with trauma history and in Type II, III and IV patients.

REFERENCES

1. Ballain B, Eisenstein M, Alo G, Darby A, Cassar-Pullicino V, Roberts S, Jaffray D: Coccygectomy for coccydynia: Case series and review of literature. *Spine* 31:E414-420, 2006
2. Blocker O, Hill S, Woodacre T: Persistent coccydynia – the importance of a differential diagnosis. *BMJ Case Rep* 2011:2011, pii: bcr0620114408
3. Fogel G, Cunningham P, Esses S: Coccygodynia: Evaluation and management. *J Am Acad Orthop Surg* 12:49-54, 2004
4. Maigne JY, Guedj S, Straus C: Idiopathic coccygodynia. Lateral roentgenograms in the sitting position and coccygeal discography. *Spine* 19:930-934, 1994
5. Maigne J, Doursounian L, Chatterlier G: Causes and mechanisms of common coccydynia: Role of body mass index and coccygeal trauma. *Spine* 25:3072-3079, 2000
6. Porter KM, Khan MAA, Piggott H: Coccydynia: Retrospective review. *J Bone Joint Surg* 63-B: 635-636, 1981
7. Postacchini F, Massobrio M: Idiopathic coccygodynia. Analysis of fifty-one operative cases and a radiographic study of the normal coccyx. *J Bone Joint Surg (Am)* 65:1116-1124, 1983
8. Rao G, Chang GJ, Suk I, Gokaslan Z, Rhines LD: Midsacral amputation for en bloc resection of chordoma. *Neurosurgery* 66:41-44, 2010
9. Trollegaard AM, Aarby NS, Hellberg S: Coccygectomy: An effective treatment option for chronic coccydynia: Retrospective results in 41 consecutive patients. *J Bone Joint Surg* 92: 242-245, 2010
10. Wood KB, Mehbod AA: Operative treatment for coccygodynia. *J Spinal Disord Tech* 17:511-515, 2004
11. Wray CC, Easom S, Hoskinson J: Coccydynia. Aetiology and treatment. *J Bone Joint Surg Br* 73(2):335-338, 1991