Case Report

Paravertebral abscess formation and knee arthritis due to Brucellosis in a patient with rheumatoid arthritis

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Objective: To report a case of Brucellosis causing severe joint and vertebra destruction in a patient with rheumatoid arthritis (RA).

Setting: Ankara, Turkey.

Case report: A 47-year-old man with a known diagnosis of (RA) for 5 years developed paravertebral and epidural abscesses and vertebral fractures and nerve root compression due to brucellosis. The patient underwent surgery for L3-L4 vertebra stabilisation and medical treatment for knee arthritis.

Conclusion: It is important to be aware of the possibility of brucellosis in endemic areas, even among patients with a known diagnosis of RA presenting with clinical pictures that may be confused with a flare-up of the RA itself. Steroids and NSAIDs may have the potential to mask disease manifestations.

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Introduction

Brucellosis usually presents as a fever of unknown origin, but the disease may have polymorphic features affecting various body organs.¹ The locomotive system is one of the most commonly affected systems, with arthritis being the main feature, or presenting as a complication of the disease. Osteoarticular complications are important owing to their high prevalence and also associated sequela.^{2,3} Sacroiliitis and spondylitis are the most frequently seen osteoarticular involvement in adult patients.^{4,5} We report a case of a male patient receiving methotrexate and steroid therapy because of formerly diagnosed rheumatoid arthritis who developed highly destructive vertebral lesions and neurological deficits along with paravertebral and epidural abscesses due to brucellosis.

Case report

A 47-year-old male patient with a 5 year history of rheumatoid arthritis (RA) presented with a 2 week history of low-back pain and worsening right knee pain along with increased heat and swelling. He was under treatment with a combination of methotrexate (7.5 mg,

weekly), methyl prednisolone (5 mg bid) and indomethacin 25 mg bid. He complained of fever and profuse sweating, especially at night, and suffered from fatigue and lack of appetite for 2 months. He had a history of direct contact with animals and consumption of a kind of traditional cheese made from raw sheep milk.

The physical examination revealed grossly restricted movement of the right knee, minimal effusion and increased heat. Spinal movements were slightly restricted with bilateral paravertebral muscle contraction and extreme tenderness over the spinous processes of L3-L4 vertebrae. The right sacroiliac joint was painful during sacroiliac manoeuvres. His hands had deformities typical of RA. Neurological examination was normal except a slight sensory loss on the lateral and medial area of the left leg below the knee. The rest of the general physical examination was normal. The patient was hospitalised.

His total blood cell count, ESR and CRP were normal. Rheumatoid factor (RF) (Waller-Rose) was positive with a titer of 44.4 IU. Intradermal purified protein derivative test (PPD) for *M. tuberculosis* was negative. Rose Bengal test was positive and Wright's sero-agglutination test and Coombs' test for brucella were positive at titers of 1/320 and 1/1280, respectively. Brucella agglutination in the synovial fluid (SF)

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of the right knee was positive at a titer of 1/640. *Brucella melitensis* was isolated from the blood culture. SF culture was negative for brucella, blood and SF cultures in the Löwenstein-Jensen medium yielded no organism. Microscopic evaluation of the SF revealed leukocytes $1340/\text{mm}^3$ (90% neutrophils) and no microorganism.

A plain X-ray of the lumbosacral spine showed L3-L4 disc space narrowing with gross destruction of L3 and L4 vertebra with sclerosis. Plain radiographs of the right knee revealed gross destruction and a narrowed joint space, cyst formation and subchondral sclerosis of the adjacent bones of the joint (Figure 1). CT scan showed changes consistent with L3-L4 disc infection with osseous erosion, severe destruction and fragmentation. Magnetic resonance (MR) images of the lumbar spine revealed L3-L4 disc infection with paravertebral and epidural abscess. L3 and L4 nerve roots were compressed by fragmented vertebrae and abscess were also visible (Figure 2).

Based on these findings, brucellosis was diagnosed and a combination of 100 mg doxycycline bid and streptomycin 1 g daily i.m. was administered. Methotrexate and steroid therapy was stopped at the beginning of the antibiotic regimen. At the third week of the treatment muscle strength and sensory loss developed in the L3-L4 segments of the right leg. The patient underwent surgery and pus was surgically drained and L3-L4 vertebrae were stabilised using bony grafts and interpedicular screw fixation with a posterior approach. Culture of the drained material yielded *Brucella melitensis* and histological examination revealed a chronic non-specific inflammation. The patient was discharged 1 month after surgery. There was a slight loss of muscle strength (30%) in the dorsi-

Figure 1 Anterior-posterior radiograph of the knees shows gross destruction and narrowing of the joint space, cyst formation (arrow) and subchondral sclerosis (arrowhead) of the adjacent bones of the right knee joint

Figure 2 (A) T2 weighted sagittal image shows partial compression of L3 and total compression of L4 vertebral bodies, loss of intervertebral space, anterior paravertebral hyperintensity and smooth margined abscess formation (open arrow). (B) T1 weighted post gadolinium axial image at L4 vertebra level shows left anterior paravertebral abscess (open arrow) and obliteration of perineural tissues and compression of L4 nerve roots with contrast enhanced abscess (arrowheads)

flexion of the right ankle, ESR was 15 mm/h and CRP was negative.

Treatment with doxycycline bid with the combination of 1 g daily streptomycin i.m. was continued for 3 weeks and maintained for a further 3 months with doxycycline 100 mg bid and co-trimoxazole (960 mg bid). At the third month of treatment, rose-Bengal test for brucellosis was negative, he was able to walk with canes and no longer complained of specific disease symptoms and knee effusion. Methotrexate 7.5 mg weekly and indomethacin 25 mg bid was restarted.

Discussion

Osteoarticular complications occur in 11% to 72% of patients with brucellosis.^{3,6,7} Spondylitis is one of the most frequently affected sites in adults, accounting for between 20% to 60% of osteoarticular complications, the lumbar segment being the most commonly affected level, varying in frequency from 44% to 76% according to different studies.^{6,8–10} Although brucella spondylitis is considered a mild form of infectious spondylitis in some reports,^{11,12} in others, and in our case report, it caused highly destructive lesions.^{5,13} To our knowledge our case is the first reported case in which two different diseases, brucellosis and RA are associated.

The invasion of infection in vertebral brucellosis usually depends on the size of the inoculum, the virulence of the microorganism, and the immunity of the host.¹⁴ Patients with RA are susceptible to bacterial infection of the joints. The typical signs of septic arthritis may not be present and the disease may be polyarticular.¹⁵ Patients receiving systemic corticosteroids and non-steroid anti-inflammatory drugs (NSAIDs), which may mask signs of infection such as fever, leukocytosis and joint findings have diagnostic difficulties for probable joint infections. These factors may explain the low leukocyte count in the SF of our case and rapid destruction of the knee joint that was highly affected from the previous existing rheumatoid synovitis. We did not perform recurrent synovial aspiration because of the increased risk of secondary infections and the low incidence of brucella isolation. Brucella species are intracellular inhabitants, very difficult to isolate from body fluids in which they are freed intermittently.¹⁶ Thus it is usually recommended to isolate the microorganism from tissue cultures rather than body fluids. A CT guided aspiration of the paravertebral abscess may be a useful diagnostic technique but the procedure requires experienced interventional radiologists. Spinal brucellosis may mimic other diseases affecting the spine, particularly tuberculosis (TB).^{1,13,14} The most frequent level of involvement in TB is mid and lower thoracic spine, with more severe destruction of the affected vertebral bodies. Angulation deformity, paravertebral masses and osteoporosis are the most marked changes in vertebral TB.

Treatment of osteoarticular brucellosis has not been standardised and various procedures are described in the literature. Brucella antibody titers have proved to be the most accurate way of assessing therapeutic efficacy.^{5–7} The best results have been obtained with doxycycline and streptomycin treatment so far.³ Lifeso et al⁶ suggested that the duration of therapy was more important than the antibiotic agent itself. Surgical

drainage is usually recommended along with prolonged antibiotic treatment.^{3,6}

Conclusion

Brucellosis may cause severe joint and vertebra destruction in RA patients whose joints are affected with rheumatoid process and prone to infections. Steroids and NSAIDs have the potential to mask disease manifestations. It is important to be aware of the possibility of brucellosis in endemic areas, even among patients with a known diagnosis of RA presenting with clinical pictures that may apparently be confused with a flare-up of RA itself.

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