Pyogenic Sacroiliitis in a Pediatric Patient: A Rare Case of Infection by *Streptococcus intermedius*

**Abstract**

This is a case report of pyogenic sacroiliitis in a pediatric patient caused by *Streptococcus intermedius*. The patient is a 16-year-old boy who presented to an emergency department with sudden onset of back pain radiating to the left lower extremity. The diagnosis was confounded by the presence of isthmic spondylolisthesis. Plain radiography demonstrated mild isthmic spondylolisthesis but no radiographic signs of tumor, trauma, infection, arthritis, or other developmental problems. The C-reactive protein level was 23 mg/L. Over the next 24 hours, the patient developed fever, and the C-reactive protein level increased to 233 mg/L. Sacroiliitis and an iliopsoas abscess were identified on MRI. Blood cultures grew *S. intermedius*. The patient responded to antibiotic treatment and needle aspiration under CT guidance. Sacroiliitis is an uncommon condition and, to our knowledge, there is only one other case report of its being caused by *S. intermedius*. The previous report was in an adult.

Pyogenic sacroiliitis (PS) is a rare condition, representing 1% to 2% of all cases of septic arthritis. It occurs most frequently in children and young adults, with <200 cases of PS reported in the literature.1

Nonspecific physical examination findings, low suspicion of the examining physician, and rare diagnostic findings on radiographs often make diagnosis a challenge and can delay appropriate treatment.2,3

Sacroiliac involvement is thought to result from hematogenous spread or less frequently by local extension. Predisposing factors include a history of intravenous drug abuse, pelvic inflammatory disease, pregnancy, trauma, and infection. However, in many cases, no predisposing factor can be identified.2,4,5

Most cases are caused by *Staphylococcus aureus* (80%) and beta-hemolytic *Streptococcus*. Less frequent agents are *Hemophilus influenzae*, *Escherichia coli*, *Kingella kingae* and *Salmonella*. *Mycobacterium tuberculosis* and *Brucella* can also be agents of PS, especially in endemic areas.6

This case report presents a 16-year-old patient with PS, without predisposing factors and with isthmic spondylolisthesis (IS) as a confounding factor.
Case Report

The 16-year-old patient, without significant medical history, was admitted to the emergency department with sudden onset of low back pain radiating to the left lower limb to the level of the knee. He denied sensory and motor changes, fever, or other associated alterations. He had no history of trauma, drug abuse, or recent infection.

On physical examination, he was found to have tenderness over the left gluteal region, painful left hip motion, antalgic flexion of the hip, and a temperature of 37.6°C (99.7°F).

Analyses revealed a white blood cell count of 11.1 \( \times \) 10^9/µL (normal range, 4 to 11 \( \times \) 10^9/L), neutrophils of 74.2%, and a C-reactive protein level of 23 mg/L (normal range, <3.0 mg/L), without other significant changes.

Radiographs of the pelvis were normal (Figure 1), and the lumbar-sacral spine study revealed a grade I IS at L5-S1 (Figure 2).

The CT study of the lumbar spine confirmed bilateral IS at L5-S1 (grade I), with signs of chronicity, reduction in the diameter of the foramina but without L5 root compression, and L5-S1 protrusion without S1 root compression (Figure 3). Pain was intense, with poor response to paracetamol, opioid analgesics, and nonsteroidal anti-inflammatory agents.

The hypothesis of spondylolisthetic crisis was determined, and the patient was admitted to the Paediatric Orthopaedic Service to pain control and additional study by MRI.

Twenty-four hours after admission, the patient developed pain aggravation that scored 10/10 in the Numeric Rating Scale, with high fever (maximum, 40°C [104°F]) that responded poorly to drugs. The C-reactive protein level demonstrated a crescent pattern (maximum, 233 mg/L). Clinical and analytic aggravation required extending the study, and intravenous empiric ceftriaxone was started. Blood cultures were requested. He underwent ultrasonography of the hip and abdominal region without abnormal findings.

The MRI study (Figure 4) of the lumbosacral and pelvic region revealed signs of sacroiliitis involving the left sacroiliac joint, with an iliopsoas abscess (IPA) of 4.1 \( \times \) 3.8 \( \times \) 3.1 cm.

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Figure 1

AP pelvic radiograph without abnormal changes.

Figure 2

Lumbar spine sagittal radiograph with grade I isthmic spondylolisthesis at L5-S1.

Figure 3

Sagittal (A) and axial (B) CT images confirm isthmic spondylolisthesis at L5-S1 without root compression.

Figure 4

Lumbar spine CT coronal images, axial (A) and sagittal (B) views confirm grade I spondylolisthesis of L5 on S1.
MRI findings supported the diagnosis of PS. *Streptococcus intermedius* was isolated from blood cultures. Antibiotic therapy was changed to intravenous flucloxacillin and clindamycin with excellent clinical and analytical response.

CT-guided percutaneous drainage of the abscess was performed on day 13 after admission (Figure 5).

The patient underwent 2 weeks of intravenous antibiotic therapy with excellent clinical and analytical response. He was then discharged, with 2 weeks of oral flucloxacillin and clindamycin. The infection resolved without recurrence at 1 year. The patient recovered his previous functional status without restrictions.

**Discussion**

*S. intermedius*, *S. constellatus*, and *S. anginosus* are members of the *S. anginosus* group. They are a unique subset of bacteria within the viridans streptococci.7

*S. intermedius* is part of the normal flora in the oral cavity, as well as the upper respiratory, female urogenital, and gastrointestinal tracts. Although this organism is a commensal organism, it is also an opportunistic pathogen.8 Infection by this pathogen is typically associated with purulent abscesses formation. It is usually found in the brain or liver, central nervous system infections, and infective endocarditis. It is a rare agent of septic arthritis and osteomyelitis.8

PS is a rare disease. To our knowledge, there is only one other case report of PS caused by *S. intermedius* in an adult reported in the literature.14 We report here the first case of PS caused by *S. intermedius* in a pediatric patient.
The lack of specificity of clinical findings makes PS a condition difficult to diagnose. Differential diagnosis should include low back pain, hip disease, lumbar disk rupture with sciatica, spondylodiscitis, intra- or extra pelvic abscess, IPA, abdominal infection, pyelonephritis, kidney stones, rheumatic arthritis, and tumors.

This case has the particularity of the atypical clinical presentation, initially without fever and with pain radiating to the left lower limb, and the incidental finding of IS at L5-S1 in the image studies. Our hypothesis was of a spondylolisthetic crisis because this condition can exhibit an acute onset with severe back pain, hamstring spasm, and a crouched gait. Neurologic deficit can occur associated with larger slips, with radiculopathy resulting from either the foraminal stenosis or a concomitant herniated disk. High degrees of spondylolisthesis may present with neurogenic claudication or cauda equina syndrome.

Fever onset and inflammatory parameters increase, guided clinical investigation to an infectious condition. MRI findings revealed signs of sacroiliitis complicated with IPA. Iliopsoas abscess can be classified as primary (30% of cases) or secondary. Primary IPA occurs because of the hematogenous or lymphatic spread of microorganisms from a distant site. Secondary IPA accounts for most cases seen in adults and most often arises from intra-abdominal inflammatory processes, particularly those of intestinal origin. Other causes include urinary tract infection, instrumentation of the upper renal tract, spondylodiscitis, and other rarer conditions, such as PS. Yacoub et al9 have suggested that targeted antibiotics may be sufficient to treat small abscesses (<60 mm), but traditionally, broad-spectrum antibiotics associated with percutaneous or surgical drainage are the treatment of choice. In some cases, open drainage will be preferable, as with an IPA secondary to intra-abdominal disease, which also requires open surgical intervention (eg, Crohn disease, diverticulitis).9

A high degree of clinical suspicion is essential for any child or young adult with fever, localized tenderness in the sacroiliac joint, and buttock, hip or back pain. The lumbar sacral trunk, superior gluteal nerve, and obturator nerve cross anteriorly to the sacroiliac joint. Irritation of these structures explains radiating pain to the lower limb. Irritation of iliopsoas muscle can cause hip pain and mimick hip infection.3

Radiographs and CT are generally nondiagnostic.6 MRI of the pelvis is the most sensitive and specific image study for PS.1,3,4,10–12 Many studies conclude that clinical and laboratory findings in association with changes seen on MRI are sufficient to establish the diagnosis of septic sacroiliitis without joint aspiration biopsy.2,6

Blood cultures can allow agent isolation. When blood cultures are negative, fine-needle aspiration biopsy of the sacroiliac joint or open biopsy of the sacroiliac joint may be needed to yield the causative organism.3

Intravenous antibiotic therapy combined with aspiration drainage is associated with better outcomes. Many patients respond to antibiotics alone. Empirical antibiotics for PS should cover S aureus and include extended-spectrum penicillins or first-generation cephalosporins, until specific organism and antimicrobial sensitivities have been identified. The standard treatment is antibiotics for 4 to 6 weeks.1,3 Intravenous antibiotic therapy can be followed by oral administration after clinical and analytical improvement.6 If there is abscess formation or clinical improvement does not occur, percutaneous drainage or open drainage should be done.3,13

PS outcome is usually favorable, but a delay in diagnosis can result in increased abscess size and dissemination of infection. Joint destruction and chronic debilitation are possible complications.

In conclusion, we report a case of a rare infection. To our knowledge, we present the first case of PS caused by S intermedius in a pediatric patient. This case demonstrated an atypical clinical presentation and the incidental finding of IS in image studies that made differential diagnosis challenging. PS should be included in the differential diagnosis of any patient with fever and low back/buttock pain. A high index of suspicion is required.

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