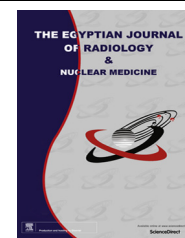




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CASE REPORT

Brucella osteomyelitis of the pubic bones



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KEYWORDS

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Abstract Brucellosis is a worldwide zoonotic disease that represents a serious public health problem in developing countries. Clinical manifestations are diverse and can affect any organ or body system. Osteoarticular disease is the most common localized form and has been reported in up to 80%. Pubic osteomyelitis is a very rare localization for Brucella infection and only 4 cases have been previously published. The clinical manifestations, laboratory and radiologic findings are non-specific. High index of suspicion is required to make an early diagnosis. Herein we report a case of Brucella osteomyelitis of the symphysis pubis with its radiologic features.

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1. Introduction

Brucellosis is a zoonotic infection that is transmissible to humans resulting in diverse and non-specific clinical manifestations (1,2). The disease can be acute or chronic and localized or diffused (2). The musculoskeletal system represents the most

common organ system involved in the localized form (1,3). Osteoarticular localization can present as spondylitis, arthritis, osteomyelitis and myositis (1,4).

Arthritis of symphysis pubis or pubic osteomyelitis is very rare in Brucellosis with only 4 previously reported cases. Osteomyelitis pubis caused by other pathogens and osteitis pubis, an inflammatory aseptic condition, can mimic Brucella osteomyelitis pubis (1). Therefore high index of suspicion is needed to reach the diagnosis. Serologic tests, blood cultures and culture of needle aspirate from the symphysis pubis are necessary to make a definite diagnosis.

Abbreviations: CRP, C reactive protein; CT, computed tomography; ESR, erythrocyte sedimentation rate; MRI, magnetic resonance imaging; PPD, purified protein derivative; T1WI, T1 weighted images; T2WI, T2 weighted images; WBC, white blood cell; WHO, World Health Organization

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2. Case presentation

A 72-year-old female presented for progressive pelvic pain irradiating to both groins and difficult ambulation over the last 6 months. She was also complaining of night sweats and

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weight loss. She has been seen by several physicians and received symptomatic treatments with no improvement and no previous medical problems. The physical examination was unremarkable. Laboratory tests revealed mild leukocytosis (white blood cell [WBC] count of $14,000/\text{mm}^3$) and mildly raised erythrocyte sedimentation rate (ESR 43 in 1st hour). Chest X-ray and abdominal ultrasound were normal.

Magnetic resonance imaging (MRI) of the lumbar spine demonstrated mild degenerative disk changes with no evidence of nerve compression. MRI of the pelvis demonstrated low signal on T1 weighted images (T1WI) at the iliopubic rami, subchondral marrow of the symphysis pubis and to a lesser extent on the ischiopubic rami bilaterally (Fig. 1a). There is corresponding high signal on T2 weighted images (T2WI) and enhancement after administration of Gadolinium. There was associated irregularity of the articular surfaces and a 2 cm ring enhancing collection in the joint space at the symphysis pubis (Figs. 1b and 2). These findings raised suspicion for infectious arthritis or pubic osteomyelitis.

Fine needle aspiration of the collection was done. Cultures of the specimen and mycobacterial identification were negative. The purified protein derivative (PPD) test was negative. Serologic tests for Brucella titers were positive ($>1/640$) for *Brucella melitensis* and *Brucella abortus*. The diagnosis of Bru-

cella osteomyelitis of the pubic bones was done. A more detailed history revealed previous intake of raw meat. The patient received streptomycin for 2 weeks and doxycycline for 3 months. After 3 months of treatment she was free of symptoms and her Brucella titer dropped significantly.

3. Discussion

Brucella is a zoonotic infection caused by Gram negative aerobic coccobacilli (1,2). Transmission to humans occurs usually through consumption of unpasteurized dairy products and less often through inhalation of infected aerosols or contamination of skin abrasions (1,2). The clinical presentation is variable and non-specific. Brucellosis can manifest as acute or chronic disease and may be associated with localized complications at any stage (2).

Any organ system can be involved and the most common localization is the osteoarticular system in active brucellosis (1,3). The frequency of skeletal involvement varies from 10% to 80% (1). A study conducted by Al-Shahed et al. on 224 patients with systemic brucellosis and radiologic evidence of osteoarticular involvement showed that 52.7% of patients had spinal disease, 36.2% had extraspinal involvement and 11.1% had both spinal and extra-spinal lesions (4). Arthritis,

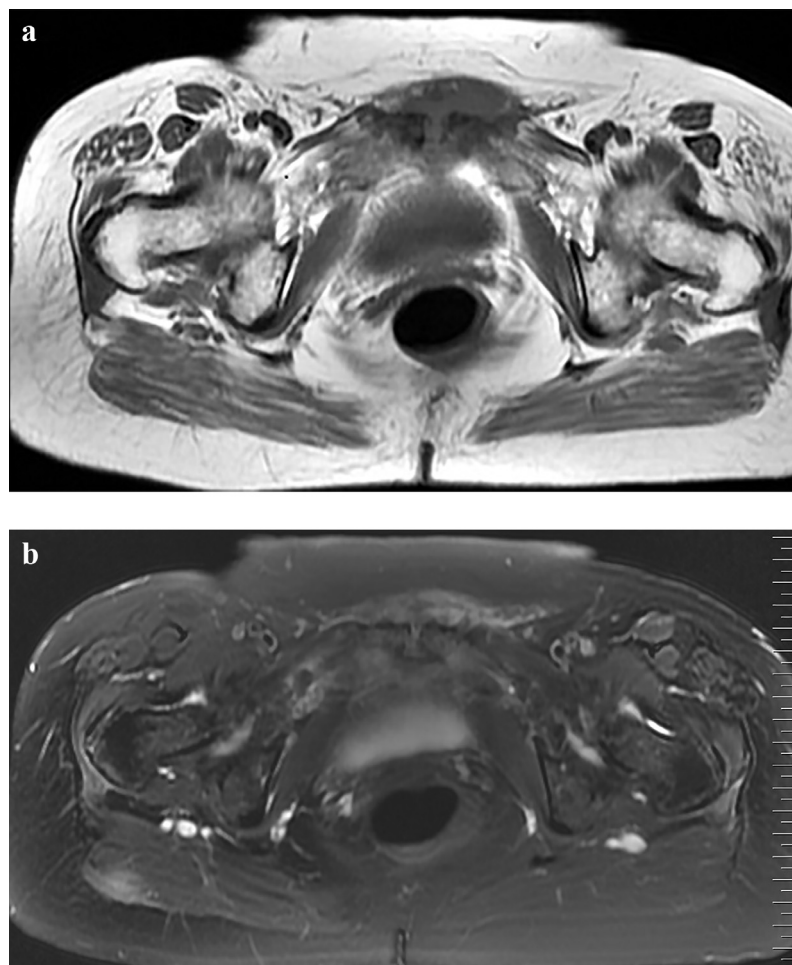


Fig. 1 (a, b) Axial T1-weighted image (TR/TE, 500/16.5) (a) reveals low signal intensity at the subchondral marrow of the symphysis pubis, along the ischiopubic rami bilaterally and within the joint space. Axial T2-weighted image (TR/TE, 2200/81.6) with fat suppression (b) shows high signal intensity along the ischiopubic rami, within the symphysis pubis joint and extending to the soft tissues anteriorly.

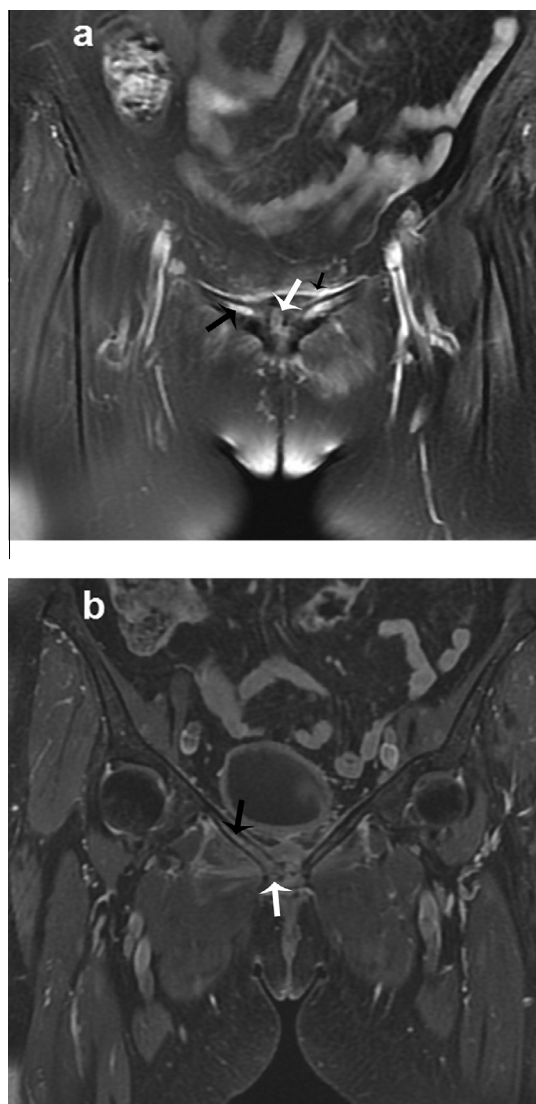


Fig. 2 (a, b) Coronal T2-weighted image (TR/TE, 3360/82) with fat suppression (a) demonstrates the abnormal hyperintensity along the iliopubic rami, subchondral marrow (black arrow) and within the joint space (white arrow) with surrounding soft tissue edema (small black arrow). Coronal post-contrast T1-weighted image (TR/TE, 700/17.6) with fat suppression shows marrow enhancement of the iliopubic rami and subchondral bone of the symphysis pubis (black arrow). Note also the irregularity of the articular surfaces (white arrow).

osteomyelitis and myositis represent the extra-spinal localization with the former accounting for the vast majority. Sacroiliac and weight bearing joints (hips, knees and ankles) are the most common sites of *Brucella* arthritis (1,4). However sacroiliitis and peripheral arthritis were the predominant sites of osteoarticular localization of *Brucella* in other series (5).

Radiographic findings are late findings in musculoskeletal *Brucella* (1,5). Computed tomography (CT) scan is valuable for evaluation of lytic and sclerotic lesions, joint destruction and abscesses. MRI is sensitive diagnostic tool to detect bone marrow changes, soft tissue spreading and collections (6,7). Radionuclide bone scan is the most useful for detecting the sites of osteoarticular involvement and early changes in the disease (5,6).

Pubic osteomyelitis or septic arthritis of the symphysis pubis is a very rare manifestation of brucellosis and only 4 cases were previously reported in the literature (1,8,9). The clinical presentation consists mainly of suprapubic pain and difficult ambulation (1,9,10). Laboratory tests reveal subtle changes as mild elevation in C reactive protein (CRP), ESR and white blood cell count (1,6,11).

Radiographic features, CT scan and bone scan findings are non-specific and were discussed in these published cases. Radiographs are normal early in the disease. CT scan demonstrates joint widening, lytic and sclerotic lesions. Bone scan showed increased uptake (8,9). In our case MRI of pelvis revealed abnormal marrow signal and enhancement in the subchondral bone extending to the superior and inferior pubic rami bilaterally. A fluid collection with rim enhancement was also noted in the joint space.

High index of suspicion is required to make an early diagnosis of *Brucella* pubic osteomyelitis. Osteomyelitis caused by other pathogens (bacteria or tuberculosis) and osteitis pubis, an inflammatory aseptic entity, can mimic this disease and present with similar clinical, laboratory and radiologic manifestations (1).

Cultures of needle aspirates of the symphysis pubis and blood cultures are required to exclude the presence of other pathogens (2,10,12). *Brucella* is difficult to isolate and the diagnosis usually relies on positive serology: titer > 1/160 or 4-fold rise in *Brucella* antibody titer in 2 weeks interval using standard tube agglutinin test (1,2,7). Serology is also useful for confirmation of cure and for detection of relapse (2). Several regimens are used for treatment of *Brucellosis*. World Health Organization (WHO) recommends a combination of doxycycline for 6 weeks plus streptomycin for 2–3 weeks or doxycycline for 6 weeks plus rifampicin for 6 weeks. Osteoarticular disease benefits from a prolonged treatment with doxycycline for 8 weeks or more (13).

Ethics committee approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of interest

The authors declared no conflict of interests.

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