

Sacroiliac joint infection

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ABSTRACT

Sacroiliac joint infection is a rare condition. It is frequently missed and the diagnosis is often delayed. Clinical features are non-specific and range from back pain to hip or thigh pain. Fever may be absent. The diagnosis is established by the use of magnetic resonance imaging. The infection responds well to medical therapy. The prognosis is usually good. Surgical treatment includes debridement and occasionally arthrodesis. Two contrasting cases of unilateral sacroiliac joint infections are presented to highlight the clinical and radiological features of this condition. The patients presented are a 19-year-old male with pyogenic sacroiliitis and a 16-year-old female with tuberculous sacroiliitis. Both responded well to medical therapy and did not require surgical treatment.

Keywords: Sacroiliitis, sacroiliac joint infection, pyogenic, tuberculous, magnetic resonance imaging

INTRODUCTION

The sacroiliac joint (SIJ) is a unique joint. It has fibro and hyaline cartilages with discontinuity of the posterior capsule and uneven articular surfaces, with many ridges and depressions, to minimise movement and enhance stability. ¹ It is however, a true diarthrodial joint as it has matching articular surfaces separated by a joint space containing synovial fluid and enveloped by a fibrous capsule. ¹ Pyogenic SIJ infection makes up approximately 1-2% of cases of all septic arthritis or bone infections. ² Tuberculous SIJ infection accounts for 10% of all skeletal tuberculosis. ³ The risk factors for SIJ infections include intravenous drug abuse, immunosup-

pression, pregnancy, trauma and infection from other sites in the body. ⁴ We report two unique cases of unilateral infective sacroiliitis to highlight the differences in the presentation, imaging and management between pyogenic and tuberculous sacroiliitis.

CASE REPORT

CASE 1: A 19-year-old man presented with acute onset of left hip and buttock pain following a sport injury. His pain was sharp in nature which subsequently worsened and affected his ability to walk. The pain was rated as 9/10 on the Visual Analogue Score (VAS) on admission. He developed high-grade fever around the same time, with no obvious foci of infection. On physical examination, he had a temperature of 39.4°C. He demonstrated a limitation of straight-leg raising (SLR) on the left side and a reduction of active movement

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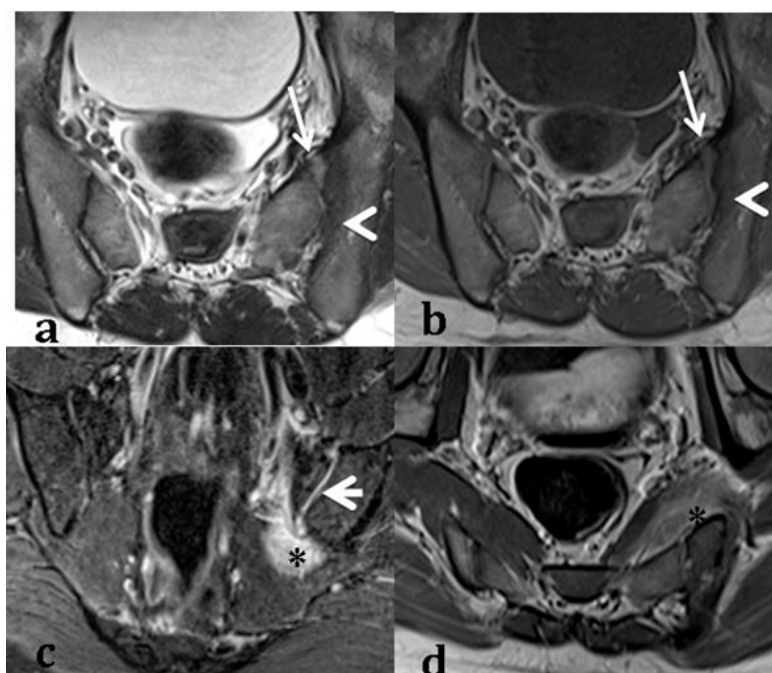
of the left hip. The FABER (Flexion Abduction External Rotation) test was positive for the left side. Muscle power for left hip flexion and knee extension was limited due to pain. The neurological examination was otherwise unremarkable.

Laboratory investigations revealed a total white cell count (WCC) of $9.0 \times 10^9/L$ (Normal range 4-11), a raised erythrocyte sedimentation rate (ESR) of 87 mm/hr (<10) and an elevated C-reactive protein (CRP) level of 7.63 mg/dl. Plain radiographs of the lumbosacral region and pelvis did not show any fracture or lytic lesions.

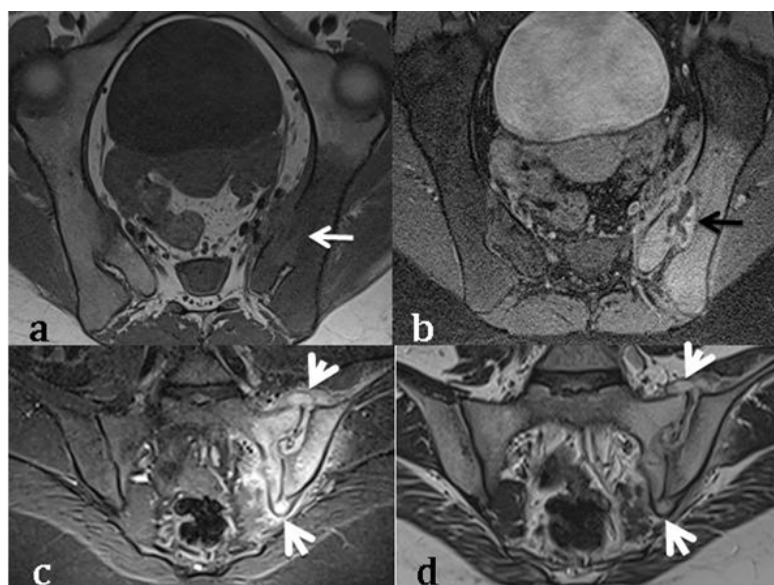
The initial working diagnosis was a herniated disc with a concurrent infection and he was managed accordingly. The patient was asked to rest in bed and appropriate analgesia was prescribed. At the same time, a septic work-up was being carried out. Cultures of the blood, urine and sputum did not grow any micro-organism after 72 hours.

A contrast-enhanced Magnetic Resonance Imaging (MRI) study of the lumbar spine and pelvis revealed the presence of fluid within the left SIJ, with destruction in the subchondral bone (Figures 1a-d). There was an adjacent ring-enhancing collection that caused the left piriformis to bulge medially. The left piriformis muscle was swollen and demonstrated hyperintense signal within, consistent with inflammation or oedema. Parts of the bony sacrum and ilium that were adjacent to the left SIJ showed features of marrow oedema. The collection did not extend into the sacral foramen. There was minimal ascites seen within the pelvis. A Computed Tomography (CT)-guided fine needle aspiration of the joint could not be performed due to the small size of the collection and poor window.

The patient responded favourably to antibiotic therapy. He was treated with an eight-week course of amoxicillin-clavulanate and fusidic acid. The pain score reduced to a VAS of 3/10 and the CRP showed a declining



Figs. 1: Magnetic resonance imaging of the sacro-iliac joint (SIJ); a) Axial T2W and b) T1W images showing erosion of the left SIJ (arrow) with subchondral oedema at the iliac side of the SIJ (arrowhead), c) Coronal STIR and, d) axial T1W post-gadolinium images showing thick inflammatory phlegmon with small liquefied abscess (asterisk) extending antero-inferiorly from the left SIJ (arrow).



Figs. 2: Magnetic resonance imaging of the sacro-iliac joint (SIJ); a) Axial T1W image shows widening and erosion of the left SIJ with marked surrounding marrow oedema (arrow), b) Axial T1W post-gadolinium image shows left SIJ collection with thick synovial enhancement (arrow), c) Coronal STIR and, d) T2W images showing the collection of left SIJ extends superiorly and inferiorly (arrows), associated with marrow oedema in both ilium and sacrum.

trend. He was able to ambulate with walking aid after several days of antibiotics. He was discharged with antibiotics and analgesia after 12 days of hospitalisation. Nine weeks later, he was ambulating pain-free during his follow-up appointment. He did not experience any residual symptoms. His CRP level on follow-up was 0.1 mg/dl and WCC was $7.3 \times 10^9/L$.

CASE 2: A 16-year-old female presented with an insidious onset of low back pain radiating to her left lateral aspect of the knee for seven months duration. The pain was rated as 8/10 using the VAS and this was reduced to 6/10 with analgesia. The pain was associated with numbness of the entire left lower limb. There was no history of trauma. She did not have any fever. She did however, have significant weight loss of six kg over three months. She did not have chronic cough or close contact with anyone suspected of having tuberculosis. She sought treatment from several doctors, who prescribed analgesia but her condition did not improve. Upon physical examination, she was not septic-looking. Her temperature was

37°C. She was unable to actively flex her left hip. The FABER test was positive for the left side. She had difficulty with walking. The neurological examination was unremarkable.

Laboratory investigations revealed a WCC of $8.6 \times 10^9/L$, ESR of 120 mm/hr and CRP level of 1.92 mg/dl. The Mantoux test was positive after 72 hours. Plain radiographs of the lumbosacral region and pelvis did not show any fracture or lytic lesions. MRI of the pelvis revealed a collection at the left sacroiliac joint that was thought to be either pyogenic or tuberculous in origin (Figures 2a-d). CT-guided biopsy was done. The specimen was positive for acid-fast bacilli. She was diagnosed to have tuberculous infection of the left SIJ.

She was started on anti-tuberculous chemotherapy. Following treatment, the pain markedly reduced to VAS of 4/10. ESR: 98 mm/hr, WCC: $5.9 \times 10^9/L$, CRP: 0.95 mg/dl. Her condition improved over the next few months and resolved after four months. She

completed the course of medication for a year.

DISCUSSION

The diagnosis of SIJ infection is difficult and often challenging. There is no hallmark clinical feature that are diagnostics. The symptoms sometimes are non-specific. The first patient experienced left buttock pain radiating down the thigh in an acute setting. The second patient had a more insidious onset of low back pain and had seen several doctors before the diagnosis was confirmed. The most frequent clinical feature is lumbar or gluteal pain. The presence of fever is variable. Hermet *et al.* reported fever in 41% of their series of 39 cases of pyogenic sacroiliitis.⁵

Early recognition of SIJ infection is important because delayed diagnosis may result in increased morbidity due to the pain suffered by the patient. Blood investigations may show elevated ESR. Kim *et al.* reported that in their series of 16 patients with SIJ tuberculosis, all had elevated ESR.⁶ Hermet *et al.* reported raised CRP and ESR in all their patients but only 46.8% had leukocytosis.⁵

Imaging tools are useful to aid the clinician in terms of diagnosing the infection. MRI is a sensitive modality in the early diagnosis of septic sacroiliitis.⁷ Sandrasegaran *et al.* noted that in their series of five patients with septic sacroiliitis, sacroiliac joint effusions, bone oedema and adjacent inflammation were seen as high signal on short-tau inversion recovery (STIR) and T2-weighted images, while in two cases, abscesses were seen as rim-enhancing lesions anterior to the joint on gadolinium-enhanced T1-weighted images.⁸

It is however, rather challenging, to differentiate between septic and tuberculous sacroiliitis on MRI. Hong *et al.* reported that in their series of 42 patients, those with pyogenic arthritis had a significantly larger percentage of marrow signal intensity abnormalities than did patients with tuberculous arthritis.⁹ They found that the presence of bone erosion and absence of marrow signal intensity abnormality favoured a diagnosis of tuberculous arthritis rather than pyogenic.⁹

Imaging of the abscess wall provided the most useful information in the differentiation of tuberculous arthritis and pyogenic arthritis. Well-defined tuberculous abscesses had thin and smooth walls while pyogenic abscesses had thick and irregular walls.⁹

Hermet *et al.* reported that in 48.1% of their cases, the infection had spread to the surrounding muscles.⁵ However, they reported that most of their patients (94.9%) responded to antibiotic therapy, which were either started empirically or based on culture and sensitivity reports.⁵ The most common organism isolated was methicillin sensitive *Staphylococcus aureus* and the duration of antibiotic therapy ranged from two to 34 weeks.⁵ In contrast, Kim *et al.* reported that 75% of their patients with tuberculous sacroiliitis required surgery.⁶ All their patients were started on anti-tuberculous chemotherapy. The duration of the chemotherapy varied from 22 to 24 months.⁶ In both of our cases, surgery was not required and medical therapy was adequate to treat the infections.

In conclusion, SIJ infections are rare. Clinical presentations may vary and mimic non infective lumbar spine pathology. MRI is

the gold standard modality to detect this condition.

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