

CASE REPORT

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Sacral joint infection caused by *Salmonella*: a post-gastroenteritis complication—a case report

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Abstract

Background Septic arthritis of the sacroiliac joint is an uncommon condition, accounting for only 1–2% of all septic arthritis cases. Its rarity, coupled with a nonspecific clinical presentation, often leads to diagnostic delays. While *Staphylococcus aureus* is the most common pathogen, *Salmonella* species are rare etiological agents, typically associated with specific risk factors. This case highlights the novelty of a *Salmonella enteritidis*-induced septic sacroiliitis in a previously healthy adolescent of Ladino ethnicity, emphasizing the importance of considering atypical pathogens.

Case presentation A 17-year-old Ladino male presented with severe lower back and buttock pain radiating to the left leg, 1 week after recovering from a gastrointestinal illness. Laboratory findings revealed elevated inflammatory markers, and imaging showed significant inflammation of the left sacroiliac joint. Diagnosis was confirmed via joint fluid aspiration, which identified *S. enteritidis*. The patient was treated with intravenous ceftriaxone and amikacin, transitioning to oral antibiotics for 6 weeks. Symptoms resolved within 72 hours of treatment initiation, with full recovery of mobility and sustained symptom-free status at 1-year follow-up.

Conclusion This case underscores the importance of timely diagnosis and tailored treatment for septic sacroiliitis caused by atypical pathogens. It also highlights the need to consider *Salmonella* in patients presenting with sacroiliac joint pain and a recent history of gastrointestinal infection, even in the absence of traditional risk factors, ensuring optimal clinical outcomes.

Keywords *Salmonella*, Sacroiliac joint infection, Sacroiliitis, Infection

Introduction

Septic arthritis of the sacroiliac (SI) joint is an uncommon condition, accounting for approximately 1–2% of all septic arthritis cases [1]. Its rarity and nonspecific

clinical presentation often lead to diagnostic challenges and delays in treatment. While *Staphylococcus aureus* is the predominant causative pathogen in septic arthritis, *Salmonella* species have been identified as less common etiological agents, particularly in individuals with underlying conditions, such as sickle cell disease, immunosuppression, or recent gastrointestinal infections.

The pathogenesis of *Salmonella*-induced septic sacroiliitis typically involves hematogenous spread from a primary gastrointestinal source. The clinical presentation may include fever, lower back or buttock pain, and limited mobility, often mimicking other conditions such as sciatica or herniated disc, thereby complicating the diagnosis. Advanced imaging modalities, including magnetic

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resonance imaging (MRI), are instrumental in identifying sacroiliac joint inflammation and guiding diagnostic procedures. Definitive diagnosis is usually confirmed through positive cultures from blood or synovial fluid aspirates [2].

A comprehensive review of 23 cases of *Salmonella* sacroiliitis revealed a predominance in adolescents, with a consistent clinical presentation and favorable response to appropriate antimicrobial therapy [3]. Early recognition and prompt initiation of targeted antibiotic treatment are crucial to prevent potential complications, including abscess formation or chronic joint dysfunction [4].

This report discusses the case of a 17-year-old male who developed septic arthritis of the sacroiliac joint caused by *Salmonella* following a recent gastrointestinal illness. This case underscores the importance of considering atypical pathogens in patients presenting with sacroiliac joint pain, especially when accompanied by a history of gastrointestinal infection.

Case presentation

A 17-year-old male of Ladino ethnicity presented with severe lower back and buttock pain radiating to the left leg. Symptoms began 1 week after recovering from a gastrointestinal illness characterized by fever and diarrhea. In addition, 4 weeks earlier, the patient had been hospitalized for this illness but had no significant medical history or known immunosuppressive conditions.

The pain, initially dull, progressively worsened, resulting in significant mobility limitations. On examination, the patient demonstrated localized tenderness over the left sacroiliac joint and a restricted range of motion due to pain. The Lasègue test was positive.

Routine laboratory studies revealed:

- C-reactive protein (CRP): 27.7 mg/L (elevated)

- Erythrocyte sedimentation rate (ESR): 88 mm/hour (elevated)
- White blood cell count: mild leukocytosis with left shift

Blood cultures and stool samples were negative, ruling out ongoing systemic or intestinal infections.

Pelvic MRI showed: significant inflammation and edema of the left sacroiliac joint, hyperintensity on T2-weighted images, joint effusion and bone marrow edema involving adjacent iliac and sacral bones, and surrounding soft tissue swelling, suggesting an active infectious process extending beyond the joint. These findings confirmed suspicion of infectious sacroiliitis (Figs. 1, 2).

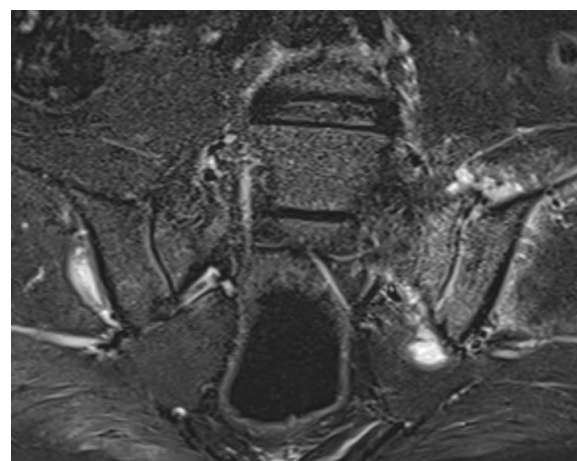


Fig. 2 Magnetic resonance imaging in the coronal plane shows inflammatory bone edema and bone erosions or partial bone destruction at the articular surfaces of the sacroiliac joints

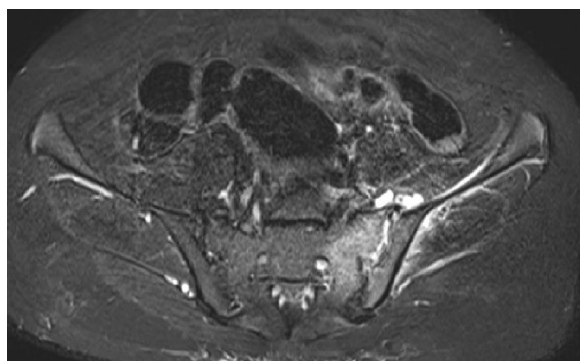


Fig. 1 Magnetic resonance imaging axial scan shows left-sided inflammation of the soft tissues around the sacroiliac joint and presence of fluid collections or abscesses around the joint

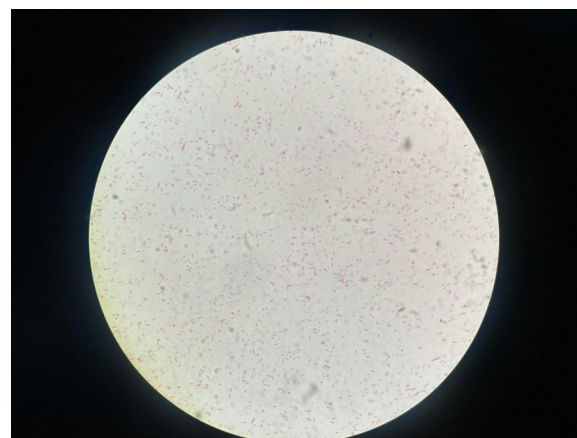


Fig. 3 Histopathological findings of *Salmonella* infection

The patient underwent a percutaneous biopsy of the left sacroiliac joint. Microbiological analysis of the joint fluid revealed *S. enteritidis* (Fig. 3).

Treatment plan and early follow-up

Initial treatment consisted of intravenous ceftriaxone and amikacin to cover potential resistant strains. After 10 days of intravenous therapy, the regimen transitioned to oral antibiotics tailored to *Salmonella*, with a planned 6-week duration.

Within 72 hours of initiating treatment, the patient experienced significant symptom relief, regaining mobility and reporting a marked reduction in pain.

Postoperative laboratory monitoring

- **At 2 weeks post surgery:** CRP decreased to 8 mg/L and ESR to 25 mm/hour. The patient reported no pain, and mobility was fully restored.
- **At 3 months post surgery:** a follow-up **computed tomography (CT) scan** was performed; no significant cartilage damage was identified, confirming joint preservation and healing.

Follow-up at 1 year

At 1 year, the patient remained asymptomatic with no recurrence of pain or limitations in mobility.

This case highlights the importance of timely diagnosis, appropriate surgical intervention, and tailored antibiotic therapy in infectious sacroiliitis, resulting in excellent clinical and functional outcomes.

Discussion

Septic arthritis of the sacroiliac (SI) joint caused by *Salmonella* is an exceedingly rare condition, typically associated with underlying risk factors such as recent gastrointestinal infections, immunosuppression, or hematologic disorders. However, its occurrence in otherwise healthy individuals without significant medical history, as in this case, underscores the diagnostic challenge it presents. Misdiagnosis or delayed diagnosis is common, given the overlap of symptoms with more prevalent conditions such as lumbar disc herniation, sciatica, or mechanical back pain, particularly in young and active patients [2, 4].

The pathogenesis is thought to involve hematogenous dissemination of *Salmonella* from the gastrointestinal tract to the SI joint, facilitated by transient or systemic bacteremia following recent gastrointestinal infection [4]. This mechanism highlights the need for a thorough clinical history, including recent infections or travel, which may provide critical diagnostic clues [5].

Current literature emphasizes the role of advanced imaging, particularly MRI, in the early detection of SI joint involvement. MRI provides superior soft tissue contrast and is invaluable in identifying early joint inflammation, abscess formation, or associated osteomyelitis [5]. However, imaging findings must be correlated with clinical presentation and microbiological studies to establish a definitive diagnosis. Aspiration or biopsy of the SI joint, guided by imaging, is the gold standard for isolating the causative organism and tailoring antimicrobial therapy [6, 7].

In managing septic arthritis of the SI joint, early and targeted antibiotic therapy is paramount to prevent irreversible joint damage and systemic complications. Recent reviews suggest a minimum of 4–6 weeks of antibiotics, with initial parenteral therapy followed by oral therapy once clinical improvement and microbiological clearance are achieved [7, 8]. When conservative management fails, or in cases with extensive joint destruction or abscess formation, surgical intervention may be necessary. One advanced surgical option is sacroiliac fusion, which aims to stabilize the joint and alleviate chronic pain caused by residual joint instability or deformity. Sacroiliac fusion, often performed using minimally invasive techniques, has shown promising outcomes in restoring functionality and improving the quality of life in patients with advanced joint damage secondary to infection. [9]

Conclusion

This case highlights the diagnostic and therapeutic challenges of *Salmonella*-induced SI joint septic arthritis, especially in patients without predisposing factors. It emphasizes the importance of maintaining a high index of suspicion for atypical pathogens in cases of septic arthritis presenting in unusual anatomical locations. Early recognition through advanced imaging, coupled with microbiological confirmation, remains the cornerstone of diagnosis. A prompt and targeted antibiotic regimen is critical to ensuring optimal recovery and minimizing complications. In select cases, sacroiliac fusion may be a viable option to address persistent joint damage and instability. Further studies and case reports are needed to enhance our understanding of this rare condition and refine its management strategies.

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Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

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Competing interests

The authors declare that they have no competing interests.

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