Sacroiliitis due to *Salmonella* Typhi: A case report

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**Abstract**

**Context:** Pyogenic infections of the sacroiliac joint are observed quite rarely. The most frequent causative microorganisms are *Staphylococcus aureus*, *Streptococcus* species, and *Pseudomonas aeruginosa* that are commonly found in patients under intravenous medication. In this paper, a rare sacroiliitis case that developed due to *Salmonella* Typhi is discussed.

**Case Report:** A woman at the age of twenty applied to our clinic with complaints of fever, headache and diarrhea with which she had been suffering for five days. On physical examination, she had a slight fever, with a body temperature of 38.6°C. She was hospitalized, and *Salmonella* Typhi was isolated from her blood culture. Later on, the patient described pain during left hip movement. Diffusion-weighted magnetic resonance imaging and scintigraphic examinations revealed left sacroiliitis.

**Conclusion:** Although sacroiliitis arising from *Salmonella* Typhi infection is a rare entity, it should not be ignored in patients who have a clinical history for sacroiliitis.

**Keywords:** Salmonella Typhi, sacroiliitis, septic arthritis

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**Introduction**

Septic arthritis is an inflammatory disease of the joints that develops after infection with various microorganisms. The most frequent microorganisms causing pyogenic infections in the sacroiliac joint are *Staphylococcus aureus*, *Streptococcus* species and *Pseudomonas aeruginosa*, the latter being more frequent in patients under intravenous medication [1]. *Salmonella* Typhi sacroiliitis is observed quite rarely and only a few cases have been reported in the clinical literature up to now [2-6]. To our knowledge, this case report is the second experience of *Salmonella* Typhi sacroiliitis in Turkey, and the seventh reported in the clinical literature.

**Case Report**

This case comes from the Erçek town of the province of the Van in the Republic of Turkey where a small-scale salmonellosis epidemic is seen. A woman at the age of twenty applied to our clinic with complaints of fever, headache and diarrhea with which she had been suffering for five days. On physical examination, she had a slight fever, with a body temperature of 38.6°C. Her arterial blood pressure was 110/70 mm Hg and her heart rate was 76 beats/minute. No other pathology was found apart from a slightly pale skin and relative bradycardia.

Laboratory analyses of the patient’s blood revealed a white blood cell (WBC) count of 6200/mm³ [70% polymorphonuclear leukocytes (PMNL), 30% mononuclear leukocytes (MNL)], hemoglobin 13g/dL, hematocrit 38%, platelet count 103,000/mm³, erythrocyte sedimentation rate (ESR) 34 mm/hour, C-reactive protein (CRP) 44.6 mg/L, aspartate aminotransferase (AST) 35 U/L, alanine aminotransferase (ALT) 21 U/L, alkaline phosphatase (ALP) 148 U/L, and direct/indirect bilirubin 1.6/0.2 mg/dL. Copious amounts of leucocytes were observed in feces by microscopy. A fever-heart rate discordance was observed. The woman was hospitalized in the Department of Infectious Diseases and Clinical Microbiology with a presumptive diagnosis of salmonellosis.

After the culture of a blood sample was initiated, treatment with oral ciprofloxacin at 500 mg, 1 tablet twice daily, was started. In the third day of her hospitalization, the patient’s...
fever reduced. From her blood culture, *Salmonella* Typhi was isolated with sensitivity to ciprofloxacin. On abdominal sonography, hepatomegaly (mid-clavicular and in caudocranial 175 mm) was found. A locomotor system examination revealed no pathology. The patient was discharged in the seventh day of her hospitalization to complement her therapy to 14 days.

Five days later, she returned with complaints of fever, asthenia, abasia and pain on the left hip. Physical examination revealed fever which was measured as a body temperature of 39.1°C. Her blood pressure was 120/80 mm Hg and heart rate was 82 beats/minute. A locomotor system examination of the patient revealed pain during left hip movement, lack of motor power, left sacroiliac compression and distraction, and positive results in the Faber tests. Laboratory analyses of the patient revealed: WBC 9400/mm³ (76% PMNL, 24% MNL), hemoglobin 13g/dL, hematocrit 38%, platelet count 206,000/mm³, ESR 60 mm/hour, CRP 79 mg/L, AST 27 U/L, ALT 23U/L, ALP 192 U/L, and direct/indirect bilirubin 1.4/0.4 mg/dL. Tests for hepatitis B (HBsAg), hepatitis C (anti-HCV), and human immunodeficiency virus (anti-HIV) were negative, as was the test for brucellosis by the Brucella tube agglutination.

The woman was re-hospitalized with a presumptive diagnosis of sacroiliitis due to *Salmonella* Typhi. No bacterial reproduction was observed in the hemoculture and bone marrow aspiration cultures of the patient. Tests for HLA-B27 antigen, antinuclear antibody (ANA) and anti-dsDNA antibodies were negative. No positive finding for ankylosing spondylitis was found. While no pathology was found in the direct sacroiliac radiography of the patient, her sacroiliac diffusion-weighted magnetic resonance imaging (MRI) examination revealed signal changes consistent with edema in the bones adjacent to the left sacroiliac joint and inflammation in the adjacent paraspinal muscles, corresponding to left sacroiliitis (Fig. 1). On the three-phased and whole body bone scintigraphy, on the late static images, activity retention which increased in focal terms in the left sacroiliac joint region, consistent with sacroiliitis, was reported (Fig. 2).

With these symptoms and findings, the patient had a diagnosis of *Salmonella* Typhi sacroiliitis, and intravenous ceftriaxone, 1g twice daily medication was started. A significant reduction in the fever of the patient was observed within three days of treatment with antibiotics. The patient’s pain was reduced, she became better in clinical terms, and started to walk after a week. In the 21st day of the therapy, it was observed that her body temperature was in normal range, her complaints were reduced, and she was discharged with recovery. A control diffusion-weighted MRI examination 10 weeks later found no pathology except minimal edema.

**Discussion**

*Salmonella* infections cause acute gastroenteritis, bacteremia, enteric fever, and *salmonella*-bearing and localized infections. Localized bone and joint infections are seen in less than 1% of all *Salmonella* infections, and such localized infections are generally observed with HIV infection, systemic lupus erythematosus, sickle cell anemia, and immunosuppressive therapy fields [7]. Only a few sacroiliitis cases due to *Salmonella* Typhi infection have been reported in clinical literature.

In the cases of *Salmonella* Typhi sacroiliitis, the reported clinical findings were high fever, fever-heart rate discordance, waist and hip pain, pain attacking the femur, and difficulty in walking [2-6]. In the case reported here, the patient applied to our hospital with complaints of fever, asthenia, abasia and left hip pain. There was no history of trauma, but there was fever-heart rate discordance, like the other cases reported in the literature.

When direct radiography reveals no specific pathology, scintigraphy is a method which is preferred in the early diagnosis of pyogenic sacroiliitis, and computed tomography (CT) and magnetic resonance imaging (MRI) analyses are auxiliary to the early diagnosis [1, 4]. Consistent with the clinical literature reports, no pathology was found on direct sacroiliac joint radiography in this case, but findings consistent with left sacroiliitis facilitating the diagnosis were observed on bone scintigraphy and sacroiliac diffusion-weighted MRI.
It has been reported that compared with other *Salmonella* infections, *Salmonella Typhimurium* more frequently causes reactive arthritis [8]. In this case, in the blood culture which was taken for the first diagnosis, *Salmonella Typhi* multiplied. In the second blood and bone marrow samples, no bacterial reproduction was observed, which was thought to be due to the intake of ciprofloxacin and ceftriaxone which were initiated before the second samples were taken.

Reactive arthritis is an acute, sterile joint inflammation which usually appears in 1 to 4 weeks following an infection. Tests for HLA B27 antigen are generally positive in 60% to 90% of the post-enteric reactive arthritis cases. Extraarticular findings (mucocutaneous symptoms, ocular inflammation, cardiac retention, renal retention, cervicitis, and urethritis) can be observed in cases with reactive arthritis [9-12]. Acute asymmetric inflammatory oligo-arthritis (on average three joint retentions) is generally observed in reactive arthritis. In the early stages, lower extremity joints such as knee and ankle are involved, and upper extremity and spine (back bone) joints are involved later. In our case, monoarticular (left sacroiliac joint) retention was existent, no extraarticular findings were observed, and HLA B27 antigen was negative. Due to the high fever, abasia, observance of the complaints of the pain attacking the waist and the femur, and pathological findings in radiology and scintigraphy, we think that this case was not a reactive arthritis but a sacroiliitis complication which developed in connection with inadequate therapy or relapse.

In the clinical literature of cases with *Salmonella Typhi* sacroiliitis, the etiologic microorganism grew in blood culture, and all of the cases responded to antibiotic therapy. In recent years, due to antibiotic resistance in *Salmonella* infections, quinolones came to be the most recommended antibiotics instead of the classic medications: ciprofloxacin and ofloxacin for adults, and cephalosporin for children and pregnant women, used for 14 days. For complicated cases such as the development of septic arthritis, therapy duration is 2 to 4 weeks. Intravenous treatment is started for 5-7 days, and if treatment response is positive, oral therapy can be initiated [13-15].

Although antibiotic use for reactive arthritis is still not justified, use of long-term combinations of rifampicin and doxycycline may be beneficial [16]. The use of anti-inflammatory agents and steroid or immunosuppressive therapies are recommended [8, 9]. For the patient in this case, third-generation cephalosporin treatment for three weeks was enough for recovery without anti-inflammatory agents.

In conclusion, although *Salmonella Typhi* sacroiliitis is a rare entity, it should not be ignored in patients who have a clinical history for sacroiliitis. Though no pathology was found in the direct radiography of the sacroiliac joint, bone scintigraphy (Te99m MDP) and diffusion-weighted MRI look like beneficial methods for the early diagnosis of this type of sacroiliitis.

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