

Coccygectomy can be a option for coccydynia which is refractory to medical treatment

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Article Info

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Received: 28 July 2018
Accepted: 4 December 2018
Available Online: 25 December 2018

ISSN: 2224-7750 (Online)
2074-2908 (Print)

DOI: 10.3329/bsmmuj.v11i4.38617

Keywords: Coccygectomy; Coccydynia; Pain; Visual analogue scale

Cite this article:

Islam MA, Batajoo S, Mahmud MSA, Shrestha M. Coccygectomy can be a option for coccydynia which is refractory to medical treatment. *Bangabandhu Sheikh Mujib Med Univ J.* 2018; 11: 282-285.

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A Journal of Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Abstract

The aim of this study was to evaluate the clinical outcome of coccygectomy those who were refractory to conservative treatment. Twenty patients (5 males, 15 females) underwent total coccygectomy when coccygodynia did not responding to medical treatment July 2013 to September 2018. All the patients timely attended with non-traumatic (n = 12) and traumatic (n = 8) cause with mean follow-up visits of 24 months (range 18-28 months). The outcome pain intensity was evaluated by visual analogue scale (VAS) in sitting position and during daily activities. Three patients had infection which improved after antibiotic therapy. The VAS improved from 6.4 ± 0.9 to 2.1 ± 0.9 for sitting and from 5.8 ± 0.9 to 1.6 ± 0.6 for daily activities. Improvement in pain and daily activities were significant at the final follow-up. Ninety percent patients were satisfied with the operation.

Introduction

Coccygodynia was first described by Simpson in 1859.¹ Coccydynia refers to the pain in the coccygeal region. Abnormal mobility of the coccyx is present in most of the cases which causes chronic inflammatory process.² The coccyx is the last bone of the spinal column which is formed by 3-5 separate or fused vertebrae.³ The coccyx serves as an attachment for sacrospinous, anterior, posterior coccygeal and lateral sacrococcygeal ligaments as well as levator ani and coccygeus muscles. These structures prevent the sagging of pelvic contents.⁴ The coccyx may be of four types. In type 1, it is slightly curved forward, in type 2, curvature points straight forward, in type 3, it acutely angled in forward direction and in type 4, there is sacrococcygeal or intercoccygeal joint subluxation.⁵ The mean age of onset is usually at 40 years and the disease is more common in female because the coccyx is more prominent in female.⁶ The factors responsible are sacrococcygeal instability, high body mass index, trauma and childbirth. It may be primary (idiopathic, traumatic, infection, tumor, sacrococcygeal osteoarthritis, congenital, etc) or secondary (lower lumbar stenosis, neural tumors, rectal tumors and infections, urogenital system and metastases).⁷

The primary management of coccydynia is the conservative treatment with success rate of 90%.⁸ Non-operative treatment is the basis of

treatment. NSAIDs are used to reduce inflammation and pain. The pressure on the coccyx can be reduced by the use of laxatives. Lifestyle modification i.e. avoiding excessive pressure on the coccyx by using soft seats and ring cushions are the principle of conservative treatment. Therapeutic injection is also recommended.⁹ The patient of primary coccydynia does not give satisfactory result by conservative treatment and hampering daily activities, the surgery is necessary. Surgery can be partial or complete coccygectomy.¹⁰ Several studies show good surgical outcome in patients with persistent pain who did not respond to conservative treatment.¹¹ Surgical treatment of coccydynia was viewed cautiously in the past because of its high complication rates but better outcome have been shown in recent studies.^{12,13}

Materials and Methods

This prospective study was conducted in the Bangabandhu Sheikh Mujib Medical University and other private hospitals in Dhaka from July 2013 to September 2018. Fifteen patients were female and five were male. The mean age of the patients was 35.5 ± 6.0 years. All patients received adequate conservative treatment for at least eight months. Before surgery, the average duration of pain was 12.9 months (9-18 months). The clinical evaluation was done and the radiological examination showed subluxation of sacrococcygeal junction (Figure 1). On



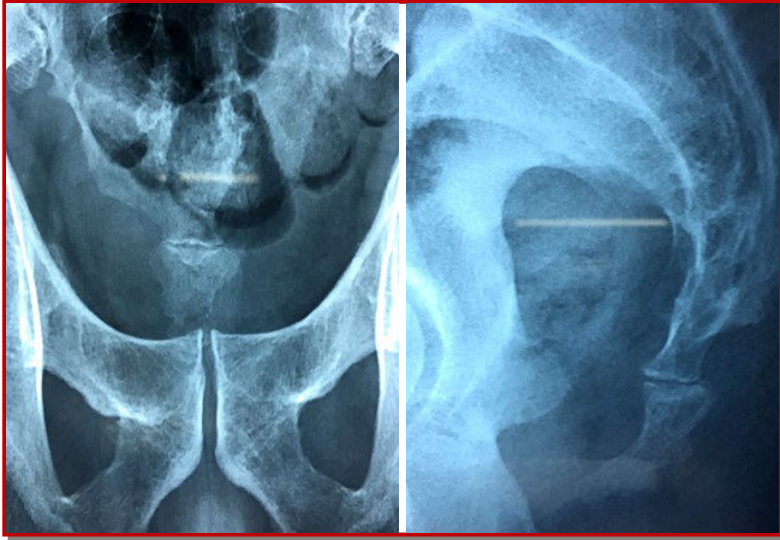


Figure 1: Preoperative anteroposterior and lateral X-ray images of sacrococcygeal spine

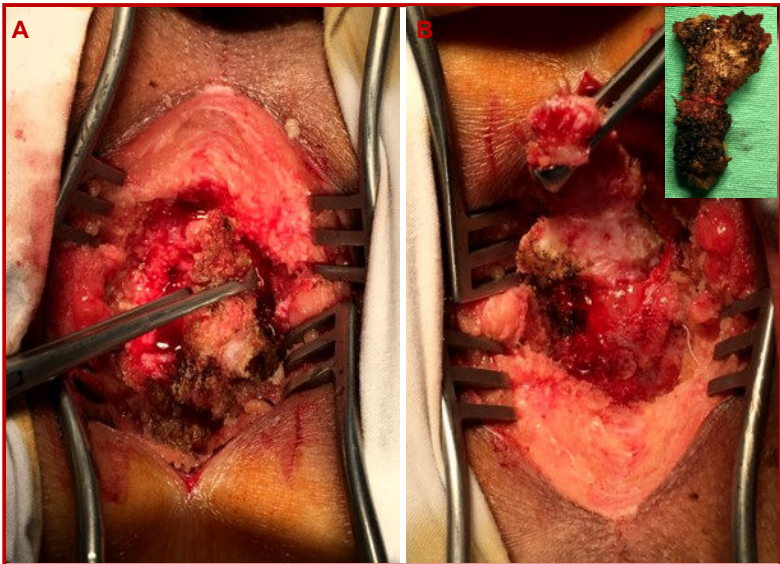


Figure 2: Per-operative pictures shows resection procedure of coccygectomy (A, B); Picture of a resected coccyx (inset)

clinical examination, all patients had marked tenderness over the coccyx. A digital examination was performed to exclude other pathology. All the patients underwent coccygectomy.

Surgical technique

Coccygectomy can be done by Powers and Gardner techniques.^{14, 15} The position of the patient was prone on a two parallel pillow, with hips and knees in flexion. A midline longitudinal incision was given in the back from the sacrococcygeal joint to the tip of the coccyx. The bone was dissected subperiosteally, holding the tip of the coccyx by Allis tissue forcep and sacrococcygeal joint disarticulation was performed. After that, distal

part of the sacrum was beveled by bone rasp (Figure 2). Meticulous hemostasis was achieved. The wound was irrigated with normal saline. Dressing was applied. Intra-venous antibiotics was continued for 5 days followed by oral antibiotics for 2 weeks. Sutures were removed after two weeks following surgery. Patients were allowed to mobilize and sit when the pain permitted.

All patients properly attended their follow-up regularly. The mean follow-up period was 24 months. Pre- and post-operative pain were evaluated by Visual analog scale (VAS). The outcome measures included VAS, in sitting and activities of daily living (Table I). The patients were also asked if they were satisfied with the operation. Satisfaction was categorized as - excellent, good, fairly satisfactory and unsatisfactory.

Statistical analysis

Statistical analysis was done using paired t-test with significance level of $p \leq 0.001$.

Results

Excellent results were observed in 5 (sitting), 10 (activities of daily living) patients, good in 10 (sitting), 8 (activities of daily living) patients, satisfactory in 5 (sitting), 2 (activities of daily living) patients and none of our patients had poor outcome. Table II shows the results of the VAS in sitting and during activities of daily living. The result was statistically significant with the p value $p < 0.001$. Wound infection was present in 2 (10%) cases, which resolved with antibiotics. Mean pre-operative VAS was 6.3 ± 0.9 for sitting and 5.7 ± 0.9 for activities of daily living which improved to 2.1 ± 0.9 for sitting and 1.6 ± 0.6 for activities of daily living after surgery at final follow-up. No other complications were found. Worsening of pain did not occur in any patient.

Discussion

In this study, successful results in 75% (sitting) and 90% (activities of daily living) cases which is similar to the series of Haddad et al. (2014)¹⁶ in which 85.7% patients had excellent to good pain relief. Capar et al. (2007)¹¹ and Trollegaard et al. (2010)¹⁰ reported 83.3% and 80.5% success after coccygectomy. Excellent result in 87.1% was shown by the study of Cheng et al. (2007)¹⁷ These studies show results similar to this study. Excellent and good results were found in 78% patients and 90% of the patients were satisfied with the result in the study of Ogur et al. (2017).¹⁸ The mean VAS preoperatively was 9.6 ± 0.8 and post-operatively 3.1 ± 3.1 . Excellent, good, fair and poor were 13, 9, 2 and 2 respectively in a series of Kerr et al. (2011)¹⁹,

Table I**Outcome categories**

| Outcome | Criteria |
|--------------|---|
| Excellent | Pain relief (75%), improvement of quality of life greater than 75%, less than 20% VAS (less than 2 of 10) rated pain in sitting, pain between 0 and 2 is score of activities of daily living |
| Good | Pain relief (50%), improvement in quality of life greater than 50%, between 20 and 30% VAS (less than 3 of 10) rated pain in sitting, pain between 1 and 3 is score of activities of daily living |
| Satisfactory | Pain relief (25- 50%), VAS (less than 6 out of 10) regardless of the other results |
| Poor | Regardless of the other results, pain relief (<25%), VAS more than 6 out of 10 |

Table II**Pre- and post-operative VAS scores**

| SL. No. | VAS (sitting) | | VAS (ADL) | |
|-----------|---------------|----------------|---------------|----------------|
| | Pre-operative | Post-operative | Pre-operative | Post-operative |
| 1 | 8 | 4 | 8 | 3 |
| 2 | 8 | 4 | 7 | 2 |
| 3 | 7 | 2 | 7 | 2 |
| 4 | 7 | 2 | 7 | 2 |
| 5 | 6 | 2 | 6 | 1 |
| 6 | 7 | 2 | 6 | 1 |
| 7 | 7 | 2 | 6 | 2 |
| 8 | 5 | 2 | 5 | 2 |
| 9 | 5 | 1 | 5 | 1 |
| 10 | 5 | 1 | 5 | 1 |
| 11 | 6 | 1 | 5 | 1 |
| 12 | 6 | 2 | 5 | 2 |
| 13 | 7 | 3 | 6 | 3 |
| 14 | 7 | 2 | 6 | 2 |
| 15 | 7 | 3 | 6 | 1 |
| 16 | 5 | 1 | 4 | 1 |
| 17 | 7 | 3 | 6 | 2 |
| 18 | 6 | 2 | 5 | 1 |
| 19 | 6 | 2 | 5 | 1 |
| 20 | 5 | 1 | 5 | 1 |
| Mean ± SD | 6.35 ± 0.9 | 2.1 ± 0.9 | 5.75 ± 0.9 | 1.6 ± 0.6 |

ADL means activities of daily living

Kwon et al. (2012)²⁰ also showed good to excellent outcome in 84% patients.

Wound infection was reported in 19% of patients in the study by Pennekamp et al. (2005)²¹ Cebesoy et al. (2007)²² reported no infection in 21 patients all of whom received prophylactic antibiotics for 5 days. Doursounian et al. (2011)²³ had no infection in his series of 80 patients all of whom received two prophylactic antibiotics over 48 hours and pre-operative rectal enema. Ceftriaxone and flucloxa-

cillin were used as prophylactic antibiotics in all the patients before surgery and same antibiotics were used in postoperative period for five days, as well as preoperative rectal enema were given. In this study, we encountered 10% cases of wound infection. The infections were controlled after treatment with antibiotics according to culture and sensitivity. Wound infection is the most common complication ranging from 2 to 22%.²⁴ Several studies have shown that the infection rate can be reduced significantly by the use of five day course of post-operative antibiotics (second generation cephalosporins).^{22,25-27}

In a series of Antoniadis et al. (2014)²⁸ with 10 patients, 3 had complete absent of pain, five had VAS less than 3 out of 10 and 2 had VAS 3. In a review of 24 studies involving 671 patients, 11% complication rate has been reported. Wound infection were common complications (8.3%), delayed healing (0.9%) and wound hematomas (0.3%). Injuries of the intestinal tract, rectal prolapsed were very rare.²⁹ No statistically significant difference between the partial excision and complete excision group was found in the study done by Ogur et al. (2017)¹⁸ The limitation of this study is the low number of cases.

Conclusion

In our series, total coccygectomy showed good relief of pain in majority of the patients. With meticulous operative technique and correct patient selection, the outcome of coccygectomy is good in patients with coccydynia which is refractory to conservative treatment.

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