Case Report

Symptomatic sacrococygeal joint dislocation treated using closed manual reduction: A case report with 36-month follow-up and review of literature

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ABSTRACT

Dislocation of the sacrococygeal joint is a rare injury from trauma to the buttocks, most often from falling backwards. Standard of care for this injury has not been determined because it is rare. Left untreated this can cause coccydynia in the long-term. Here we present a case report to describe the treatment of an anterior sacrococygeal dislocation with closed manual reduction. A 13-year-old female presented to the emergency department with buttck pain after slipping backwards down the stairs. On X-ray the coccyx was in bayonette apposition to the anterior distal sacrum and shortened by 6 mm. To manage the injury, closed manual reduction of the sacrococygeal joint was performed. To our knowledge, this is the first successful case of sacrococygeal dislocation treated with closed manual reduction, resulting in complete relief of symptoms at 36 months follow-up. Sacrococygeal dislocations can be treated with closed manual reduction, resulting in lower morbidity and faster recovery compared to surgical treatment.

Introduction

Dislocation of the sacrococcygeal joint is a rare condition wherein the coccyx separates from the sacrum, causing the coccyx to slip anterior or posterior. The most common cause of a sacrococcygeal dislocation is acute trauma from a fall onto the buttocks. Sacrococcygeal dislocations are also associated with childbirth, pregnancy, and obesity\cite{1}. Left untreated, this dislocation may cause childbirth and labor challenges in the future\cite{2}. Dislocation of the coccyx can pull or tear the surrounding tissues, causing inflammation and pain, which is increased when the patient is in the seated position. Treatment options include physical therapy, steroid injections into the joint, manual treatments, surgical treatment of pinning the sacrum and coccyx together, and coccygectomy\cite{3–5}.

Here we present a case where closed manual reduction was performed resulting in relief of pain and inflammation. Based on a review of literature, this is the first report of successful relief of symptoms with closed manual reduction maintained at 36 months follow-up.

The paucity of literature on sacrococcygeal treatments should not deter attempts to reduce the dislocation. However, due to the
low incidence of this injury and the lack of experience in its treatment, the coccyx is often not reduced. The misalignment of the sacrococcygeal joint could pull on the ligaments supporting the muscles around the area and can pinch on the last sacral nerve, which could lead to problems with movement, sitting, using the bathroom, walking, and sexual intercourse. Coccydynia in the adult population is difficult to treat. Persistent dislocation at a young age can cause longitudinal coccydynia that can be debilitating.

Case report

A 13 year-old female was seen in the emergency department with complaints of severe buttock and tailbone pain after slipping backwards down the stairs. She presented with exquisite tenderness over the distal sacrum and coccyx. There were no open wounds and no other identified trauma. Radiographs were obtained which demonstrated anterior dislocation of the sacrococcygeal joint (Fig. 1). The coccyx is in bayonette apposition to the anterior distal sacrum and shortened by 6 mm. She was discharged with treatment consisting of cyclobenzaprine (10 mg), diclofenac potassium (50 mg), and cold therapy.

The patient was referred to orthopedic surgery clinic one day after injury with a 3/10 pain in her buttocks at rest. Patient reported that she had a small bowel movement with quite severe pain. As a result, she was not able to completely evacuate her bowels. She had a BMI of 22.8 (83rd percentile). Upon physical exam, she had tenderness over the distal sacrum and coccyx. She had no ecchymosis, erythema or palpable swelling. There was no tenderness or injury to spine, upper, and lower extremities. There were no other significant physical exam findings. Treatment options were discussed with the family including observation, closed, and open reduction.

Given her present level of discomfort and bowel difficulty, they opted for intervention. After thorough discussion, including the paucity of guiding literature, the family elected an attempt at closed manual reduction. Two days after her injury, she was taken to the operating room and underwent induction of a general anesthetic including dense muscle relaxation. She was placed in the right lateral decubitus position.

A gloved finger was inserted through the anus, into the distal rectum, and used to first palpate the sacrococcygeal junction. The bony step-off was readily palpable. The coccyx was pinched between the index finger inside the rectum and the thumb externally, and force was applied to unlock the coccyx from an anterior bayonetted position. With full muscle relaxation, this required significant force applied digitally. Lateral fluoroscopy was utilized to observe the reduction (Fig. 2). After recreating the deformity, the coccyx

Fig. 1. Pre-op anterior dislocation of sacrococcygeal joint.
reduced with distally applied force from inside the rectum (Fig. 3). She tolerated the procedure well and she was discharged the same day on a strict bowel regimen, specifically docusate sodium (10 mg) twice daily. She was also given prescriptions for acetaminophen-codeine (300 mg), cyclobenzaprine, and diclofenac potassium. Patient was also instructed to use a Tush Cush Orthopedic Seat Cushion (Kinetic Diversified Industries, Inc., San Diego, CA) at all times when sitting.

At one-week follow-up, she was able to walk, sit, and experienced significant reduction in pain. She had returned to normal activities and had no pain with her bowel movements. An x-ray was taken (Fig. 4) which demonstrated a partial loss of reduction of the coccyx compared to the intraoperative final fluoroscopic position. However, length was maintained and overall alignment was acceptable. She was instructed to continue with the stool-softeners and as needed pain medications. She was instructed to continue to use the cutout pillow.

By two weeks, she had discontinued all prescription medications. She complained of soreness for approximately four weeks following the procedure, which was managed with ibuprofen. There were no post-procedure complications. She experienced no additional other issues than a complaint of soreness for the first 4 weeks. This was well treated with ibuprofen. Upon final follow-up, which was 36 months post-op, she states she has experienced no pain or discomfort, no difficulty with sitting or other activities, and

Fig. 2. Intra-op fluoroscopy of closed manual reduction of dislocation.

Fig. 3. Closed manual reduction of anterior dislocation of coccyx. Fascia in posterior rectum from anterior to posterior mesorectum (yellow), mesorectal visceral fascia (green), mesorectal parietal fascia anterior leaf (orange), mesorectal parietal fascia posterior leaf (red), and Waideye's fascia (blue). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)
normal bowel function, for the last three years.

Discussion

Sacrococcygeal dislocation is very rare and there is no established standard of care in the published literature. Previously three reports have shown four patients who had a dislocation of the sacrococcygeal joint. In two reports, closed manual reduction of the coccyx was attempted, but failed [2,6]. In two of the reports, the authors report then using surgical procedures to fix the dislocation [4,5]. None of the patients had neurological complications associated with injury.

Rijal & Pradhan present a 29-year old male with anterior dislocation of the coccyx over the sacrum who had a failed closed manual reduction. After the unsuccessful reduction attempt, he was managed with analgesics as he had refused surgery. Fortunately, the patient was asymptomatic after conservative treatment with hot packs and use of a two inch soft cushion. At 8-month follow-up he no longer complained of pain [6].

Raissaki and Williamson presented the case of a 30-month old female with sacrococcygeal dislocation. They anticipated that the child might experience sexual problems and potential labor problems in the future due to her anterior dislocation of the coccyx. Because of the patient’s young age, the authors attempted a closed manual reduction under fluoroscopy. The reduction was unsuccessful and so they elected to monitor the injury via MRI for signs of edema and neurologic symptoms from potential complications of cauda equinna syndrome. Otherwise, they felt that reduction would be unnecessary [2].

With regards to surgical management, Kim and Kim reported using a joystick maneuver wherein a curved hemostat was used to reduce the sacrococcygeal joint and a smooth 2.4 mm diameter Steinman pin was placed to maintain stability [5]. Bergkamp and Verhaar saw a 26-year old woman with anterior dislocation following a fall down stairs. They fixed the sacrum and coccyx together using four vicryl sutures as tension bands [4]. In these cases, the patients had to undergo rehab and were not able to sit or lie supine for over six weeks. Despite protracted recovery, she showed normal alignment by 6 weeks and no complaint at two year follow-up. Due to the surgical nature of these treatments, the recovery was much more extensive. In the present case, the patient recovered fully within a week with a non-invasive procedure.

The amount of force required to reduce the sacrococcygeal joint was significant, thus there was a concern for laceration of the rectum. Jin and Peng show in their cadaveric study that Waldeyer's fascia, which divides the retrorectal space, which is where the finger was applying pressure for the reduction maneuver, into an inferior and superior compartment is avascular, contains no nerves,
and is a tough forgiving space [7]. Rectal lacerations not associated with other trauma below the peritoneal reflection generally heal uneventfully. In our case, there was no rectal injury.

Closed manual reduction is a minimally invasive and clinically successful method of treatment for this dislocation. The technique was similar to that previously described by Maigne in the treatment of coccydynia without mobilization of the coccyx [8]. The patient experienced relief of pain the same day and was able to resume all normal activities within a week and also regained normal bowel function. We suspect that the success of the conservative approach with closed manual reduction may be because the patient is healthy and young with a normal BMI and no associated neurological complications. As noted in the case report, some percentage of the reduction was lost. However, the coccyx maintained its out to length position rather than fully redislocating into the baryonette apposition position.

**Conclusion**

In the present report, a closed manual reduction was used to treat the dislocation of the sacrococcygeal joint. This treatment offers lower morbidity and faster recovery versus surgical treatment. Also it achieves a reduction compared to management with administration of analgesics and steroid injection. Even with incomplete reduction, our patient returned to normal activity, bowel function, and expectation of normal obstetric health.

The patient gave informed consent to the publication of the case study.

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