CASE REPORT

Spinal Brucellosis Masquerading as Pyogenic Spondylodiscitis: A Rare Case

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ABSTRACT

Brucellosis is a zoonotic infection secondary to Brucella spp. Musculoskeletal system is the most affinity site to be affected by this disease and the most preferred location of involvement is the lumbar vertebrae. The condition can manifest as focal or diffuse. A dietary history is a crucial clinical indicator towards the definite diagnosis. Plain radiography may be beneficialfor detecting focal disease; however, magnetic resonance imaging (MRI) is the most reliable and appropriate imaging for disease dissemination and spinal complications. We are reporting a 53-year-old lady who was initially diagnosed with pyogenic and tubercular spondylodiscitis. The original appearance of the patient and her radiological investigation led to the diagnosis of pyogenic spondylodiscitis, while the blood culture revealed Brucella melitensis. We would like to emphasise the relevance of clinical history and difficulties in the diagnosis of spinal brucellosis, as the radiographic appearance is non-specific and the organism is almost forgotten nowadays.

Keywords
spondylitis, discitis, brucellosis, spinal infection, zoonotic disease

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Received: 21th September 2020; Accepted: 15th May 2021

Doi: https://doi.org/10.31436/imjm.v21i1

INTRODUCTION

Brucellosis caused by *Brucella spp.* appears to be an important zoonotic disease in Southeast Asia. The prevalence of *Brucella melitensis* infection was 1% in Malaysia.[1] The most common mode of transmission from animal to human is via non-pasteurised dairy products. Musculoskeletal brucellosis is the most common system affected particularly to the lumbar vertebra. It can manifest as focal or diffuse lesion. In the focal type, it classically involves the anterior part of the upper end-plate of the disco-vertebral junction. The later affects the entire vertebral end-plate or vertebral body. The spread of the infection to adjacent disc and vertebral bodies occurs via the ligaments.

The most common clinical form of spinal brucellosis is fever. Constitutional symptoms such as malaise, lethargy and weight loss are often associated with fever. Neurological symptoms are often linked to spinal cord compression as the disease advances. Extreme back pain is the primary and initial reason for the patient to seek medical treatment.[2]

The diagnosis of spinal brucellosis is frequently late as clinical and radiological appearances are non-specific. However, the history of consumption of unpasteurised milk should not be overlooked when the laboratory results are confirmatory. A thorough clinical history which include consumption of unpasteurised milk supported by highly suspicious radiological findings should always have brucellosis as a differential diagnosis.

CASE REPORT

A 53-year-old lady with no known medical illness, a health care personnel at the local clinic, had low-grade fever along with chills and rigors for a week. It was associated with non-mechanical low back pain and shooting pain in the right lower limb. Her body temperature varies from 38

to 39 degrees Celsius. There was also vague painless swelling over the lower back. There were no sensory or motor deficits. Straight leg raising test was negative. Biochemical markers revealed a total white cell count of $19x10^9/L$, C-reactive protein (CRP) of 180mg/dL and erythrocyte sedimentation rate (ESR) of 90mm/hr, respectively. The Mantoux test was negative while the blood culture obtained after four days showed Gram-negative Bacilli.

The radiograph revealed minimal scoliosis of the lumbar vertebra with convexity to the right associated with sclerosis and irregularities of superior end-plate of L5 and reduction of the intervertebral disc height at L4 / L5 level. No prevertebral soft tissue swelling were reported [Figure 1]. MRI showed a decrease in the intervertebral disc height with abnormal signal intensities of L4 inferior end-plate and L5 superior end-plate. Early abscess formation characteristics involving the disc and posterior longitudinal ligament at this level were also seen [Figure 2].

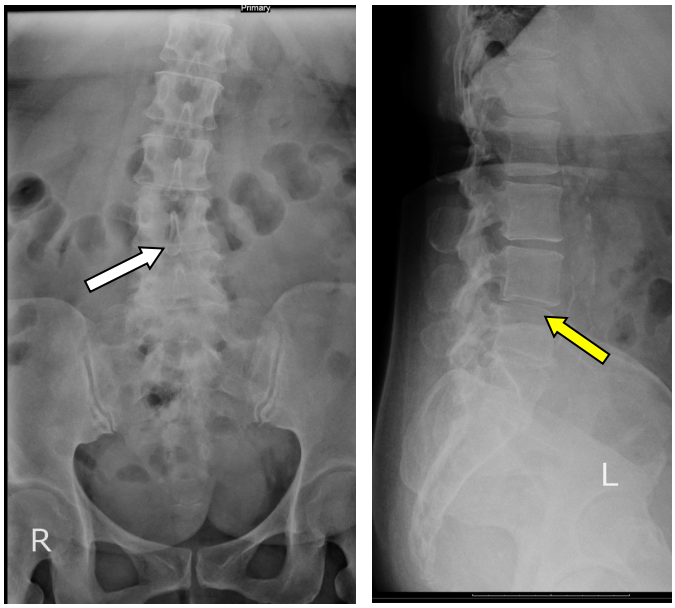

Figure 1: Lumbosacral X-Ray AP and lateral view reveals minimal sclerosis and irregularities of the superior end-plate of L5 (white arrow) with decreased inter-vertebral disc height at L4 / L5 level (yellow arrow)

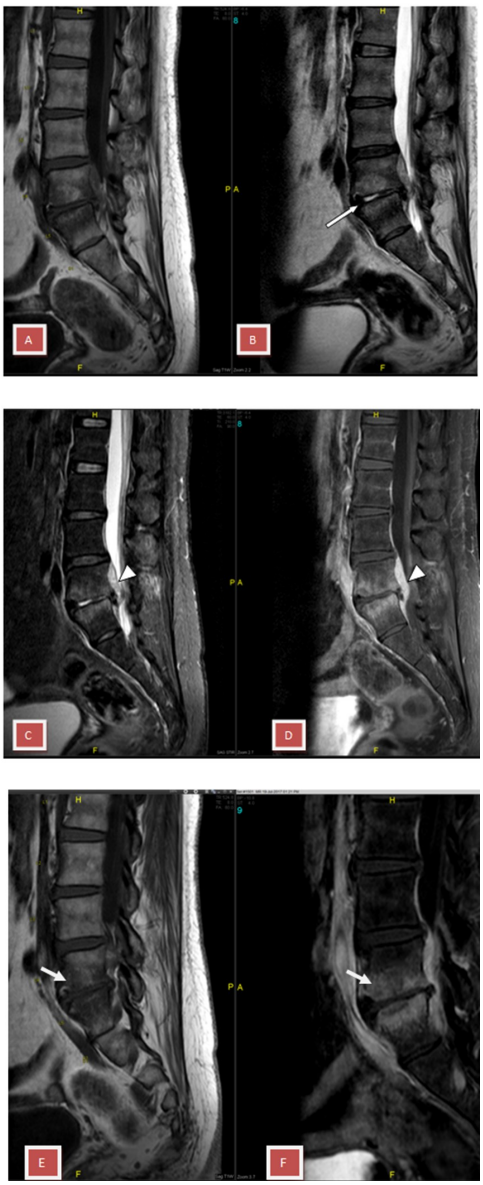

Figure 2: MRI Sagittal: A) T1W, B) T2W, C) STIR, D) POST GADO, E) T1 W, F) POST GADO

Figure A, B, C & D:
Reduction of intervertebral disc height with abnormal signal intensity within. It shows hypointense image on T1 W, hyperintense on T2 W, not suppressed on STIR (arrow) and enhanced post-contrast image.

Figure C & D:
Thickening of the posterior longitudinal ligament causing narrowing of the spinal canal at this level. It is hyperintense on STIR and homogenously enhanced post-contrast (arrowhead) in keeping with inflammation or early abscess formation.

Figure E & F:
Abnormal signal intensity with irregularities of the inferior end-plate of L4 and superior end-plate of L5, which is hypointense on T1W and heterogeneously enhanced post-contrast in keeping with involvement. No significant vertebral body height reduction.

The lesion was treated as pyogenic spondylodiscitis, and intravenous cloxacillin were empirically initiated. Despite antibiotics, her clinical symptoms persisted. Anti-tuberculous (TB) chemotherapy was added on day five of admission. However, the temperature and recurrence of symptoms worsened three days after TB treatment began. Brucella melitensis spp was revealed in the blood culture on day 10 of admission.

Upon further interview, the patient revealed a history of consuming non-pasteurised dairy products from a local farmer three weeks before the onset of symptom that had been missed by the initial clerking. Based on the sensitivity of blood cultures, intravenous doxycycline and gentamicin were initiated for ten days. Oral rifampicin as the anti-TB regime was continued for 4 weeks. The symptoms resolved entirely, and the septic parameters were normalised after 6 weeks of treatment.

DISCUSSION

The prevalence of human brucellosis has become rare due to proper pasteurisation of the dairy products. However, the condition should not be forgotten in our daily clinical practice. The most common microorganism is Brucella melitensis spp. with a prevalence of 10.7% and 14.5% reported in 2009 among goats and sheep in Malaysia. However, recent reports have shown that the prevalence of goat brucellosis is declining by approximately 1%.[3] Human brucellosis is a systemic condition, and it resides mainly in the reticuloendothelial system. The most common involvement of the disease is the musculoskeletal system where it has an affinity towards the anterior end-plate of vertebra due to its rich blood supply. Clinical history, physical examination and radiological findings are non-specific. Diagnosis is confirmed from the result of blood culture. However, Brucella spp. is a slow-growing microorganism that requires prolonged incubation period. Even though it is classified as aerobic, it requires an atmosphere containing 5 to 10% of carbon dioxide and enriched medium for optimal growth at 37oC. Consequently, the result will not be available until several days or weeks.[4]

The clinical symptoms of spinal brucellosis may occur after two or three weeks of initial exposure. The symptoms include fever, anorexia and weight loss. In spinal brucellosis, the most frequent manifestation is local spine tenderness, also the most initial signs that cause the patient to seek treatment. Neurological disturbances range from radicular pain and diminished sensory and motor power depending on the severity of the spinal cord or nerve involvement. The elevated inflammatory marker, like ESR, CRP and total white cell count, has always steered the clinician towards pyogenic infection rather than brucellosis due to its rareness.

The imaging findings of brucellosis are not precise. In spinal brucellosis, the anterior end-plate of vertebra appears to have a predilection for the lumbar spine. This is because of the rich supply of blood supply in this area. Further involvement of the entire vertebral end-plate, vertebra and adjacent disc will occur in delayed definitive treatment. Spreading into the adjacent vertebra can occur via ligaments and vascular communications, indicating the diffuse form of infection. Pedro Pons' sign, known as anterior superior end-plate erosion, which occurs together with rounding of the vertebral end at the level of deformity, is a typical radiological finding of brucella spondylitis.[4] Tuberculosis is also well known to involve the anterior end-plate of the vertebral body as an initial manifestation, making the differentiation between the two diagnoses more complicated.

Despite the challenges, the disease responds well with medical treatment which seldom needs surgical intervention. The World Health Organization (WHO) recommended oral tetracycline 500 mg 6 hourly or alternatively oral doxycycline 100 mg 12 hourly with a combination of aminoglycosides, either intramuscular (IM) streptomycin 14 to 21 days or intravenous/IM gentamycin 5mg/kg/day for 7 to 10 days. There are five regimes of antibiotic combination studied which do not indicate a significant difference between these regimes. However, most patients were treated with doxycycline and rifampicin with or without an aminoglycoside.[5] The current management for antibiotic was supported by the

study done by Smailnejad Gangi et al.,[6] which reported the similar regimen of doxycycline and rifampicin. Epidural and paravertebral abscess requires prolonged antibiotics up to 4 months. Decompressive surgery is only indicated for epidural abscess causing neurological deficit.[7,8]

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