

# Magnetic Resonance Imaging Findings of Bilateral Asymmetrical Involvement of Brucella Sacroiliitis

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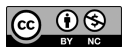
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## Abstract

Brucellosis is a zoonosis that may affect various organs or systems. The musculoskeletal system is the most commonly affected site in human brucellosis. Brucellosis usually presents with unilateral involvement in sacroiliac joints. Herein, a case of bilateral asymmetric involvement of brucellosis in both sacroiliac joints is presented with magnetic resonance imaging findings.

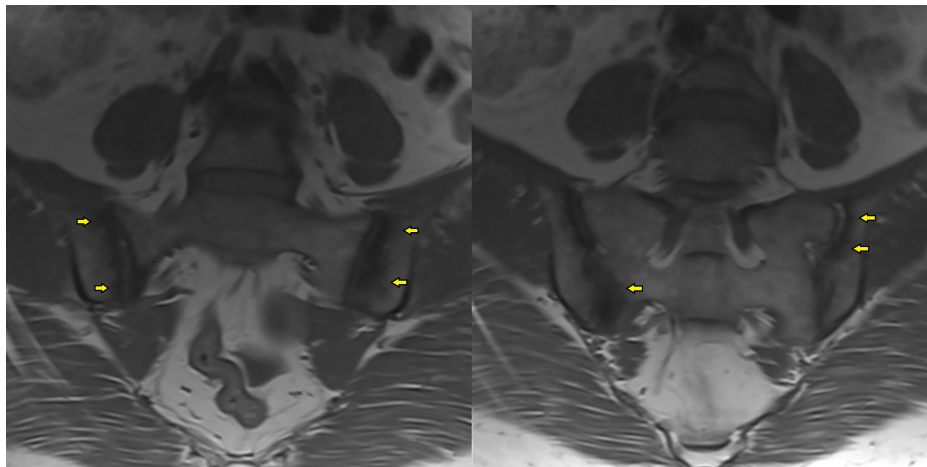
**Keywords:** Brucellosis, magnetic resonance imaging, sacroiliitis, sacroiliac joint

## INTRODUCTION

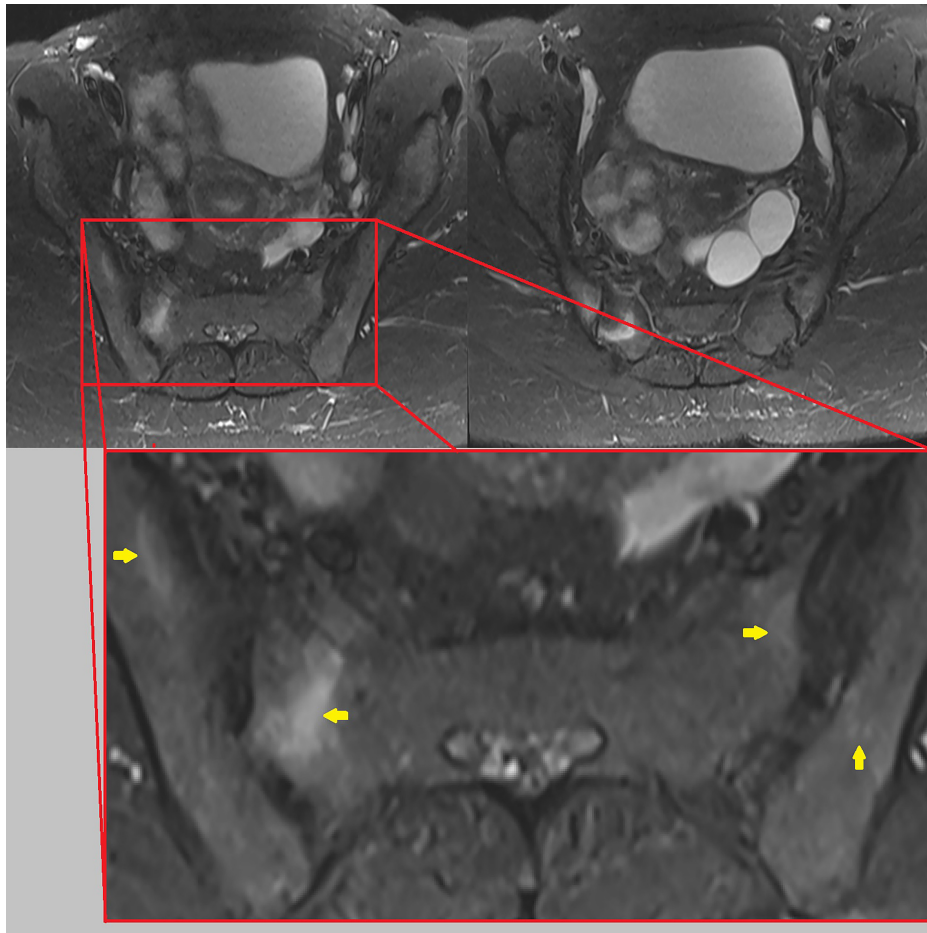
Human brucellosis remains a significant public health problem in most developing countries. The musculoskeletal system is one of the most common sites affected by this zoonosis and affects 20%-40% of the patients with brucellosis.<sup>1</sup> Vertebral osteomyelitis related to brucellosis is commonly encountered in Mediterranean countries.<sup>2</sup> Moreover, the sacroiliac joint is the most commonly reported osteoarticular space in the literature for this disease.<sup>3</sup> Sacroiliitis is defined as the inflammation of the sacroiliac joint or both sacroiliac joints, and this entity may have an acute or chronic presentation. The chronic presentation can usually be underlain by rheumatic inflammatory and non-inflammatory diseases. Acute sacroiliitis is rare and is more likely caused by infectious or neoplastic processes.<sup>4,5</sup> Patients may present with severe pain because of nerve irritations, due to the adjacent lumbosacral plexus, mainly due to the involvement of L4-L5 nerves.<sup>6</sup> Magnetic resonance imaging (MRI) is a very useful imaging technique to detect the involvement of brucellosis in sacroiliac joints. The typical involvement pattern of brucella sacroiliitis is unilateral, and the aim of this article is to present the bilateral asymmetric involvement of brucellosis in sacroiliac joints.

## CASE REPORT

After obtaining the consent form from the patient, the history and laboratory results were noted, and MR images were obtained using the picture archiving and communication system to prepare this article.



**Figure 1.** T1-weighted coronal plane images indicate bilateral subchondral sclerosis with hypointense signal in both sacroiliac joints (yellow arrows show the hypointensity representing subchondral sclerosis).



**Figure 2.** T2-weighted axial plane short tau inversion recovery (STIR) images reveal the subchondral and medullary edema in both sacroiliac joints with right-sided dominance, and the yellow arrows point to areas of bone marrow edema in the magnified image.

A 46-year-old female patient was admitted to the physical therapy and rehabilitation department complaining of lower back and right flank pain. The patient was living in a rural area, and she was a farmer. She did not have any history of psoriasis, urethritis, diarrhea, trauma, or familial inflammatory arthropathy. Her temperature, blood pressure, and heart rate were normal. Her leukocyte count was 6900/ $\mu$ L, sedimentation rate was 46 mm/h, and C-reactive protein level was 94.8 mg/dL. Alanine transaminase, aspartate transaminase values, serum calcium, uric acid results, and urine test results were within normal limits. There was no positive result for a purified protein derivative (PPD) test for tuberculosis and the results of the other rheumatological laboratory tests were negative. Brucella Rose Bengal test was positive, and the Brucella immunocapture test was positive for 1/320 titer. She was then consulted with the infectious diseases department, and the clinicians requested a sacroiliac MRI.

### MAIN POINTS

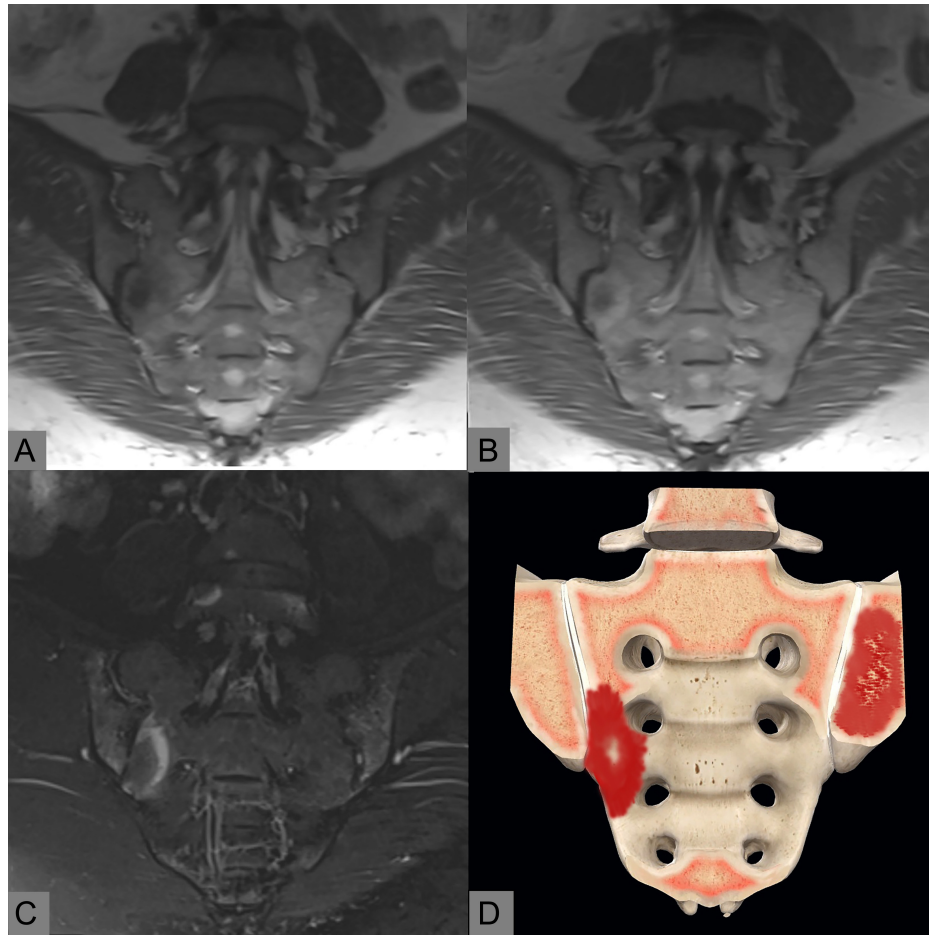
- Psoriatic arthritis, gout, or reactive arthritis are usually encountered with bilateral asymmetrical involvement.
- Enteropathic arthritis, ankylosing spondylitis, and rheumatoid arthritis tend to present with bilateral and symmetric sacroiliitis.
- Pyogenic septic arthritis, tuberculous sacroiliitis, and brucella sacroiliitis are usually observed with unilateral involvement.

Sacroiliac MR images revealed bilateral subchondral sclerosis (low signal on T1W and T2W images) (Figure 1) and bone marrow edema (low signal on T1W images and high signal on T2W images, especially on T2W short tau inversion recovery (STIR) images) in ilium and sacrum (Figure 2). There were patchy contrast-enhanced areas in the joints' iliac and sacral sides. The distribution of MRI findings showed right-sided and sacral dominance (Figure 3). An obvious periarticular involvement had not been indicated; however, MRI revealed high signals in the superior intraarticular space of the right sacroiliac joint on the T2-weighted fat-saturated coronal plane which might represent a small amount of intraarticular fluid accumulation with chondral edema (Figure 3C).

### DISCUSSION

Brucellosis is a well-known zoonosis caused mainly by animal contact or consumption of unpasteurized milk. Patients generally present with undulating fever. Myalgia, arthralgia, and back pain are other common complaints and symptoms of this disease. Blood tests should be done to confirm the diagnosis. Brucellosis may present with hepatomegaly, splenomegaly, or lymphadenopathy, but none of them are characteristic of this disease that affects various organs and tissues.

Brucella spondylodiscitis constitutes 6%-58% of all brucellosis osteoarticular involvements. The most affected areas in the spinal system are as follows: the lumbar area (60%), thoracic area (19%), and cervical



**Figure 3.** T1-weighted (A), contrast-enhanced T1-weighted (B), and T2-weighted fat-saturated (C) coronal plane images indicate the asymmetric bilateral sacroiliac involvement of the disease. Three-dimensional schematic image depicts the subchondral and medullar edema of the sacroiliitis (D).

area (12%).<sup>7</sup> Unilateral sacroiliitis is the most common form of sacroiliitis in brucellosis. However, asymmetric bilateral involvement may also be encountered.<sup>8</sup>

Especially in the early stages, plain radiography has a limited role in diagnosing sacroiliitis due to the poor sensitivity of this imaging technique. However, conventional x-rays are still used as the initial imaging method. Computed tomography has higher sensitivity than radiography for detecting joint space narrowing and millimetric bony erosions.<sup>9</sup>

Magnetic resonance imaging, with the absence of ionizing radiation, has the advantage to reveal the early involvement and is still the imaging method of choice for sacroiliitis. Bone marrow edema in subchondral areas is characterized by low T1 and high T2 signals. As a very sensitive MRI sequence for bone marrow edema, the STIR sequence is also helpful in determining edema in the early stages of the disease. Contrast-enhanced T1-weighted fat-saturated images are also valuable for detecting active disease in sacroiliitis. T2-weighted imaging and STIR sequences are very helpful to show intraarticular fluid collection; moreover, bony erosions can also be depicted using MRI. Imaging periarticular soft tissue involvement is another advantage of MRI as this technique has the superiority to revealing the extent of sacroiliitis to muscle and other periarticular soft tissues. This modality will

also reveal subchondral sclerosis, bony erosions, and ankylosis in the chronic phase of the infection.<sup>10</sup>

Involvement of sacroiliitis by various diseases can be classified concerning bilateral–unilateral or symmetrical–asymmetrical involvement of the disease. Psoriatic arthritis, gout, or reactive arthritis are usually encountered with bilateral asymmetrical involvement. Enteropathic arthritis, ankylosing spondylitis, and rheumatoid arthritis tend to present with bilateral and symmetric sacroiliitis. Pyogenic septic arthritis, tuberculous sacroiliitis, and brucella sacroiliitis are usually observed with unilateral involvement. In this current case report, we presented a case of brucellosis with bilateral asymmetrical involvement of sacroiliac joints.

Besides various infectious and rheumatological diseases, which may involve the sacroiliac joints, metastatic lesions, destructive neoplastic processes, hyperparathyroidism, and osteitis condensans ilii may also mimic sacroiliitis and should be kept in mind for the differential diagnosis of sacroiliitis.<sup>11</sup>

**Informed Consent:** Written informed consent was obtained from the patient who participated in this case report.

**Peer-review:** Externally peer-reviewed.

**Declaration of Interests:** The authors declare that they have no competing interest.

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# REFERENCES

1. Mehanic S, Baljic R, Mulabdic V, et al. Osteoarticular manifestations of brucellosis. *Med Arch*. 2012;66(3):24-26. [\[CrossRef\]](#)
2. Rubach MP, Halliday JE, Cleaveland S, Crump JA. Brucellosis in low-income and middle-income countries. *Curr Opin Infect Dis*. 2013;26(5):404-412. [\[CrossRef\]](#)
3. Antonelli MJ, Magrey M. Sacroiliitis mimics: a case report and review of the literature. *BMC Musculoskelet Disord*. 2017;18(1):170. [\[CrossRef\]](#)
4. Slobodin G, Hussein H, Rosner I, Eshed I. Sacroiliitis – early diagnosis is key. *J Inflamm Res*. 2018;11:339-344. [\[CrossRef\]](#)
5. Navallas M, Ares J, Beltrán B, Lisbona MP, Maymó J, Solano A. Sacroiliitis associated with axial spondyloarthritis: new concepts and latest trends. *RadioGraphics*. 2013;33(4):933-956. [\[CrossRef\]](#)
6. Karami MM, Al-Mufarrh DS. Acute Pyogenic Sacroiliitis: Brucellosis and early diagnosis. *Egypt J Hosp Med*. 2021;85(1):2785-2787. [\[CrossRef\]](#)
7. Korkmaz P, Ataizi ZS, Çevik FG, et al. Brucella spondylodiscitis: Multifocal involvement in thoracic and lumbar areas; a rare case. *J Microbiol Infect Dis*. 2015;5(3):129-132. [\[CrossRef\]](#)
8. Özeri Z, Nacı B, Çakıt BD, Saraçoğlu M, Erdem HR. Fırat tıp. *Dergisi*. 2010;15(1):44-47.
9. Arkun R, Mete BD. Musculoskeletal brucellosis. *Semin Musculoskelet Radiol*. 2011;15(5):470-479. [\[CrossRef\]](#)
10. Bozgeyik Z, Aglamis S, Bozdog PG, Denk A. Magnetic resonance imaging findings of musculoskeletal brucellosis. *Clin Imaging*. 2014;38(5):719-723. [\[CrossRef\]](#)
11. Alp E, Doganay M. Current therapeutic strategy in spinal brucellosis. *Int J Infect Dis*. 2008;12(6):573-577. [\[CrossRef\]](#)