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Coccyx pain

CLINICAL REVIEW

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Coccyx pain, coccydynia, can occur as a result of trauma or childbirth, but the cause can also be unknown. Coccydynia is more common in women, and the symptoms usually subside within a few months. The main symptom is pain

when sitting. Alleviation of pain can be achieved by reducing pressure on the coccyx and treatment with corticosteroid injections. Surgery may be appropriate if these measures do not yield improvement. The purpose of this clinical review is to give a comprehensive update on the subject for doctors who encounter these patients.

Coccydynia was first described in around 680 AD by Paul of Aegina (1). Josiah Nott performed the first planned coccygectomy in 1843 (2). Coccydynia is pain in and around the coccyx. It is 3–5 times more common in women than men (3, 4). The incidence is unknown. A US study of patients with lower back pain found that 3 % had coccydynia (5). We assume that the prevalence is higher in Norway due to injuries related to seasonal injuries in winter.

The increased risk in women may be related to their pelvic anatomy, which makes the coccyx more prone to external trauma and childbirth injuries (6, 7). A high body mass index increases the risk (4), as does significant weight loss (3, 8).

Chronic coccydynia is defined as persistent pain for at least three months, which meets the definition for chronic pain in general. Coccydynia can also occur in adolescents (9). This clinical review provides evidence-based guidance on the work-up and treatment of the condition based on relevant literature and 16 years of experience in the treatment of over 1000 patients with coccyx pain at St Olav's University Hospital.

Pathophysiology

The anatomy of the coccyx varies widely between individuals, but the structure is roughly triangular and composed of 3 to 5 vertebrae that may be partly fused (Figure 1a). The most frequently preserved disc is found between the first and second coccygeal vertebrae (Co1–Co2) (7).

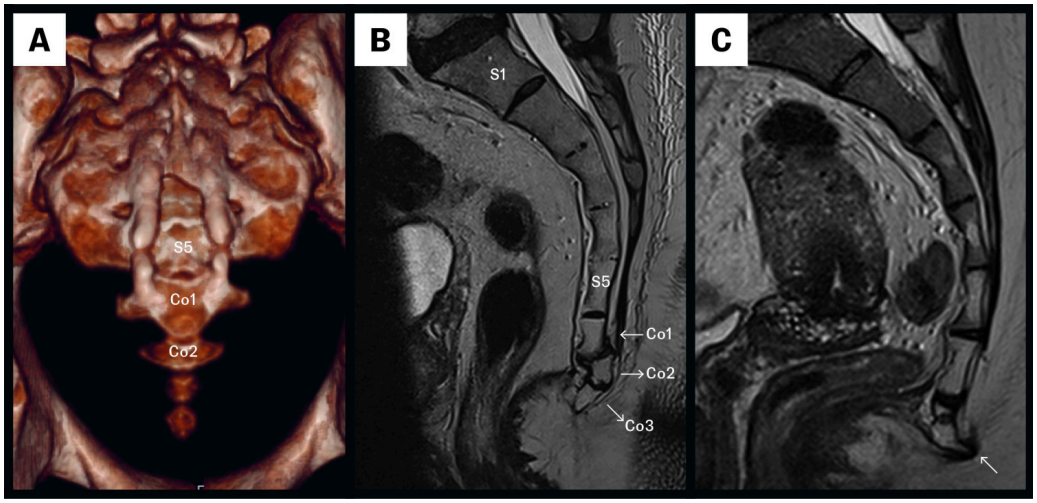

Figure 1 a) Normal findings with four coccygeal vertebrae displayed on a CT scan (anterior view with 3D reconstruction). Sagittal MRI of sacrum and coccyx shows b) dorsal subluxation of Co2 and Co3, and c) coccygeal spicule on the tip of the coccyx and fibrosis of the surrounding soft tissue (arrow).

There are two primary causes of coccydynia: hypermobility and immobility.

The average coccygeal mobility in individuals without coccydynia is 4–15° when transitioning between a standing and seated position (10). Hypermobility is defined as flexion of more than 25°. In our experience, traumatic dislocation of the coccyx typically occurs at the Co1– Co2 disc, while the dislocation is often more distal when caused by childbirth (Figure 2). The disc injury leads to inflammation, which in turn can cause resorption of the disc and possibly subluxation as a result (Figure 1b) (11).

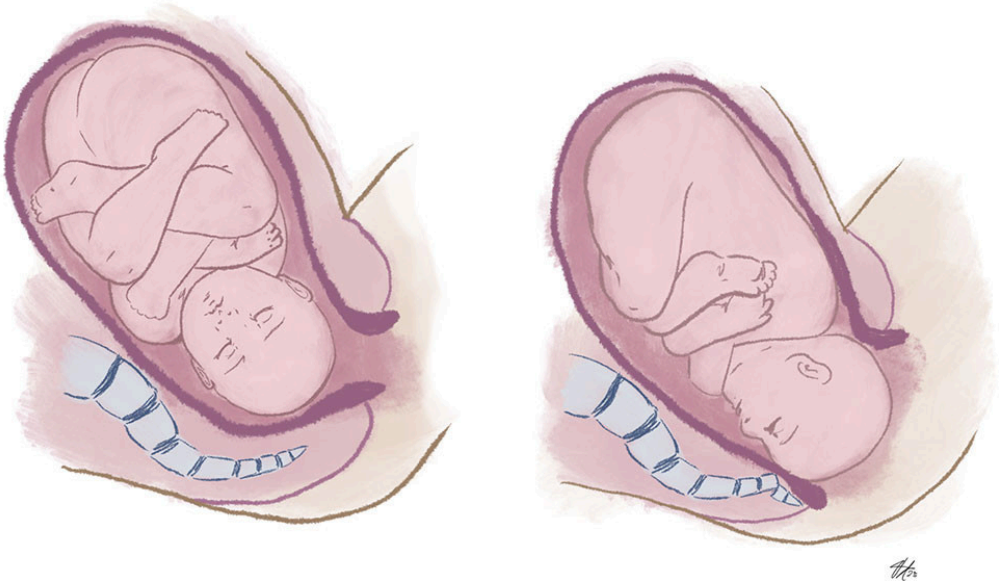

Figure 2 The illustration shows how the child's head can dislocate the lower coccygeal vertebrae during birth. Illustration: Tirild Dansdatter Thorland-Bjerkmo

An immobile coccyx, where the coccyx has less than 5° flexion, causes tenderness when pressure is applied, which worsens if there is a bone spur (spicule) on the tip of the coccyx (Figure 1c) (12).

In our experience, doctors making a referral often think that the cause of the symptoms is a coccygeal fracture, but fractures only account for 9 % of cases (13).

Symptoms

The main symptom is pain when sitting, which worsens when leaning back. As a result, patients prefer to sit in an asymmetrical position or leaning to one side to reduce the pressure and avoid pain (Figure 3), which can itself lead to secondary back pain. Most patients report that the pain briefly intensifies when moving from sitting to standing. Patients with an immobile coccyx report a feeling of 'sitting on a nail'. Many patients are unable to sleep on their back. Standing or walking rarely causes pain. Patients report coccyx pain on defecation and sexual intercourse (women) (8).

Figure 3 Photos of patients demonstrating two ways of reducing pressure on the coccyx.

Patients with chronic coccydynia may have debilitating pain, which in the worst cases can curtail their social life, reduce school or university attendance and lead to sick leave.

Clinical findings

Coccydynia is a clinical diagnosis. A case history should be taken as regards previous trauma and obstetric history. The patient's ability to sit should then be assessed, with the patient indicating the most painful area when sitting. Clinical examination should include a digital rectal examination, which can reveal other causes of pain such as haemorrhoids, prostatitis and tumours (14). Manipulation of the coccyx between the index finger in the rectum and the thumb dorsally allows assessment of the extent to which the pain is related to the coccyx. It is important to differentiate between coccydynia and other painful pelvic conditions. Prolonged pain that is found not to originate from the coccyx should lead to referral of the patient for broader multidisciplinary investigation (15).

Diagnostic imaging

Diagnostic imaging can provide vital supplementary information, but it is important to bear in mind that normal findings do not rule out coccydynia (11). X-ray imaging of the coccyx (lateral view) shows the position of the coccyx and can identify subluxation and fracture. Referral for an MRI of the sacrum and coccyx (2 mm slices) should be considered if the patient's condition fails to improve. MRI can provide information about the number of vertebrae, angulation, subluxation, fracture, disc injury and oedema. In addition, clarification can be provided regarding differential diagnoses, such as pilonidal cysts, rectal fistula, Tarlov cysts, chronic prostatitis, tuberculosis and tumours (16).

Treatment

A range of treatment options have been described, such as hot baths, shockwave therapy, transcutaneous electrical nerve stimulation, manipulation of the coccyx, injections and coccygectomy (14). As regards pharmaceutical treatment, non-steroidal anti-inflammatory drugs (NSAIDs) are useful in the acute phase following injury but are less effective for chronic coccydynia. Opiates are not advised because they can cause constipation, which could aggravate symptoms.

In the first instance, treatment of coccydynia consists of avoiding sitting on hard surfaces and for prolonged periods of time. Using a coccyx cushion with a rear cutout can reduce pain when sitting or driving.

If the pain does not subside within three months, consideration should be given to treating the patient with corticosteroid injections. Studies have demonstrated improved efficacy if injections are started within one year of the onset of symptoms (3, 17).

Adolescents are treated primarily by reduction of pressure and administration of injections, with the possibility of surgery after the age of 18 years (9).

Patients who have lived with chronic coccydynia for prolonged periods of time before receiving appropriate treatment may experience no or little improvement from corticosteroids or surgery. It is important to communicate this to the patient.

Corticosteroid injection

The corticosteroid is injected directly at the most painful area of the coccyx. The injection is simple to perform with the guidance of an index finger in the rectum (Figure 4) (18). The steroid is injected behind the Co1–Co2 disc and/or at the tip of the coccyx. If the patient is able to sit symmetrically on a hard chair and rise to standing without pain immediately after the injection, the injection has been placed correctly.

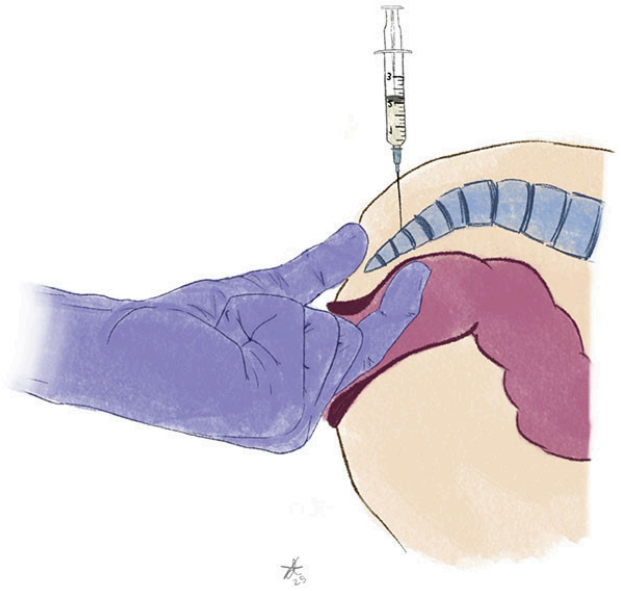

Figure 4 Injection technique with concurrent rectal palpation and index finger as a guide to the position of the coccyx. Illustration: Tirild Dansdatter Thorland-Bjerkmo

The patient is placed in the prone position, or alternatively, in a lateral or oblique lateral position. If it is not possible to reach the coccyx with the index finger, the injection can be given under X-ray fluoroscopy.

We use 6 mg betamethasone or 10–20 mg triamcinolone mixed with 1 ml local anaesthetic. Betamethasone is more water soluble, with an onset of pain relief after a few days. The efficacy of triamcinolone is better, but the onset of pain relief takes 1–2 weeks, and it is also associated with a slight risk of subcutaneous atrophy (17, 19).

If the injection gives temporary relief, it can be repeated after three months. Many patients need several injections to achieve a significant improvement in their ability to sit. Corticosteroid injections produce lasting pain relief in 29–49 % of patients (3, 17). It is safe to treat pregnant women with injections (20).

We do not administer injections at the ganglion impar, the terminal point of the sympathetic trunk that is located anterior to Co1–Co2 (16), because it requires X-ray guidance and the use of a contrast agent.

Coccygectomy

Surgery is appropriate for patients with daily debilitating pain despite conservative measures. If the patient has experienced no improvement from local anaesthesia or corticosteroids after two injections, it must be suspected that the cause of the pain is not the coccyx, and coccygectomy should not be performed in these cases.

The patient must understand that the postoperative recovery period is prolonged and that it can take a year or more before there is a significant improvement in the ability to sit.

In most patients, the surgery is performed under spinal anaesthesia, which in our experience reduces postoperative pain compared to general anaesthesia (21). We use the technique described by Key with a 4 cm midline incision (22). The mobile segment of the coccyx is removed, which is usually Co2–Co4. When the coccyx is fused, osteotomy is performed at an appropriate level below Co1. The pelvic floor is reconstructed with adaptation of the muscle and ligament attachments in the midline with interrupted sutures, followed by closure of the subcutaneous layer and the skin.

Infection is the most common postoperative complication due to the proximity to the anus (23, 24). Most infections are initially superficial and may not appear serious, but they should be treated and closely monitored to avoid deep infection. At St Olav's University Hospital, we have reduced the number of reoperations due to infection from 10 % to 2 % by extending antibiotic prophylaxis with cephalosporin and metronidazole from 24 hours to 48 hours (8).

The patient should avoid sitting for the first three weeks after surgery (25). The typical sick leave period is 3–4 months, and during this time the patient should not exercise.

Although surgery is better documented than other treatments for chronic coccydynia (14), there is a lack of randomised controlled trials. A study of 232 patients who underwent surgery using Key's technique found a success rate of 87 % (23). A prospective study of 98 patients found a successful outcome of surgery in 70 % of cases, and patients with treatment failure had a higher incidence of psychiatric disorders, pre-operative opiate use and multimorbidity (25). Our study found that 71 % of the 171 patients who underwent surgery were either completely well or much better after at least 12 months. However, 4 % reported worsened pain (8).

Summary

Patients with coccydynia should be treated with NSAIDs and by reducing pressure in the acute phase. After three months, injection treatment with corticosteroids should be considered. If treatment is initiated promptly enough, we believe that more patients can be spared unnecessary suffering and chronification of the pain. Treatment with injections can be repeated several times and results in an improved quality of life for many patients. In patients with recurrent pain, surgery can be considered if the patient is prepared for the prolonged rehabilitation.

We hope that this article can contribute to enhanced provision of treatment to this patient group, both in primary care services and in hospitals.

The patients shown in Figure 3 have consented to publication of the article.

The article has been peer-reviewed.

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