
CASE REPORT

Pyogenic Infection of the Sacroiliac Joint Complicated by Iliacus Abscess in a Paediatric Patient

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ABSTRACT

Pyogenic sacroiliitis is a rare disease entity, comprising only 1% to 2% of cases of osteomyelitis and septic arthritis. Clinical symptoms and signs are usually non-specific and may result in delayed diagnosis. This report is of a 15-year-old girl with pyogenic sacroiliitis and iliacus abscess without any predisposing factors. Various imaging modalities, including computed tomography and magnetic resonance imaging, were performed. The diagnosis was confirmed by magnetic resonance imaging and the patient was treated successfully. This patient illustrates the importance of high clinical alertness and the use of magnetic resonance imaging for confirming the diagnosis.

Key Words: Arthritis; Magnetic resonance imaging; Pediatrics; Sacroiliac joint

INTRODUCTION

Acute pyogenic sacroiliac joint infection is rare. Only 1% to 2% of osteomyelitis and septic arthritis involve the sacroiliac joint,¹⁻³ and are primarily reported to occur in children.⁴

Predisposing factors include history of intravenous drug abuse, pelvic inflammatory disease, pregnancy,⁵ trauma, and infection. However, more than 40% of patients have no predisposing or associated factors identified.^{3,6} Accurate diagnosis of patients without predisposing factors may be difficult. This report is of a 15-year-old girl with pyogenic sacroiliitis and iliacus abscess without any predisposing factors.

CASE REPORT

A 15-year-old girl presented to the accident and emergency department with fever and left hip pain for 3 days in 2006. She had no history of trauma and there was no evidence of drug abuse. At physical examination, her general condition was good, although she had a

temperature of 38.5°C. She had tenderness over the left gluteal region. Her left hip had a limited range of movement due to pain. The Patrick test and femoral stretch test were positive. There were no other respiratory or gastrointestinal symptoms and signs. The white blood cell count was 12.1 x 10⁹/L (normal range, 4.5-11.0 x 10⁹/L) and C-reactive protein (CRP) was 190.1 mg/L (normal range, 0-80 mg/L). The erythrocyte sedimentation rate (ESR) was 102 mm/hour (normal range, 0-20 mm/hour). Fasting blood glucose was normal. Pregnancy test was negative. Radiographs of the pelvis and left hip were unremarkable. Blood culture was negative.

Left hip arthritis was suspected and urgent ultrasound of the hip was performed, which did not reveal any effusion. Due to persistent pain and fever, computed tomography (CT) of the abdomen and pelvis were performed on day 3 after admission. CT showed mild thickening of the left iliacus muscle without definite abscess formation (Figure 1). No bony abnormality or erosion was observed in the sacroiliac joints.

Magnetic resonance imaging (MRI) of the pelvis was performed on day 4 after admission. MRI revealed high-signal intensity in the left sacroiliac joint and adjacent iliacus on short tau inversion recovery (STIR) images and low signal intensity on T1-weighted images (Figures 2 and 3). After intravenous gadolinium (Gd-DTPA)

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Figure 1. Computed tomography scan of the sacroiliac joints showing no bony abnormalities.

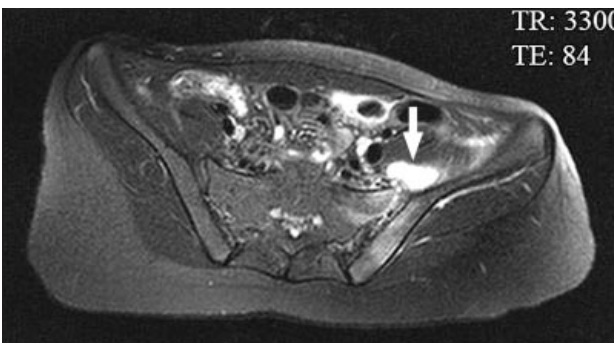


Figure 2. T2-weighted (short tau inversion recovery) magnetic resonance image showing increased T2 signal intensity over the left sacroiliac joint and the left iliacus muscle. Loculated fluid collection (hyperintense in T2) was noted anterior to the left sacroiliac joint (arrow).



Figure 3. T1-weighted magnetic resonance image showing decreased T1 signal intensity over the left sacroiliac joint (arrow).

injection, a rim-enhancing collection in the left iliacus, extending to the sciatic notch, was demonstrated (Figure 4), compatible with a left iliacus abscess communicating with the sciatic notch and sacroiliitis.

The diagnosis of sacroiliitis complicated by left iliacus abscess was established. Incision and drainage of the left iliacus abscess was performed by an orthopaedic surgeon

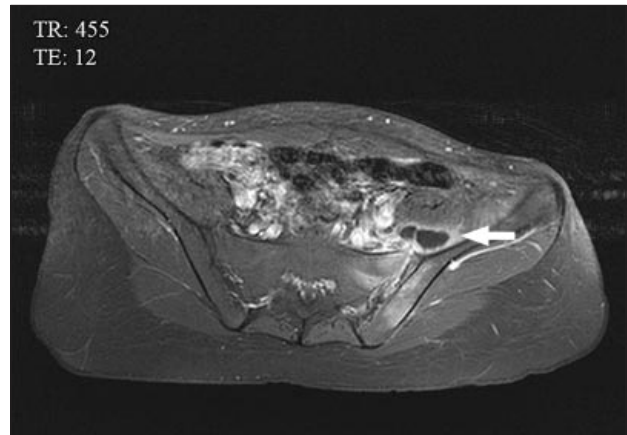


Figure 4. T1-weighted gadolinium-enhanced image showing rim-enhancement of the left iliacus collection compatible with an abscess (arrow).

under general anaesthesia, and 15 mL of pus was drained. *Staphylococcus aureus* sensitive to cloxacillin was cultured from the pus.

The patient was given appropriate antibiotics and her symptoms improved after operation. She became afebrile. White blood cell count was normalised. CRP decreased to 6.2 mg/L 11 days after operation. The patient was discharged with oral cloxacillin for 6 weeks. Follow-up was uneventful and there was no residual morbidity.

DISCUSSION

Pyogenic sacroiliitis in children is rare.^{1,2} The condition is usually initially overlooked because of the poorly localising initial symptoms, lack of awareness by clinicians, relative rarity of the disorder, and inadequate physical examination.⁷

Unilateral involvement is the rule for pyogenic sacroiliitis. Localised tenderness over the sacroiliac joint is usually present but is usually not examined initially.⁸ The Patrick or FABER (Flexion, ABduction, External Rotation) tests are positive when the pelvis is held firmly against the examination table, if the ipsilateral lateral malleolus of the supine patient is placed on the opposite knee, and the ipsilateral knee forcibly depressed causing pain at the affected sacroiliac joint.⁹ The surgeon elicited positive findings for the Patrick test and femoral stretch test in this patient.

The clinical presentation of sacroiliitis is usually non-specific, consisting of signs and symptoms that could point to other sites of the body and resemble more common conditions. The lumbosacral trunk, superior gluteal nerve, and obturator nerve cross anteriorly to

the sacroiliac joint. Irritation of these structures causes pain radiating to the lower limb, which can mimic sciatica. Irritation of the iliopsoas muscle can cause hip pain and mimic hip infection. In 10% of patients, there may be disruption of the anterior capsule of the sacroiliac joint, resulting in peritoneal irritation and presenting as an acute abdomen.¹⁰ ESR and CRP may be raised, but these signs are non-specific.

Radiographs of the hip are usually not informative in the first 2 weeks of the disease.⁵ With time, there will be loss of subchondral cortex and widening of the joint, especially at the anteroinferior part. Loss of joint cartilage and ankylosis can occur as late sequelae. Ultrasound is useful to exclude hip effusion. Technetium-99m methylene diphosphonate bone scan is helpful to detect bone and joint sepsis, as normal sacroiliac joints have a high uptake. Increased activity of unilateral infection may be difficult to discern in the early course of the disease, although there is increased perfusion over the sacroiliac joint at the blood pool phase. This finding may be absent if tested too early,² is non-specific, and cannot differentiate a psoas or gluteal abscess or identify the spread of infection from the joint into the surrounding tissues. Gallium-67 citrate has been reported to be accurate and can show sacroiliitis earlier than bone scan.¹¹ However, the technique is complicated and colonic uptake decreases the scan sensitivity.

CT scan of the sacroiliac joint is helpful for identifying soft-tissue swelling, abscess formation, bony erosion, and extent of infection. However, myositis or immature abscesses may not be readily identified by CT, especially if the early abscess or inflammatory mass is isodense and lacks ring enhancement. Subtle enlargement of muscle may be the only clue, but this is also not specific. In this patient, only mild thickening of the iliacus was observed on CT scan. Bone changes may also not be obvious on CT scan during the early course of the disease.

MRI is the most sensitive modality for diagnosing sacroiliitis.^{8,12-14} MRI can evaluate cartilage integrity, ligaments, and detect osseous oedema and erosion. MRI findings include decreased signal intensity on T1-weighted spin echo scans and increased signal intensity on T2-weighted fast spin echo or STIR scans at the affected sacroiliac joints, adjacent bone marrow of the sacrum and/or ilium, and in the iliopsoas muscle. Tracking of fluid posterior to the iliopsoas muscle is considered specific for septic sacroiliitis.¹⁴

STIR images are sensitive for demonstrating bone oedema adjacent to the infected joint. Axial T2-weighted fast spin echo scans demonstrate small joint effusions and adjacent muscle inflammation as a high-signal region. Use of intravenous Gd-DTPA contrast enables identification or exclusion of an abscess. In this patient, an iliacus abscess was identified on MRI scan. The disadvantage of MRI is that when there is only abnormal signal intensity affecting the bone marrow, MRI may not readily discriminate osteomyelitis, reactive oedema, post-operative changes, accidental trauma, and neoplasia.¹⁵

Fine-needle aspiration biopsy of the sacroiliac joint or open biopsy may be needed to yield the causative organism. If there is abscess formation, percutaneous drainage or open drainage should be done. The most common organism causing haematogenous peripelvic abscesses is *S aureus*, which accounts for 70% to 90% of cases.^{3,16} A known source of bacteria is identified in approximately half of the patients. The standard treatment is antibiotics for 4 to 6 weeks.

A delay in diagnosis can result in increased abscess size and dissemination of infection. Joint destruction and chronic debilitation are possible sequelae.

Pyogenic sacroiliitis is an uncommon condition that is usually not diagnosed promptly. A high index of suspicion is required. Pyogenic sacroiliitis should always be included in the differential diagnosis of any patient with fever who has low back and buttock pain. Radiographs and ultrasound are usually negative during the early course of the disease. Bone scan is helpful for patients with suspected skeletal infection and poorly localising symptoms. MRI is the modality of choice for making the diagnosis.

REFERENCES

1. Kives SL, Lara-Torre E. Pyogenic sacroiliitis following an infected umbilical ring. *J Pediatr Adolesc Gynecol.* 2004;17:125-9.
2. Hodgson BF. Pyogenic sacroiliac joint infection. *Clin Orthop.* 1989;246:146-9.
3. Zimmermann B 3rd, Mikolich DJ, Lally EV. Septic sacroiliitis. *Semin Arthritis Rheumatol.* 1996;26:592-604.
4. Attarian DE. Septic sacroiliitis: the overlooked diagnosis. *J South Orthop Assoc.* 2001;10:57-60.
5. Osman AA, Govender S. Septic sacroiliitis. *Clin Orthop.* 1995;313:214-9.
6. Vyskocil JJ, McIlroy MA, Brennan TA, Wilson FM. Pyogenic infection of the sacroiliac joint. Case report and review of the literature. *Medicine (Baltimore).* 1991;70:188-97.
7. Ford LS, Ellis AM, Allen HW, Campbell DE. Osteomyelitis and pyogenic sacroiliitis: a difficult diagnosis. *J Paediatr Child*

- Health. 2004;40:317-9.
8. Doita M, Yoshiya S, Nabeshima Y, et al. Acute pyogenic sacroiliitis without predisposing conditions. *Spine*. 2003;28:E384-E389.
 9. Aprin H, Turen C. Pyogenic sacroiliitis in children. *Clin Orthop*. 1993;287:98-106.
 10. Cohen SM, Sochoetz DJ. Pyogenic sacroiliitis; another imitator of acute abdomen. *Surgery*. 1985;100:95-8.
 11. Bittini A, Dominquez PL, Martino-Pueoyo ML, López Longo FJ, Monteagudo I, Carreño L. Comparison of bone and gallium-67 scanning in heroin users' arthritis. *J Nucl Med*. 1985;26:1377-81.
 12. Klein MA, Winalski CS, Wax MR, Piwnica-Worms DR. MR imaging of septic sacroiliitis. *J Comput Assist Tomogr*. 1991;15:126-32.
 13. Murphey MD, Wetzel LH, Bramble JM, Levine E, Simpson KM, Lindsley HB. Sacroiliitis: MR imaging findings. *Radiology*. 1991;180:239-44.
 14. Sandrasegaran K, Saifuddin A, Coral A, Butt WP. Magnetic resonance imaging of septic sacroiliitis. *Skeletal Radiol*. 1994;23:289-92.
 15. Erdman WA, Tamburro F, Jayson HT, Weatherall PT, Ferry KB, Peshock RM. Osteomyelitis: characteristics and pitfalls of diagnosis with MR imaging. *Radiology*. 1991;18:533-9.
 16. Mormino MA, Esposito PW, Raynor SC. Peripelvic abscesses: a diagnostic dilemma. *J Pediatr Orthop*. 1999;19:161-3.