

Septic Sacroiliitis: A Diagnostic Challenge for the Clinician

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An infection of the sacroiliac joint (septic sacroiliitis) is relatively uncommon and comprises approximately 1% of all joint infections [1]. Usually unilateral with a left predominance, this condition is more common among children and adolescents [2]. Risk factor such as pelvic trauma, pregnancy, intravenous (IV) drug usage, immunosuppression, and recurrent infections have been reported in about two-thirds of patients. Common symptoms such as fever, lower back pain, and gluteal pain are non-specific and may be misleading [3]. Pelvic magnetic resonance imaging (MRI) is the standard of reference for diagnosing sacroiliitis. A long course (about 4–6 weeks) of

IV antibiotics is considered an acceptable therapy regimen [2,3].

PATIENT DESCRIPTION

A 23 year old male with an unremarkable medical history was admitted to the emergency room with no ability to stand and bear weight on his legs. The chief complaint was left low back pain lasting 1 day. The patient had no history of pelvic trauma or IV drug abuse. His vital signs showed 38.4°C fever with chills, while maintaining normal heart rate and blood pressure. His physical examination revealed pain on palpation laterally to the left sacroiliac joint (SIJ) without local swelling, heat, or erythema. He tested positive for a left flexion, abduction, and external rotation (FABER) test and negative for a straight leg raising (SLR) test bilaterally without any neurological deficit. Laboratory results showed a mild leukocytosis of 12,600 cells/ μ L and an increased C-reactive protein (CRP) level of 60.9 mg/L (normal < 5 mg/L). Serology

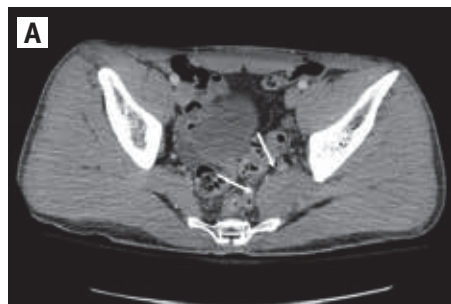
testing was negative for both brucellosis (Rose Bengal Test) and IgM-CMV (cytomegalovirus, ELISA). *Streptococcus mitis* was cultured from the blood, followed by two additional blood cultures 18 hours later without bacterial growth.

Initial radiological investigation included an unremarkable pelvis X-ray, left hip ultrasound, and pelvic computed tomography (CT) scan that demonstrated asymmetry of the piriformis muscles with an increased size of the left piriformis muscle [Figure 1A]. These results were interpreted as an early sign of infection, potentially involving the left SIJ despite no apparent SIJ pathology.

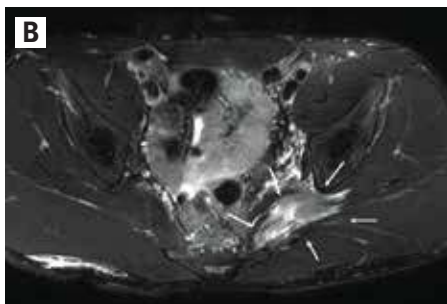
Further evaluation during his hospitalization in the department of orthopedic surgery included a pelvic MRI [Figure 1B, Figure 1C] performed on the day of admission. Soft tissue edema anteriorly and posteriorly to the left SIJ and swelling of the regional muscles was demonstrated with no evidence of a pyogenic abscess. The left piriformis muscle was edematous.

Figure 1.

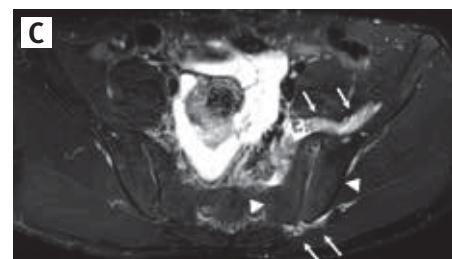
[A] Pelvic computed tomography showing axial image of a patient with left gluteal pain and inability to stand or bear weight on his legs, on admission. Significant enlargement of the left piriformis muscle (arrows) compared to the right side, suspected to represent muscle infection



[B] Pelvic magnetic resonance imaging at hospital admission showing T2-weighted, fat-suppressed axial image at the level of the piriformis muscles of a patient with left gluteal pain and inability to stand or bear weight on his legs, on admission. Edema of left piriformis muscle (arrows) compatible with muscle infection



[C] Pelvic magnetic resonance imaging at hospital admission showing T2-weighted, fat-suppressed axial image at the level of the sacroiliac joints of a patient with left gluteal pain and an inability to stand or bear weight on his legs, on admission. Soft tissue edema (arrows) anteriorly and posteriorly to left sacroiliac joint (arrowheads) suggesting a joint infectious process, despite no clear involvement of the sacroiliac joint



[D] Pelvic magnetic resonance imaging (MRI) showing T2-weighted, fat-suppressed semi-coronal image of a patient with left gluteal pain and an inability to stand, on admission, performed 2 weeks after the first MRI. Significant left iliac (arrows) and somewhat sacral-sided (arrowhead) bone marrow edema compatible with sacroiliitis. Soft tissue edema evident on previous MRI is almost entirely resolved



Findings were interpreted as early septic sacroiliitis despite the fact that neither MRI nor CT scans demonstrated involvement of the SIJ itself. Treatment with intravenous antibiotics and anti-inflammatory drugs was initiated less than 24 hours after hospital admission. The patient was discharged after 10 days with minimal improvement in symptoms. Laboratory inflammation markers were almost in the normal range. He completed a 4 week regimen of 2 gram IV ceftriaxone through a peripherally inserted central catheter (PICC line).

A 2 week follow-up MRI examination of the sacroiliac joints showed a significant subchondral iliac-sided marrow edema with only slight evidence of sacral-sided marrow edema as well as an increased amount of fluid in the joints, which is compatible with sacroiliitis [Figure 1D]. An improvement of the periarticular soft

tissue involvement compared to the previous MRI examination was noticed.

In a clinical follow-up 5 weeks after admission, the patient did not have any pain and was medication free. He reported a significant improvement in general health including regaining the ability to stand and bear weight on his legs.

COMMENT

Septic sacroiliitis is considered to be a diagnostic challenge for the primary physician. Since 1878, the literature regarding this infection consists mainly of case reports and small-scale case series [1-3]. The mean time to diagnosis in one review was 43.3 days [3]. This delay is best explained by the non-specific and misleading symptoms with a wide differential diagnosis, including spinal disk herniation, discitis, musculoskeletal injury, nephrolithiasis, or non-infectious inflammatory arthritis [3].

The most commonly described pathogen for septic sacroiliitis is *Staphylococcus aureus* with a hematogenous spread mechanism. However, in 27–40% of cases, no bacteria is detected in cultures. Different types of antibiotic regimens have been reported ranging from 2 up to 46 weeks. However, in practice, parenteral treatment usually lasts 4 to 8 weeks [2].

Imaging is the major diagnostic method for identifying sacroiliitis. While conventional radiography is mostly unremarkable, skeletal scintigraphy can detect the infected joint after 48 hours, although non-specific. Widening of the SIJ, erosions, soft tissue swelling, and abscess formation were all described on CT scans of patients with septic sacroiliitis. MRI, a non-ionizing radiation technique, is more sensitive and may detect subtle changes before they are seen on a CT. These changes may include periarticular bone marrow edema and

swelling or abscesses of the adjacent soft tissues [4,5].

In our case report, despite ambiguous clinical and initial laboratory tests, due to high clinical index of suspicion and the use of advanced imaging modalities, a prompt diagnosis in less than 24 hours was performed, which allowed for immediate intervention. The bacteria that grew in only one blood culture was considered a skin contamination rather than a true bacteremia. Rapid initiation of antibiotic treatment led to a relatively quick recovery and potentially spared the patient complications, such as abscess formation and septic shock, which may have required surgery.

CONCLUSIONS

Septic sacroiliitis is a relatively uncommon condition with a relatively delayed diagnosis due to ambiguous and non-distinctive symptoms. This reported case highlights the importance of high clinical index of suspicion and properly targeted imaging to establish early diagnosis and appropriate treatment.

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“The worthwhile problems are the ones you can really solve or help solve, the ones you can really contribute something to. No problem is too small or too trivial if we can really do something about it”

Richard Feynman, (1918–1988), Nobelauriate in physics. American theoretical physicist known for his work in the path integral formulation of quantum mechanics, the theory of quantum electrodynamics, and the physics of the superfluidity of supercooled liquid helium, as well as in particle physics