Case 8494

Septic sacroiliitis
Published on 29.07.2010

DOI: 10.1594/EURORAD/CASE.8494
ISSN: 1563-4086
Section: Musculoskeletal system
Case Type: Clinical Cases
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Patient: 39 years, female

Clinical History:

We present the case of a 39 year old female with a history of longstanding intravenous drug use presented with lower back pain and fever. Examination reveals focal tenderness over the right sacroiliac joint. The patient was imaged on initial presentation, and was lost to follow-up. The patient re-presented 10 months later and was re-imaged.

Imaging Findings:

Initial frontal radiograph of the pelvis (Fig. 1) on admission demonstrates no obvious abnormalities. MRI of the lumbar spine was performed several days later (Fig. 2). An abnormal 2.4 x 1.5 cm peripherally-enhancing fluid collection is present within the right iliacus adjacent to the SI joint. There is additional enhancement of the marrow of the sacrum and right ilium adjacent to the SI joint.

CT of the lumbar spine and sacrum performed a few days later (Fig. 3) also demonstrates the peripherally-enhancing fluid collection. No widening, erosions, or areas of sclerosis are seen in the adjacent right sacroiliac joint.

Ten months later, the patient re-presented to the hospital with similar symptoms. Frontal radiograph of the lumbar spine and pelvis (Fig. 4) shows new widening and sclerosis of the right sacroiliac joint.

Subsequent CT scan of the pelvis a week later demonstrates areas of bone resorption, sclerosis, and irregularity of the right sacroiliac joint (Fig. 5).

Nuclear medicine bone scan with Technetium 99-m medronate demonstrates increased radionuclide uptake within and around the right sacroiliac joint (Fig. 6). This is consistent with sacroiliitis.

A CT-guided right sacroiliac joint aspiration (Fig. 7) was subsequently performed. No growth was obtained, although patient had multiple blood cultures positive for Staphylococcus aureus.

Discussion:

Pyogenic sacroiliitis constitutes only 1.5-10% of all sacroiliac joint conditions, but merits a high index of suspicion since the prognosis depends on early diagnosis and treatment [1]. Underlying risk factors [1,2] include: intravenous drug use, immunosuppression, endocarditis, other underlying infections or bacteremia, pregnancy [5], sickle cell disease, and prior trauma of the joint.

The clinical presentation is non-specific, but includes fever, antalgic gait, and buttock or lower back pain [2]. Unfortunately, diagnosis is often delayed secondary to the rarity of the disorder, wide variety of clinical presentations, and low clinical suspicion [3,4]. The differential diagnosis includes seronegative inflammatory
arthropathies, or post-traumatic sacroiliitis.

Among pyogenic sacroiliitis, greater than 80% of reported cases are caused by gram-positive organisms [2], with Staphylococcus aureus accounting for up to 78% [1]. Pseudomonas aeruginosa has been reported in intravenous drug users [2,3] and immunosuppressed patients [2]. Escherichia coli is usually seen in patients with urinary tract infections [2]. Other causative organisms [1,2] include Streptococcus, Escherichia coli, Salmonella, Serratia, Klebsiella, Neisseria gonorrhoeae, and Mycobacterium tuberculosis [7].

Pathogenesis is usually from haematogenous dissemination of infection from a primary focus [1,2]. Less frequent causes include extension from intraabdominal, retroperitoneal, or gluteal abscesses, and direct invasion from surgical procedures or joint aspiration [1].

The earliest radiologic sign is slight widening of the joint space [2], followed by irregularity, sclerosis, or cortical disruption of the iliac side of the joint. However, radiographic changes are typically a late finding, with two-thirds of the initial radiographs being negative [1]. Although CT could be helpful in evaluating osseous and soft tissue abnormalities, early morphological changes of the sacroiliac joint often remain undetectable [1,6,9]. CT is useful in guiding joint aspiration [2,4].

Nuclear medicine bone scan is a very sensitive early diagnostic tool, demonstrating unilateral increased uptake within 24-48 hours of the onset of symptoms [1]. However, specificity is low for septic sacroiliitis [4,5].

MRI is also very sensitive in the early diagnosis of septic sacroiliitis, secondary to its ability to detect surrounding bone marrow oedema, fluid in the sacroiliac joint, and soft tissue abscesses [1,2,8]. MRI is also better than CT in the evaluation of cartilage integrity and detection of osseous erosions [2].

If the diagnosis of septic sacroiliitis is considered but the blood culture is negative, sacroiliac joint aspiration could be performed for definitive diagnosis or identification of the organism. However, cultures of sacroiliac joint fluid obtained either surgically or percutaneously with CT guidance are only positive in 50-88% of the cases, while positive blood cultures are only reported in 23-67% of the cases [2].

Intravenous antibiotics (4 to 8 weeks) are the first-line treatment [2]. Surgical management is considered if there is failure of antibiotics therapy, or if abscess formation is present [1,2]. Drainage can be performed via image-guided percutaneous techniques, with open surgical techniques required for debridement [1]. Following eradication of the infection, surgical arthrodesis of the sacroiliac joint can be performed for patients with intractable pain [1].

**Differential Diagnosis List:** Septic Sacroiliitis

**Final Diagnosis:** Septic Sacroiliitis

**References:**

Description: No obvious abnormalities seen on this radiograph from the initial presentation. Origin:
Description: Bone window at level of S1: No obvious osseous or joint space abnormalities. Origin:
Description: Bone window at level of S2: No obvious osseous or joint space abnormalities. Origin:
Description: Bone window with coronal reformat: No obvious osseous or joint space abnormalities.

Origin:
Description: Soft tissue window: 2.5 x 1.7 cm peripherally enhancing fluid collection in the right iliacus muscle. Origin:
Description: Repeated radiograph 10 months later demonstrates widening of the right sacroiliac joint, with irregularity and increased density along the iliac side of the joint. These findings were not seen in the prior radiograph (Fig 1). Origin:
Description: Repeated radiograph 10 months later demonstrates widening of the right sacroiliac joint, with irregularity and increased density along the iliac side of the joint. These findings were not seen in the prior radiograph (Fig 1). Origin:
Description: Bone window at level of S1: Areas of bone resorption, sclerosis, and irregularity of the right sacroiliac joint. These findings were not seen in the prior CT (Fig 3a). Origin:

Description: Bone window at level of S2: Areas of bone resorption, sclerosis, and irregularity of the right sacroiliac joint. These findings were not seen in the prior CT (Fig 3b). Origin:
Description: Bone window with coronal reformat: Areas of bone resorption, sclerosis, and irregularity of the right sacroiliac joint. These findings were not seen in the prior CT (Fig 3c). Origin:
Figure 5

Description: Tc-99m bone scan showing increased radionuclide uptake adjacent to the right sacroiliac joint. Origin:
Description: CT confirming intra-articular positioning of the needle tip prior to aspiration. Origin:
**Figure 7**

*Description:* T2 weighted image: 2.4 x 1.5 cm hyperintense lesion (long arrow) in the right iliacus muscle. In addition, the right sacroiliac joint is hyperintense on T2 weighted (short arrow) and hypointense on T1 weighted sequence (figure 2b), consistent with joint fluid. *Origin:*
Description: T1 weighted image post-gadolinium with fat saturation: The right iliacus lesion (long arrow) is shown to be a peripherally-enhancing fluid collection. This is consistent with an abscess.

There is also marrow enhancement of the sacrum and ilium adjacent to the right sacroiliac joint, consistent with osteomyelitis. Origin: