CASE REPORT

An atypical limping teenager

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SUMMARY

A 13-year-old boy presented with a 5-day history of left-sided limp of gradual onset. There was no history of trauma. He developed a fever and rigours a few days before presenting to the paediatric emergency department. On examination, he was tender on palpating the left gluteal area on active mobilisation of the left hip and could not weight bear on the left leg. Pelvic X-rays and ultrasound of the left hip were normal. The blood results showed raised inflammatory markers and normal white cell count. The blood cultures were positive for *Staphylococcus aureus*. On day 2, a left hip MRI was performed as well as CT-guided drainage. Diagnosis of left sacroiliac septic arthritis was made. After an initial lack of improvement under intravenous ceftriaxone, a drain was inserted and left in situ for 8 days with double intravenous antibiotic therapy instituted. The patient made a full recovery.

BACKGROUND

Septic sacroiliitis in children is a difficult and uncommon diagnosis, accounting for approximately 1–2% of osteoarticular infections in children. Diagnosis is often delayed because of its non-specific presentation. Its deep location makes it difficult to diagnose with usual methods. Its recognition is very important to ensure appropriate management and prevent significant mobility impairment.

CASE PRESENTATION

A 13-year-old boy, accompanied by his father, presented with a 5-day history of left-sided hip and gluteal tenderness of gradual onset, associated with fever up to 38.5°C for the past 4 days.

He had been rowing the day before he developed the pain, but denied any trauma.

On day 3, he was seen by his general practitioner (GP), who prescribed ibuprofen and paracetamol and referred him for left hip X-ray, which was normal. He was therefore sent home with crutches and a working diagnosis of muscle tear.

His condition did not improve, and when he presented to the emergency department on day 5, he was unable to weight bear on the left leg and started to develop rigours.

The only medical history of note was a left big toe cellulitis 2 weeks prior to this presentation, treated with a course of coamoxiclav by his GP.

He had no known allergies to any medications.

His immunisations were up to date. He had a 12-year-old fit and well brother.

He was living with his parents.

On examination, he was comfortable at rest but very tender on mobilisation.

There was no redness or swelling over the left hip or gluteal region. The patient was tender on palpation of the greater trochanter and gluteal area. He had a full range of passive movement. He had reduced active hip flexion of 90°, and was tender on internal rotation of the hip. No discriminatory sacroiliac joint tests, such as FABER, were performed on initial assessment.

A residual blister was noticed on the patient's left big toe with a crust on the posterior aspect. There were no physical signs of ongoing cellulitis on his foot.

The rest of the examination was unremarkable.

INVESTIGATIONS

The presence of a non-traumatic limp of acute onset, associated with fever, escalated concerns. The patient therefore underwent blood tests, which showed raised inflammatory markers (C reactive protein, (CRP) 267.5, erythrocyte sedimentation rate, 34) and normal white cell count of $8.3 \times 10^9/L$ (neutrophils $4.0 \times 10^9/L$).

A urine dipstick was positive for nitrites and leucocytes, with traces of blood, although the patient was not displaying any urinary symptoms.

Pelvic X-ray, including a frog's legs view, and a left hip ultrasound, were normal.

On day 2 of admission, a pelvic and lumbar spine MRI was organised. This showed effusions of the left sacroiliac joint measuring up to 2 cm in diameter, 3.5 cm craniocaudally, and a small pelvic effusion, associated with surrounding oedema, particularly around the left sciatic nerve, which was felt to be responsible for the posterior thigh pain. Both left and right hip joints were within normal limits (figures 1 and 2). The patient underwent CT-guided drainage of the collection on the same day, under general anaesthetic, and 2 mL of foul-smelling pus was aspirated (to dryness).

In less than 24 h, blood cultures came back positive for *Staphylococcus aureus* sensitive to ceftriaxone, flucloxacillin and clindamycin.

The culture of the drainage fluid came back, also positive for sensitive *S. aureus*.

On day 7 of admission, a repeat pelvic MRI was performed. The report showed no significant improvement. Moreover, an increase in the size of the fluid collections of the left sacroiliac joint and pelvis was observed (measuring respectively up to 3.4 cm compared with 1 cm previously, and up to 4.5 cm compared with 2.2 cm previously). There was still marked surrounding inflammatory change within the adjacent soft tissues. There was fluid and mild synovial enhancement within the left sacroiliac joint as well as adjacent periarticular bone marrow

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Figure 1 T2-weighted MRI of the pelvis in coronal view indicating effusion of the left sacroiliac joint associated with surrounding oedema suggestive of left sacroiliitis.

oedema, in keeping with sacroiliitis. This was most likely to be the source of the fluid collections.

DIFFERENTIAL DIAGNOSIS

A 14-year-old boy presenting with atraumatic limp and fever raises concern and warrants investigations to rule out potential life-threatening diagnoses such as left hip septic arthritis, acute lymphoblastic leukaemia, osteomyelitis and septic sacroiliitis. Other diagnoses must be considered, such as sickle cell crisis, juvenile-onset spondyloarthritis and referred pain.

Hence, the importance of clinical examination and historical details to lead the clinician to order the right investigations and start the appropriate treatment, as these pathologies require very different managements.

TREATMENT

A peripherally inserted central catheter line was inserted at the same time as the CT-guided drainage.

The patient was started on empirical intravenous ceftriaxone.

Figure 2 T2-weighted MRI of the pelvis in transversal view indicating effusion of the left sacroiliac joint associated with surrounding oedema suggestive of left sacroiliitis.

He then developed a rash on the anterior thigh, and was still spiking temperature up to 39.7°C, despite the intravenous ceftriaxone.

After discussion with the microbiology team, it was decided to stop the ceftriaxone and to start a combination of intravenous flucloxacillin and clindamycin.

A drain was placed on day 7 of admission after the repeat MRI and kept until day 15 of admission.

OUTCOME AND FOLLOW-UP

- ▶ The patient remained afebrile after the drain was removed. Inflammatory markers improved (CRP 28).
- ▶ He never had white cell count over $11 \times 10^9/L$.
- ▶ He was switched to oral antibiotics and discharged on day 23 of admission, to be continued for 16 days.
- ▶ He was mobilising with crutches on discharge.
- ▶ He has fully recovered since and has been able to start rowing again.

DISCUSSION

Pyogenic sacroiliitis is rare (approximately 1–2% of osteoarticular infection in children) and its diagnosis remains a challenge in paediatric patients.^{1–3} Most of the cases were reported for children aged less than 14 years.^{1–3} The identified at risk groups remain immunosuppressed patients and patients with sickle cell disease, although risk factors have been identified, such as atopic dermatitis, insect bite, folliculitis and furunculosis.^{2–3} Previous pelvic trauma² and physical effort¹ seem to be predisposing factors as well.

In our case, the patient presented with a skin cellulitis 2 weeks before and intense rowing activity in the preceding days, which could have predisposed him to this pathology.

Although the onset of disease seems to be insidious in two-thirds of patients,² our patient presented after only 5 days of symptoms, which seems to be in accordance with a recent series described by Molinos Quintana *et al.*³

Fever, unilateral hip tenderness and reduced mobility are usually key features of the history.

In all cases, clinical examination is decisive. There are various clinical manoeuvres that can help identify sacroiliac joint pathology, such as the use of the FABER test (flexion, forced abduction and external rotation), which was not initially carried out in our case.^{2–3} However, these manoeuvres are operator-dependent. Their aim is more to direct the clinician towards imaging of the sacroiliac joint rather than to discriminate between sacroiliac joint diseases.⁴

The differential diagnosis can be very broad, including septic arthritis of the hip,^{2–3} acute lymphoblastic leukaemia, osteomyelitis and sickle cell crisis. Juvenile-onset spondyloarthritis should also be considered, as it can present as a monoarthritis of the lower extremity involving the sacroiliac joint. If suspected, extra-articular manifestations such as acute anterior uveitis or subclinical inflammatory bowel disease should be sought for in history and clinical examination to help the diagnosis.

The blood tests usually show non-specific raised inflammatory markers. Hence the importance of responding to clinical red flags to escalate investigations and search for a definitive diagnosis.

Blood cultures can be helpful in providing information on the responsible pathogen, the most common being *S. aureus*, accounting for 80% of pyogenic sacroiliitis.^{2–3}

Interestingly, our patient presented a positive urine dipstick for nitrates, blood and leucocytes of unclear significance. The association with sacroiliitis is unclear and has not been

mentioned in previous case reports. This could be a confusing factor responsible for diagnosis delay, and worth mentioning.

MRI seems to be the imaging technique of choice for diagnosis confirmation, providing the highest sensitivity and specificity (respectively, 95% and 100%).^{1–3}

Conservative management is usually sufficient and there is good response to intravenous antibiotics. The length of treat-

ment seems to be consensual with 3 weeks of intravenous therapy followed by 3 weeks of oral therapy.

Although invasive procedures (such as CT-guided drainage) are not routinely recommended,^{2,3} the absence of response to initial broad spectrum intravenous antibiotherapy in our patient was felt to be a good indication for joint aspiration on day 2, to identify the likely pathogen.

Close observation and monitoring of treatment response with regular MRI and blood tests, in order to implement appropriate management in case of poor response to initial therapy, is critical to ensure prevention of complications, which can result in significant functional impairment.

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Competing interests None declared.

Patient consent Obtained.

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Learning points

- Rare pathology that can lead to significant functional impairment if unrecognised.
- Importance should be given to history taking and specific examination to identify sacroiliac joint involvement (ie, flexion, forced abduction and external rotation, FABER test).
- Blood tests should be performed to show non-specific inflammatory response.
- There is potential confusion from positive urine dip stick results.
- MRI is the preferred diagnostic imaging technique.
- There is usually a good response to intravenous antibiotics.
- Long term prognosis is good overall if septic sacroiliitis is recognised and treated early.

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