



# Coccygectomy: Therapeutic Results of 12 Cases of Posttraumatic Coccygodynia

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## Abstract

**Introduction** Coccygodynia is pain localized in the coccygeal region. Symptoms can be relieved after conservative treatment. In refractory cases, surgical treatment gives good clinical results. We report 12 cases of posttraumatic coccygodynia refractory to conservative treatment managed surgically.

**Materials and Methods** This was a retrospective analysis including the records of all patients operated on in the neurosurgery departments and units of the Conakry University Hospital and the Sino-Guinean Friendship Hospital for posttraumatic coccygodynia refractory to conservative treatment over a 4-year period from January 2019 to December 2022 with a minimum postoperative follow-up of 12 months.

**Results** Twelve cases were identified over a 4-year period with a mean age of 36 years and a male predominance (7 males/5 females). Coccygodynia was the main complaint and was present in all patients. The mean visual analog scale was 8.7 and the mean body mass index was 24.1. Sacrococcygeal computed tomography scans were performed in all patients. The indication for surgery was given after failure of conservative treatment. Three patients underwent partial resection of the coccyx and nine underwent total resection. All patients underwent postoperative sacrococcygeal radiography. Progress was favorable in 75% of patients. Morbidity included two cases of surgical site infection and zero mortalities.

**Conclusion** Although the number of cases in this study was small, our positive results in terms of symptom improvement and satisfaction rates suggest that coccygectomy is a relatively safe and effective means of treating traumatic coccygodynia when nonsurgical methods have failed.

## Keywords

- coccygodynia
- coccygectomy
- posttraumatic
- conservative treatment
- Conakry University Hospital

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## Introduction

First introduced in 1859 by Simpson, the word coccygodynia refers to a painful symptom of the coccygeal region.<sup>1</sup> It is a relatively rare condition, the etiology of which is difficult to understand. It can be caused by trauma, local inflammation, tumor, and childbirth and can be idiopathic at times.<sup>2,3</sup>

Treatment depends on the severity of the pain and the degree of disability. The initial management of coccygodynia is nonsurgical. Commonly used methods include anti-inflammatory drugs, physical therapy, cushions, manual therapy, and injection of a local anesthetic with a corticosteroid. Symptoms are relieved or alleviated in most cases after conservative treatments. In refractory cases, excision of the coccyx gives good clinical results.<sup>3,4</sup>

In this study, we report the clinical results of coccygectomy in 12 cases of posttraumatic coccygodynia refractory to conservative treatment.

## Materials and Methods

Over a period of 4 years (January 2019 to December 2022), we retrospectively studied the records of all patients operated on in the neurosurgery departments and units of the university hospitals of Conakry and the Sino-Guinean Friendship Hospital for posttraumatic coccygodynia refractory to conservative treatment. All patients had a thorough clinical examination and underwent sacrococcygeal imaging via a computed tomography (CT) scan. The indication for surgery was based on the presence of posttraumatic coccygodynia refractory to conservative treatment with a coccygeal lesion (fracture or dislocation) on imaging.

All patients underwent a standard postoperative X-ray and clinical evaluation at 1, 3, and 6 months and  $\geq 1$  year after surgery. The parameters studied were age, sex, time to

consultation, clinical examination, visual analog scale (VAS), body mass index (BMI), lesions on CT scan, time to surgery, and evolution. Functional results were assessed after 1 year using the Oswestry score.

Progress was judged as follows:

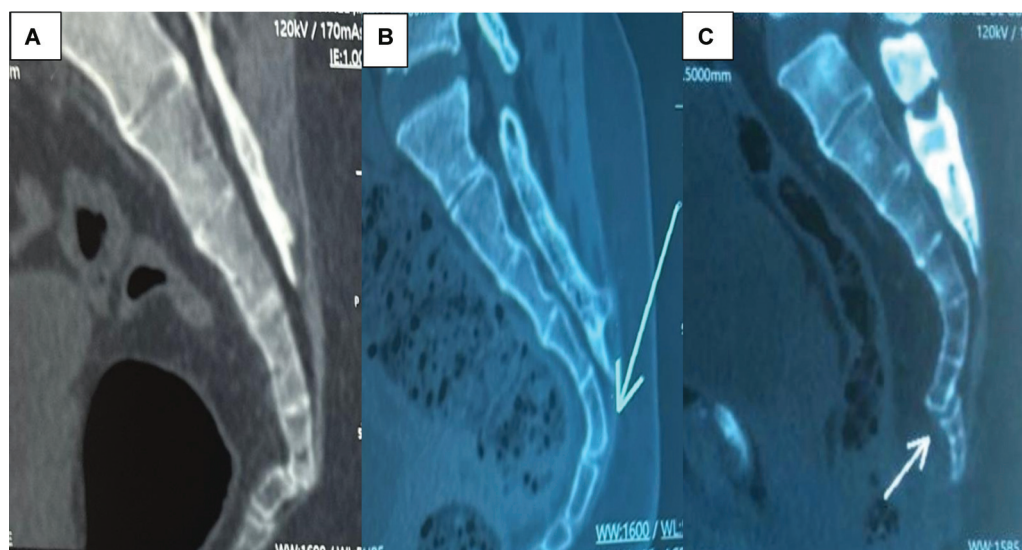
- Favorable: complete regression of clinical symptoms.
- Moderate: persistence of residual clinical symptoms.
- Unfavorable: no clinical improvement.

All data were expressed as mean for continuous variables and as percentage for categorical variables. Data were analyzed using Épi Info Version 7.2.2 software.

## Results

Twelve patients were enrolled. There were seven men and five women with an average age of 36 years (extremes: 16 and 60 years). The clinical picture consisted essentially of coccygodynia, which was present in all patients. The average delay in consultation was 6 months (range: 3–9 months). Physical examination revealed a painful sacrococcygeal spinal syndrome in all patients, with no associated neurological signs. The mean VAS score was 8.7 (range: 7–10). Mean BMI was 24.1 (range: 18–31). CT scans (**►Fig. 1**) were performed in all patients to assess the lesions (**►Table 1**). Surgery was indicated in all patients after failure of at least 12 weeks of conservative treatment. Three patients underwent partial resection of the coccyx and nine underwent total resection (**►Fig. 2**). All patients had a postoperative sacrococcygeal radiograph (**►Fig. 3**).

The average follow-up was 16 months (extremes: 12 and 24 months). Out of the 12 patients, we noted 2 cases of surgical site infection. There was no operative mortality. The outcome was favorable in nine cases (75%) and fair in three cases (25%). The mean postoperative VAS was 1 (range: 0–5) at 1 year postoperatively. The Oswestry score at 1 year postoperatively is summarized in **►Table 2**.



**Fig. 1** Types of injury. (A) Sacrococcygeal dislocation. (B) Sacrococcygeal subluxation. (C) Coccygeal fracture.

**Table 1** Types of injury

Types of injury	n = 12
Fracture	7
Luxation	4
Subluxation	1

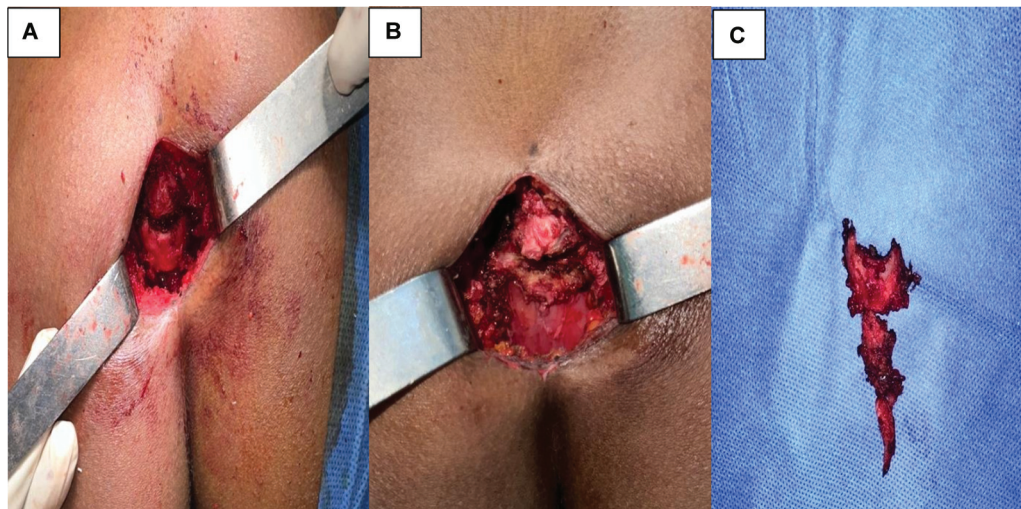
## Discussion

In contrast to our series (predominantly male), the literature shows that coccygeal lesions are more frequent in women than in men, with an incidence ratio of 5 women/1 man.<sup>5–8</sup> Galhom et al<sup>9</sup> state as a matter of fact that the female sacrum and coccyx are situated further posterior and the coccyx is longer in females as compared with males, making it more prone to injury in females compared with males. In addition, it is more common in cases of obesity; a BMI of 27.4 in women and 29.4 in men increases the risk of developing coccygodynia,<sup>10,11</sup> 24.1 in our series. The predominance of

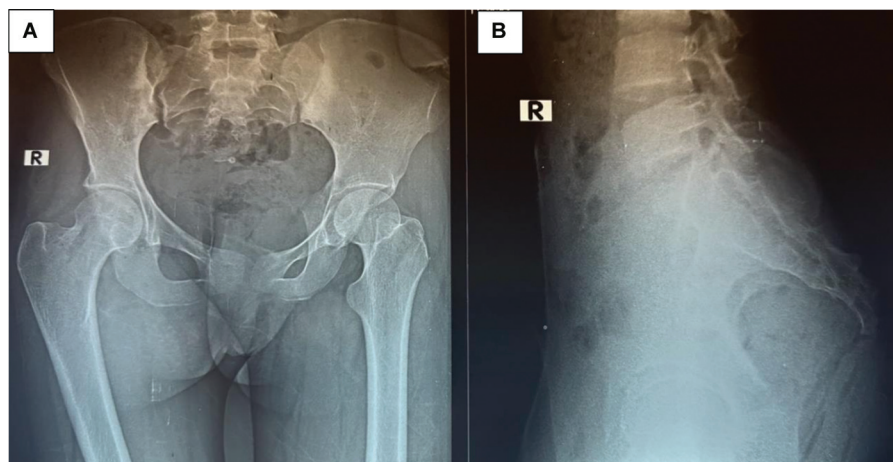
the male sex in our series could be explained by the traumatic etiology, probably due to the greater exposure of men to trauma because of their social function. Direct or indirect trauma to the coccyx can lead to chronic coccygodynia. The most frequent accident mechanism is axial impact on the most distal part of the spine.<sup>12</sup> Depending on the severity of the impact, injuries can range from slight distortion without bone or ligament damage or a nondisplaced fracture in the caudal coccygeal segments to a severely displaced fracture of the sacrococcygeal complex. All of these lesions can lead to chronic coccygodynia that is refractory to therapy.<sup>13</sup>

Clinically, the most common presentation is pain around the coccyx, aggravated by sitting and rising from a sitting position.<sup>14</sup> Less commonly, pain may occur during defecation or sexual intercourse.<sup>15</sup>

The significant delay in consultation in our series, an average of 6 months, can be explained by the lack of financial resources available to most patients and by the influence of traditional medicine in our culture, which leads most patients to consult traditional practitioners before



**Fig. 2** Intraoperative and postoperative images of complete coccygeal resection. (A) Focal point of sacrococcygeal dislocation. (B) Complete coccygeal resection. (C) Coccygeal piece.



**Fig. 3** Postoperative radiograph of complete coccyx resection. (A) Front view. (B) Profile view.



**Table 2** Distribution of cases according to Oswestry disability index at 1 year post-op

	Staff	Percentage
No handicap (0–4 points)	9	75
Slight handicap (5–14 points)	3	25
Moderate disability (15–24 points)	0	00
Severe disability (25–34 points)	0	00
Complete disability (35–50 points)	0	00
Total	12	100

seeking medical care, where the cost of certain investigations can delay diagnosis even further, in a context where there is little to no medical insurance available. As a result, coccygeal lesions are sometimes diagnosed at a late stage.

Diagnosis of coccygodynia is relatively straightforward, provided that other etiologies for pain are ruled out. Once the diagnosis is suspected, lateral radiographs in the sitting and standing positions are usually sufficient to establish the radiographic diagnosis. However, when the initial imaging is negative but the clinical suspicion is high, higher-level imaging tests should be considered, in particular CT scans, as in the case of the patients in our series. Because of the aligned position of the fragment, radiography may exclude the possibility of a fracture.<sup>15</sup>

The primary management of coccygodynia remains conservative treatment, which has been successful, with a success rate of approximately 90%.<sup>16</sup> Surgery may be considered in symptomatic cases with functional discomfort where all appropriate conservative measures have failed to relieve the pain.<sup>3</sup> The surgical technique for the treatment of coccygodynia is the same throughout the literature, namely coccygectomy, technically performed by subperiosteal dissection through a longitudinal midline incision and resection of the distal part of the coccyx from the affected joint and smoothing of all bone chips at the lower end of the remainder of the coccyx.<sup>13,17–19</sup>

Many publications report positive results in patients who have undergone coccygectomy. In the series by Cheng et al<sup>3</sup> and Doursounian et al,<sup>20</sup> coccygectomy in patients with failed conservative treatments reported success rates of 87.1 and 79%, respectively. This was 75% in our series, which corresponded to the reported success rates of 60 to 91%.<sup>5,13,21–23</sup> To date, there has been no significant difference in pain reduction between partial and total coccygectomy.<sup>24</sup> The majority of patients in our series had complete resolution of symptoms with a mean postoperative VAS score of 1 and were subjectively very satisfied with the results of surgery. However, three patients had an average result. Improvement appeared in the second or third month, sometimes only after 6 to 10 months. In a few rare cases, it took 1 to 2 years before definitive recovery was achieved. This long delay may be due to the presence of deafferentation pain (phantom limb syndrome).<sup>25</sup>

Surgical site infection is the most frequently reported postcoccygectomy complication, 6.5, 7, and 19%, respectively, in the series by Cheng et al,<sup>3</sup> Pennekamp et al,<sup>21</sup> and Sehirlioglu et al,<sup>13</sup> and 16.6% in our series (2 cases out of 12). In fact, the management of postcoccygectomy wounds remains difficult. The local skin flora, the patient's difficulty in visualizing and treating the wound, and the tension exerted on the wound by the sitting position undoubtedly contribute to this higher-than-normal complication rate.<sup>13</sup> Because of the proximity of the anal region and the risk of contamination, perioperative prophylaxis with antibiotics, administered as a single course or 2 to 3 days after the operation, is recommended.<sup>13</sup> Doursounian et al<sup>20</sup> and Cebesoy et al<sup>4</sup> report, respectively, 48 hours and 5 days of antibiotic prophylaxis in their series without any case of postoperative infection. In our study, all patients received prophylactic antibiotics before the operation and postoperative antibiotic therapy for 72 hours.

## Conclusion

Although the number of cases in this study was small, our positive results in terms of symptomatic improvement and satisfaction rates suggest that coccygectomy is a relatively safe and effective means of treating traumatic coccygodynia when nonsurgical methods have failed. However, careful selection of suitable patients for coccygectomy prior to surgery and prophylactic antibiotics is essential to achieving positive results.

The main limitations of this study are the small number of cases in the series and its retrospective nature. The encouraging results of this study prompt us to suggest further large-scale prospective evaluations of the surgical treatment of posttraumatic coccygectomy.

## Authors' Contributions

All authors have read and approved the final version of the manuscript. L.F.B., A.B.B., and M.L.B. conceptualized the article. A.S.K., H.G.A., A.D., I.S.S.J., M.C., D.B., A.R.D., F.I.K.K., A.Y.C., S.B. and I.S.S. gathered the data. All the authors revised the article and approved the final draft of the article that was submitted. L.F.B. and I.S.S. provided guidance toward the completion of the article.

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## Conflict of Interest

None declared.

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