Journal of
Babol University of Medical Sciences
JBUMS
e-ISSN: 2251-7170 p-ISSN: 1561-4107

A Rare Case of Focal Brucellosis with Multiple Complications: A Case Report

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Article Type

Case Report

Received:
Jul 6th 2024
Revised:
Aug 24th 2024
Accepted:
Dec 26th 2024

ABSTRACT

Background and Objective: Brucellosis is a worldwide zoonotic infection, well recognized for its diversity of manifestations. This case report highlights a rare presentation of brucellosis with acetabulofemoral monoarthritis, iliopsoas pyomyositis, and abscess, emphasizing the importance of early diagnosis, appropriate treatment, and follow-up.

Case Report: A 35-year-old male rancher with a history of zoonotic exposure presented with a 45-day history of left inguinal pain radiating to the lumbar region, fever, and restricted movement in the left hip. His symptoms had progressively worsened despite initial treatment with antibiotics. He had a prior episode of brucellosis 18 months earlier, but prematurely discontinued treatment after partial improvement. Physical examination revealed tenderness, swelling, and movement limitation in the left hip. Laboratory tests indicated elevated inflammatory markers, and imaging studies suggested focal brucellosis with chronic monoarthritis and pyomyositis. Synovial fluid analysis confirmed Brucella melitensis via polymerase chain reaction (PCR), and the patient was diagnosed with brucellosis complicated by acetabulofemoral monoarthritis and iliopsoas abscess. Surgical drainage was performed, and the patient was started on a combination of doxycycline and rifampin. He showed significant improvement, with full resolution of symptoms after a 12-week antibiotic regimen.

Conclusion: The results of the present study demonstrated that focal brucellosis, though rare, can lead to significant morbidity if not promptly diagnosed and treated. This case demonstrates the necessity of early intervention and prolonged treatment in preventing chronic and relapsing disease. Clinicians should remain vigilant for atypical presentations, especially in patients with occupational exposure and previous episodes of brucellosis.

Keywords: *Brucellosis, Hip, Arthritis, Pyomyositis, Iliopsoas Abscess.*

Cite this article: Salami Khaneshan A, Jafari S, Sohrabi M, Masoumzadeh N. A Rare Case of Focal Brucellosis with Multiple Complications: A Case Report. *Journal of Babol University of Medical Sciences*. 2025; 27: e53.

[DOI: 10.22088/jbums.27.1.53]

Introduction

Brucellosis is a widespread zoonotic infection caused by bacteria of the Brucella genus, affecting both humans and animals. The disease poses a significant public health concern, particularly in developing regions, due to its economic impact on livestock production. Its global distribution is closely linked to agricultural practices and the uneven availability of veterinary and public health resources. Brucellosis remains endemic in parts of Asia, Africa, the Middle East, and Latin America, with countries like Syria, Iran, Kenya, and Mongolia reporting high incidences. Recently, re-emerging cases have been observed in regions such as Bosnia, the USA, and parts of Europe, largely attributed to the increased movement of people and food products across borders (1-3).

Iran is among the countries with a high incidence of brucellosis, especially in rural areas where contact with livestock is frequent. The disease is endemic in the western provinces, with regions such as Kermanshah, Kurdistan, and Lorestan reporting the highest rates (4). Central provinces like Isfahan have shown fluctuating incidence trends over the past decade, reflecting ongoing challenges in disease control (5). Human brucellosis is primarily transmitted zoonotically, through direct contact with infected animals, especially sheep, goats, and cattle, making individuals in agriculture and animal husbandry particularly vulnerable. The consumption of unpasteurized dairy products, another major transmission route, has led to numerous outbreaks in areas where pasteurization is uncommon (6, 7). Despite livestock vaccination efforts, the disease remains endemic in Iran due to challenges in diagnosis, delayed treatment, and occupational exposures (8).

Brucellosis is a zoonotic infection characterized by a broad spectrum of nonspecific symptoms, often complicating early diagnosis. Common symptoms include fever, fatigue, sweating, joint pain, and muscle aches, frequently leading to confusion with other febrile conditions such as influenza or tuberculosis. Some cases are presented acutely with severe manifestations, while others progress slowly with chronic fatigue, weight loss, and recurrent fever, contributing to diagnostic delays (9, 10). Splenomegaly and liver enlargement may occasionally occur during the acute phase; however, joint and bone pain are among the most common presenting symptoms (11).

Focal brucellosis occurs when the infection localizes to specific organs, most frequently affecting the osteoarticular system, with complications such as spondylitis, sacroiliac arthritis, and peripheral arthritis, reported in 10% to 85% of cases. Other common sites include the genitourinary system, where epididymo-orchitis occurs in up to 20% of male patients (9, 12). Rare but severe complications like endocarditis, responsible for most brucellosis-related deaths despite affecting fewer than 2% of cases, and neurobrucellosis, which manifests as meningitis or encephalitis, further challenge clinicians due to their infrequency and potential for misdiagnosis (13-15).

This case report highlights the importance of recognizing rare complications of focal brucellosis, which are often underreported and misdiagnosed due to their atypical presentations. Documenting such cases is crucial for improving clinical awareness and guiding more accurate diagnosis and management in similar future cases.

[DOI: 10.22088/jbums.27.1.53]

Case Report

This study was approved by the Ethics Committee of Tehran University of Medical Sciences with the code IR.TUMS.IKHC.REC.1403.410. A 35-year-old male rancher was referred to Imam Khomeini Hospital in Tehran on May 12, 2023, with a 45-day history of left inguinal pain radiating to the lumbar region. The pain was preceded by a blunt trauma to the left hip, followed by local swelling. Two days after the onset of pain, the patient experienced fever, chills, diaphoresis, and increased limitation of active movement in the left hip. These symptoms were progressively worsening at the time of referral. The patient had a history of brucellosis 18 months ago, initially presenting with bilateral inguinal pain. He was treated with intravenous (IV) antibiotics, including a two-week course of gentamicin and doxycycline, which led to clinical improvement. However, he prematurely discontinued his treatment plan after symptom resolution. Notably, he had recently been involved in the calving of multiple diseased cattle, several of which experienced abortions and subsequently died. This zoonotic exposure is presumed to have contributed to his current condition. The patient is a current cigarette smoker (10 pack years) but denied illicit drug use or alcohol consumption. His medical history was otherwise unremarkable. He did not report any recent travel or consumption of unpasteurized dairy products. The patient consented to the collection and publication of his medical data for academic purposes.

Prior to his referral, the patient had been treated at a local medical center with gentamicin (240 mg daily, IV), rifampin (300 mg twice daily, oral), and ciprofloxacin (500 mg twice daily, oral) for one month without improvement. A pelvic ultrasound was performed, but due to lack of response, he was referred to this hospital for further examinations. Upon admission to the hospital, the patient was afebrile with the following vital signs: pulse rate of 75 beats per minute, blood pressure of 104/59 mmHg, respiratory rate of 18 breaths per minute, and body temperature of 37.2°C, with a peripheral capillary oxygen saturation of 96%. Physical examination revealed tenderness, swelling, and limited active and passive movement of the left hip joint. There was no erythema or warmth upon palpation, but the patient was unable to bear weight on the left leg. Other aspects of the physical examination were unremarkable. Initial laboratory findings showed elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), liver transaminases, and alkaline phosphatase. A second pelvic ultrasound was conducted, followed by a computed tomography (CT) scan with contrast and magnetic resonance imaging (MRI) without contrast (Figure 1, Table 1).

Figure 1. CT scan findings

[DOI: 10.22088/jbums.27.1.53]

Table 1. Imaging studies

Imaging modality	Findings
First pelvic ultrasound	Cystic mass of 22×33×68mm dimensions and approximate volume of 26mL with internal reticulation at the insertion of the left iliopsoas muscle suggestive of iliopsoas muscle.
Second pelvic ultrasound	Left inguinal hypoheteroechoic mass of 27×19×24mm dimensions and approximate volume of 7mL with internal lace-like echoes suggestive of hematoma.
CT with contrast	Erosion in acetabulum cortex and femoral head Bone density changes in acetabulum and femur Acetabulofemoral joint synovial thickening with loculated synovial fluid accumulation anteriorly at the medial border of iliopsoas insertion Multiple reactive lymph nodes up to 21×12mm in the left external iliac and para-aortic chain
MRI without contrast	Left acetabulofemoral joint synovial thickening, with joint effusion suggestive of chronic septic arthritis Left iliopsoas bursal effusion and thickening suggestive of chronic bursitis Edema and sprain of the left iliopsoas muscle suggestive of myositis Foci of abnormal bone marrow signal in the anterior aspect of acetabulum and femoral neck suggestive of early osteomyelitis

These imaging studies raised suspicion of focal brucellosis with complications such as chronic monoarthritis, chronic bursitis, iliopsoas abscess, myositis, and osteomyelitis. Differential diagnoses included chronic septic arthritis due to tuberculosis or other pyogenic bacteria. Periarticular collections were surgically drained, and the patient was empirically started on a regimen of doxycycline (100 mg twice daily, oral), rifampin (900 mg daily, oral), ceftriaxone (1 g twice daily, IV), and vancomycin (1 g twice daily, IV). Synovial fluid analysis revealed 60 white blood cells/mm³ with 90% polymorphonuclear cells. Although synovial fluid cultures showed no bacterial growth after 72 hours, polymerase chain reaction (PCR) testing identified Brucella melitensis. The PCR was negative for Mycobacterium tuberculosis, Neisseria meningitidis, Staphylococcus aureus, and Haemophilus influenzae. Brucella-specific serological tests were positive, with a standard tube agglutination titer of 1:620 and a Coombs Wright titer of 1:1280.

The final diagnosis was complicated brucellosis with acetabular femoral monoarthritis, iliopsoas pyomyositis, and abscess. After confirming the diagnosis, surgical drainage of the abscess was performed. The patient remained hospitalized for 12 days. Two days after surgery, he experienced significant relief from his hip pain and was able to bear weight on his left leg. The patient was discharged with a revised antibiotic regimen consisting of doxycycline (100 mg twice daily, oral) and rifampin (900 mg daily, oral) for a total treatment course of 12 weeks. Follow-up at 6 weeks revealed complete resolution of the patient's symptoms with no recurrence of pain or functional limitation. At the 12-week follow-up, repeat imaging (MRI) and laboratory tests confirmed the absence of active infection (Table 2), with normalized inflammatory markers (Figure 2). The patient reported full recovery, including the ability to resume his occupational duties without limitations.

[DOI: 10.22088/jbums.27.1.53]

Table 2. Laboratory data

Initial laboratory analysis		Synovial fluid analysis	
WBC (per mcL)	7400	RBC (per mcL)	138000
Hb (g/dL)	13.0	WBC (per mcL)	60
PLT (per mcL)	251000	PMN (%)	90
ESR (mm/h)	50	Glucose (mg/dL)	23
CRP (mg/L)	38	Protein (g/dL)	300
AST (IU/L)	32	Albumin (g/dL)	100
ALT (IU/L)	40	LDH (IU/L)	538
ALP (IU/L)	213		
PT (s)	13.9		
PTT (s)	31.0		
INR	1.15		
Urea (mg/dL)	26		
Cr (mg/dL)	1.1		
Na (mEq/L)	140		
K (mEq/L)	4		
BS (mg/dL)	101		

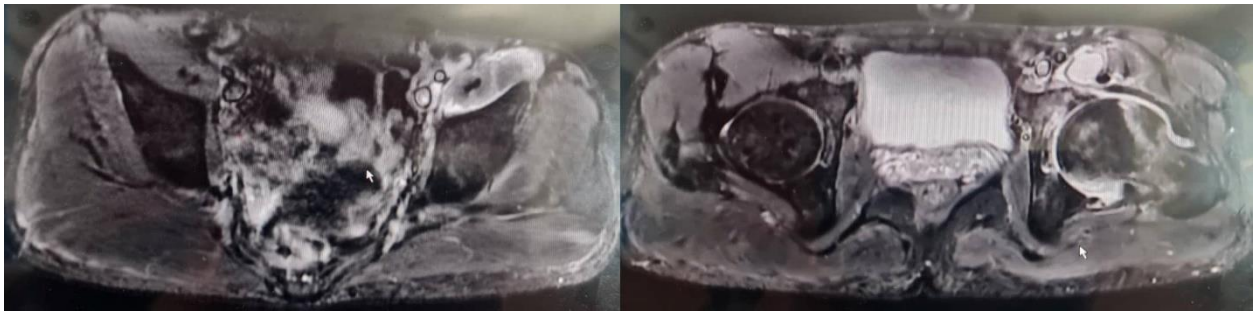

Figure 2. MRI findings

Discussion

This case illustrates the complexity and potential severity of brucellosis, particularly when complicated by focal infections such as acetabulofemoral monoarthritis and iliopsoas pyomyositis. The patient's history of zoonotic exposure and premature discontinuation of previous antibiotic treatment underscores the importance of proper management and follow-up in preventing relapse and complications. Despite receiving initial antibiotic therapy, the delayed response and progression to more severe focal manifestations emphasize the need for early recognition and aggressive treatment of brucellosis. This case also illustrates the diagnostic challenges posed by atypical presentations and the value of advanced imaging and PCR testing in identifying focal complications, ultimately guiding targeted therapeutic interventions.

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Our case of a 35-year-old male rancher with brucellosis complicated by acetabulofemoral monoarthritis, iliopsoas pyomyositis, and abscess shares several clinical features with other documented cases of brucellosis, while also highlighting some distinct differences. The patient's zoonotic exposure, resulting from contact with diseased cattle, is a consistent risk factor seen across many cases of brucellosis. Similar exposure was reported in cases such as Varikkodan et al. (16) and Ebrahimpour et al. (17), where infected livestock or the consumption of unpasteurized dairy products was identified as a major transmission route. This underscores the occupational risks associated with farming and livestock handling, particularly in endemic areas, and reinforces the need for preventive measures in at-risk populations.

Skeletal complications, which are a hallmark of brucellosis, were a significant feature of our case, consistent with other reports of osteoarticular involvement. The presence of chronic monoarthritis and osteomyelitis in our patient mirrors findings in cases such as Kazak et al. (18) and Ebrahimpour et al. (17), where patients also experienced joint and bone complications. This similarity highlights the predilection of Brucella for the skeletal system, further supported by imaging studies that confirm these diagnoses. The use of advanced imaging modalities and molecular techniques, such as PCR, proved critical in accurately diagnosing focal brucellosis in our patient, a strategy also seen in cases by Speiser et al. (19) and Zhou et al. (20).

Chronic course of the disease due to incomplete treatment or delayed diagnosis is a common feature in many cases, including this one. Early discontinuation of antibiotic therapy by the patient resulted in recurrence of symptoms and progression to more severe focal complications, similar to those reported by Zhang et al. (11) and Varikkodan et al. (16). These similarities emphasize the importance of strict adherence to treatment protocols and continuous follow-up to prevent recurrence and complications. However, there are also differences between our report and others. While some cases of brucellosis have involved life-threatening complications such as endocarditis (Zhang et al.) (11) or multisystem involvement (Miguel et al.) (21), our case was more associated with localized skeletal and soft tissue involvement. Although osteoarticular complications such as monoarthritis and pyomyositis are serious, they are usually less fatal than cardiovascular complications or neurobrucellosis. This difference could be related to factors such as host conditions, bacterial strain virulence, and timing of medical intervention.

Another key difference is the severity of outcomes. Cases with severe complications, such as endocarditis (21) and myocarditis (15), often resulted in fatal outcomes or significant long-term sequelae. In contrast, our patient experienced a favorable outcome, with complete resolution of symptoms following surgical intervention and prolonged antibiotic therapy. This difference can likely be attributed to the prompt surgical management of periarticular collections and the use of appropriate antibiotics, which prevented further systemic spread of the infection.

The similarities between our case and other documented cases emphasize the importance of recognizing occupational exposure and the frequent occurrence of skeletal complications in brucellosis. However, the differences in focal complications, disease progression, and outcomes underscore the diverse clinical spectrum of brucellosis, requiring individualized patient management. The integration of advanced diagnostic modalities and adherence to prolonged antibiotic therapy played a crucial role in the successful resolution of our patient's condition, reflecting a multifaceted approach to the management of this complex zoonotic disease.

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This case underscores the complexity and variability of brucellosis, particularly in patients with a history of occupational exposure and incomplete initial treatment. The development of rare focal complications, such as acetabulofemoral monoarthritis and iliopsoas pyomyositis, highlights the importance of early recognition and intervention to prevent chronicity and further systemic involvement. Our case demonstrates the critical role of advanced imaging and molecular diagnostics, such as PCR, in identifying atypical presentations and guiding effective treatment. Surgical intervention combined with a prolonged antibiotic regimen resulted in a favorable outcome, emphasizing the necessity of tailored therapeutic strategies and close follow-up in managing complicated cases of brucellosis.

Acknowledgment

We would like to express our gratitude to the patient for providing informed consent and allowing the publication of his case. We also extend our appreciation to the medical staff at our hospital for their dedicated care and management of this complex case. Special thanks to the radiology and laboratory teams for their crucial role in diagnostics, as well as to the surgical team for their expertise in managing the patient's complications. Lastly, we acknowledge the contributions of our colleagues who provided valuable insights during the follow-up and treatment of the patient.

[DOI: 10.22088/jbums.27.1.53]

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[DOI: 10.22088/jbums.27.1.53]