

## Resection of the coccyx as an outpatient procedure

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### Abstract

We wished to determine if coccygectomy as an outpatient procedure is a safe alternative to inpatient treatment. 68 patients were treated at our institution with coccygectomy as an outpatient procedure during a seven-year period. Out of these 61 (90%) responded to final follow-up questionnaires after a minimum of one year. We recorded satisfaction with the outpatient modality, and compared postoperative complications and long-term satisfaction with patients who had been operated as inpatients during the same period. Out of the 61 patients who responded to final follow up, 39 (64%) were satisfied with having the operation as an outpatient procedure. The patients who would have preferred overnight hospitalization generally felt that traveling home the same day was painful. There was significantly less pain on the journey home if the procedure had been performed under spinal anaesthesia. In terms of complications, there were 10% reoperations due to deep infection in the outpatient group, and 12% superficial wound infections treated with oral antibiotics. The corresponding numbers for the in-patient group were 8% and 14%. The long-term success rate was similar for both groups. 87% of outpatients and 89% of inpatients reported that they would have consented to the operation if they had known the result in advance. Coccygectomy as an outpatient procedure gives similar results to inpatient treatment and can be regarded as an acceptable alternative. Spinal anaesthesia reduces postoperative pain on the journey home.

### Introduction

Chronic coccydynia, or tailbone pain, may be severe and resistant to conservative treatment. In cases where conservative

treatment and injection therapy have failed patients can be treated surgically with coccygectomy.<sup>1,2</sup>

Traditionally, coccygectomy patients spend several days in hospital after their operation. In the 1990s, the average stay after this procedure was 7-10 days.<sup>3</sup>

Outpatient surgery (also known as day surgery, same-day surgery or ambulatory surgery) refers to surgical procedures that are performed without staying overnight in the hospital. Following advances in peri- and postoperative pain control regimens and early rehabilitation protocols there has been a trend in other areas of surgery towards performing more outpatient procedures. In recent years, this has included procedures such as unicompartamental knee arthroplasty, and even total hip arthroplasty,<sup>4</sup> commonly regarded as an inpatient procedure. This development has the benefit of reducing costs and instigating early rehabilitation, without compromising results or patient satisfaction.<sup>5,6</sup>

In line with this trend, we have performed coccygectomy as an outpatient procedure in selected patients and now wished to review our results.

The purpose of this study was to determine if outpatient surgery of the coccyx is a safe alternative to hospitalization.

### Materials and Methods

Patients were referred to us by general practitioners and other hospitals when non-invasive treatment had failed. All diagnoses were confirmed by a senior spinal surgical consultant (RGK) based on a thorough medical history, clinical examination and imaging with either coccygeal radiographs, MRI, or both.

In case of severe symptoms, patients were initially offered targeted injections with a mixture of lidocaine and corticosteroid. If this treatment failed to give lasting results, patients were offered surgery.

A total of 184 patients were operated in our department for coccydynia between 2009 and 2016. A total of 68 were operated as outpatients while 116 were admitted to the ward until the day after surgery. Selection was mainly on geographic grounds. Those who had less than two hour's travel to their home were treated as outpatients provided they were classified as ASA 1 or 2 on the American Society of Anesthesiologists classification. These patients were discharged from the hospital after a 3-6 hour postoperative observation period with prescriptions for oral pain medication and follow-up instructions.

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The standard pain prescription was paracetamol, tramadol, and diclofenac, although some individualization was performed as needed.

Out of the 68 outpatients, 52 had undergone a course of one to three corticosteroid injections (42 had one injection, 9 had two injections, and one had three injections) without a lasting satisfactory result.

Surgery was performed under either spinal or general anesthesia with antibiotic prophylaxis started preoperatively (Cephalotin 2g intravenously every 90 minutes, 4 doses in total, and one oral dose of Metronidazole 1g). Resection of the coccyx was done at the most proximal mobile segment, with the technique described by Key,<sup>7</sup> through a 4-5 cm midline incision and subperiosteal removal of the coccyx with monopolar and bipolar diathermy. Before closure, 20 ml of Ropivacaine 7.5 mg/mL was infiltrated into the area.

Outpatients were telephoned by an orthopedic nurse on the day after surgery to inquire about how they were doing and address any postoperative concerns.

Traditional physician-led morning rounds were performed for inpatients.

All patients were reviewed clinically 3-4 months after their operation and were followed up with a questionnaire at a minimum of 12 months after treatment. If the operation had been performed as an outpatient procedure, we included a separate questionnaire to evaluate satisfaction with this modality. Patients who had not responded to the questionnaires were reminded by telephone after 6 weeks and received new questionnaires if they wished.

A total of 171 (92%) operated patients responded to the final follow-up. We have, however, included all patients when recording postoperative complications during the first three months after surgery.

The mean follow-up was 39 (range 12-85) months. In the outpatient group there were 9 males and 59 females. Their mean age at referral was 40 (17-70) years. In the hospitalized group there were 19 males and 97 females. Their mean age was 37 (11-75) years.

Out of the 68 outpatients, 61 (90%) responded to our final follow-up. They had had symptoms of coccydynia for a mean of 36 (4-252) months before presentation.

There were six patients who were intended as outpatients but converted to inpatients. Four were due to insufficient postoperative pain relief, one to dizziness, and one to delayed start of surgery.

We also recorded the time it had taken for patients to travel home after surgery. There were 34 patients residing in the same municipality as our hospital, and therefore assumed to have less than 30 minutes travel time home, and 27 patients who lived in surrounding municipalities and were assumed to need between 30 and 120 minutes to get home.

Statistical testing of categorical data was done with the chi-square test.

The study was reviewed by the Regional committee for medical and health research ethics in Central Norway (2016/460) who found that it did not need their approval.

## Results

### Satisfaction

In the outpatient procedure group 53 (87%) reported that they would have consented to the operation if they had known the outcome in advance, compared to 98 (89%) of the inpatients.

Out of the 22 patients who had been operated under spinal anaesthesia, 20 were satisfied with this, while two stated that they would have preferred a general anaesthetic.

The remaining 39 were operated under a general anaesthetic, and all were satisfied with this. Of the 61 outpatients at final follow-up, 39 were satisfied with having the operation as an outpatient procedure, while 18 explained that completing the journey home the same day had been more painful than anticipated. The remaining four patients would have preferred overnight hospitalization for other practical reasons. 15 (83%) of the patients who felt the journey home had been too painful had been operated under a general anaesthetic, while only 3 (17%) patients had had a spinal anaesthetic ( $p=0,048$ ). Out of the 34 patients with less than 30 minutes travel time home, 10 (29%) reported dissatisfaction because their journey was too painful. Among the 27 patients with 30-120 minutes travel time, eight (30%) reported the same. With regards to the first day follow-up call by a nurse, only one was dissatisfied with this.

### Complications

None of our outpatients were re-hospitalized for postoperative pain management after their initial discharge.

Seven patients (10%) in the outpatient group developed deep postoperative infection requiring operative debridement. They were re-operated 3-5 weeks after their initial surgery and went on to subsequent healing. There were a further eight patients (12%) with spots of serous drainage from the wounds persisting beyond the first 1-2 weeks. As there were no other infective signs, they were regarded as superficial wound infections, and resolved with a course of oral antibiotics.

In comparison, out of the 116 patients who were operated as inpatients, nine (8%) were subsequently re-operated due to infection, while 16 (14%) were treated with antibiotics for superficial wound infections.

There were no significant differences in either postoperative infections or long-term satisfaction between the groups, nor any difference in satisfaction between patients with short or long journeys home after surgery.

## Discussion

About one third of our outpatients stated that they would have preferred to stay at the hospital post-operatively, mainly because the journey home had been painful. A limitation of this study was that we did not have comparable data for the inpatients with regard to discomfort at the time of discharge. It is likely that a considerable proportion of the inpatients may also have had enough pain at the time of discharge to have

preferred a longer hospital stay.

Others have found that there is less postoperative pain in outpatient procedures such as knee arthroscopy and lower abdominal surgery when performed under spinal anaesthesia, rather than a general anaesthetic.<sup>8</sup> Our findings show that the patients who were operated under spinal anaesthesia had significantly less pain on their journey home. As a consequence, we are now performing most coccygectomies under spinal anaesthesia.

Reviewing our data, we have nevertheless been compelled to explore more effective pain treatment protocols to make the journey home more tolerable. The addition of pre-operative gabapentin as an adjunct in multimodal pain management has been advocated for several procedures<sup>9</sup> and has now been added to our protocol. Only one patient was dissatisfied with having a nurse telephone for the first-day follow-up. This is an established method of follow-up for other types of outpatient surgery<sup>10</sup> and seems applicable to this procedure as well.

Coccygectomy as an outpatient procedure has to our knowledge not previously been described in the literature. There is however considerable literature about other procedures that have recently been transformed to outpatient procedures.<sup>5,6,11</sup> One of the key components to this is patient selection. We have limited our patient selection to postoperative travel distances within 2 hours, granted that the patients are medically fit, with an ASA score of <2. We had expected increasing travel time home after surgery to correlate with more pain. Surprisingly, a similar proportion of patients reported undue pain on their journey home, regardless of how close to the hospital they lived. Two of our outpatients were adolescents (17 years) at the time of the operation. We have not performed this procedure as an outpatient procedure in younger patients than 17 years, but have previously found that adolescent coccygectomy patients in general have similar results to adults.<sup>12</sup> There is comparable literature available on other orthopaedic outpatient procedures in adolescent populations,<sup>13</sup> which would suggest that this could also be an acceptable treatment option. Our number of infections leading to re-operations were 10% and 8% for the out- and inpatient groups, but when counting superficial wound problems treated with antibiotics, the total number of infections were found to be 22% for both groups. Coccygectomy traditionally carries a high rate of postoperative infection and wound dehiscence. The rates are variable in the published literature. There have been published series reporting infection rates

requiring reoperation as low as 0-3,5%,<sup>14,15</sup> although most authors report rates of infection between 7-27% when also including superficial wound problems, treated with antibiotic therapy alone.<sup>16-20</sup>

## Conclusions

Coccygectomy as an outpatient procedure seems to have comparable outcomes to in-hospital management in terms of patient safety. The number of postoperative complications is similar to that for inpatient management. In the longer follow-up, we found that patients treated as outpatients were just as likely to have consented to the operation if they had known the result in advance. The main disadvantage is that about one third of outpatients complain of pain from the journey home, regardless of how short their journey is. This can be improved by operating under spinal anaesthesia.

This treatment has the benefit of reducing hospital costs, as one night hospitalized for this condition according to the financial department at our hospital has an average added cost of 11.000 Norwegian kroner (approximately US\$ 1.200). Another benefit is the reduction in the orthopedic ward occupancy, which at peak times may be very limited. In light of this, we shall continue to offer coccygectomy as an outpatient procedure to patients who qualify for this treatment.

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