



Case Reports & Case Series

Cauda equina syndrome due to *Brucella* spondylodiscitis and epidural abscess formation: A case report

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ABSTRACT

Brucellosis is an infection with a widening clinical disease spectrum, has been reported as the causative agent of lumbar spine complications but rarely accompanying CES Injury. We report a female patient with *Brucella* spondylodiscitis affecting the lumbosacral region resulting in CES due to epidural abscess formation. *Brucella* spondylodiscitis should be suspected in patients with unexplained neurological features and low back pain in endemic regions.

1. Introduction

1.1. Case report

Brucellosis is one of the most prevalent worldwide zoonotic diseases [1]. Spondylodiscitis is among the most common and severe complications of brucellosis, and the lumbar spine is the very commonly involved region [1]. Abscess formation in epidural space of the spinal column is a potentially serious consequence of brucellosis, which may lead to paralysis due to the accumulation of purulent materials, followed by spinal cord compression. Significant narrowing of the spinal canal that compresses the nerve roots of the spinal cord causes CES. Numerous causes of CES have been described. Infections in the spinal canal can produce malformation of the nerve roots and spinal column. Symptoms usually include severe back pain, unilateral or bilateral pain in legs, bladder disturbances, and rapid worsening muscle weakness. Patients with CES require fast treatment to prevent lasting damage leading to incontinence and perhaps permanent paralysis of the legs [1]. Here, we describe a patient who has developed CES following brucellar spondylodiscitis and epidural abscess formation affecting the lumbosacral vertebrae. The patient had satisfactory response to surgical and medical treatment.

2. The study

A 55-year-old female patient presented to Shahid Beheshti Hospital in Kashan, Iran, complaining of low back pain and paraparesis that

started a week prior. The patient reported urinary retention but no dysuria, hematuria, fever, chills, night sweats, weight loss, and any clinical signs of splenomegaly or hepatomegaly. Lumbar spine tenderness was noted on percussion. Gastrointestinal, urological, and cardiovascular examinations were carried out for diagnosis, and the results were negative. Laboratory tests such as complete blood count, erythrocyte sedimentation rate, C-reactive protein, liver and renal profiles, and serology testing were stated.

Routine laboratory studies restated leukocytosis was 23,200 cells per ml (normal 4200–11,000/ml), with 88.1% neutrophils, 6% lymphocytes, and 5.9% mixed. Hemoglobin was 9.8 g/dl. Her initial erythrocyte sedimentation rate (ESR) was 29 mm/first hours. C-reactive protein (CRP) was 86 mg/l. The rest of the blood biochemistry profile was normal except for a low potassium level of 2.7 mEq/l. The standard agglutination tube test and Coomb's Wright test for *Brucella* spp. were negative. Enzyme immunoassay was negative for *Brucella* IgM and IgG. Blood culture was negative after two weeks.

Lumbar region magnetic resonance imaging (MRI) was immediately conducted which demonstrated an inflammatory reaction to L4–L5 bodies and epidural abscesses between L4 and S1. The MRI report was indicative of increased signal intensity in the two lumbar vertebral bodies, narrowing the L5–S1 intervertebral disc spaces, and an enhanced hyperintense epidural mass located at the L5 and S1 levels (Fig. 1). Magnetic resonance imaging showed large extended bladder due to urinary retention (Fig. 2).

Infection of the lumbar vertebrae was a suspected diagnosis. Thus, the patient was transferred to the Department of Neurosurgery for an

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Fig. 1. Magnetic resonance imaging of the lumbar vertebra. (a) Increased signal intensity in the L4 and L5 vertebral body and an enhanced hyperintense epidural mass located at the L5 and S1 levels. (b) Epidural abscess (arrow).

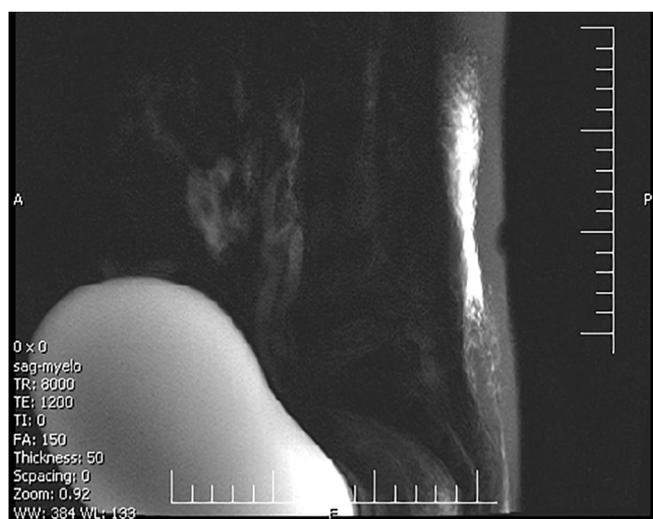


Fig. 2. Magnetic resonance imaging showing large extended bladder due to urinary retention.

operation on the lumbar spine to relieve the symptoms. She underwent laminectomy and foraminotomy on L3/L4/L5 and also discectomy of L5/S1. The abscesses and lesion were removed after obtaining samples for pathology and microbiology surveys. Pathological evaluation of the collected sample indicated the degenerative intervertebral disc with acute inflammation of the fibrous connective tissue. At day 7, *Brucella* spp. was isolated from the culture of the epidural abscess. The isolated bacteria were biotyped according to catalase and oxidase tests and urease activity of colonies. Species and biovar identification was performed by determination of the following characteristics: CO₂ requirement, H₂S production, growth in presence of dyes: basic fuchsin and thionin, slide agglutination test using monospecific antisera (A-M), and sensitivity to lysis using the Tbilisi phage. Further investigations based on the biochemical characteristics and phage-typing system identified the species as *Brucella melitensis* biovar-1. The patient received antibiotic therapy with doxycycline (100 mg every 12 h) and rifampicin (600 mg/day orally) for 3 months. She responded well to both surgical intervention and antibiotic therapy; the neurological signs and lower back pain resolved completely following the treatment. At two weeks after discharge, the patient regained normal urinary control and was able to walk unaided. Repeat MRI findings showed no abscesses or inflammatory reactions in the spine and adequate decompression. She was discharged four weeks after the operation and followed up in our

clinic for 3 months with no evidence of disease recurrence.

3. Discussion

Brucella epidural abscess formation is a rare manifestation of brucellosis that can cause major neurologic complications [2]. In the case of spinal cord impaction, the most frequent symptoms are low back pain, arthralgia, fatigue, fever, weight loss and anorexia, sweat, and lower urinary tract complications. In some cases, it can also cause abscess formation in paraspinous soft tissue. Generally, deficits affect both legs, but the pain may be asymmetric. In addition, urinary bladder and rectal sphincter paralysis frequently indicate the involvement of S3–S5 nerve roots. For patients with CES, an imaging study, preferably MRI, is generally necessary, and additional CSF examination could be useful [1]. *Brucella* spondylodiscitis accompanied with neurological manifestations should be differentiated from simple (noninfective) intervertebral disc prolapse, bacterial infections in endemic regions, the most common being spinal tuberculosis by *Mycobacterium tuberculosis*, staphylococcal osteomyelitis by *Staphylococcus aureus*, and spinal actinomycosis, osteoarthritis, and ankylosing spondylitis. Diagnosis of *Brucella* spondylodiscitis is based on clinical signs, laboratory findings, and imaging techniques. Prompt diagnosis and precise treatment may lead to the elimination of its significant clinical complications. Although serologic assays are useful for differential diagnosis of *Brucella* spondylodiscitis, serology tests may be negative during the first week and become positive as the disease progresses. Song et al. reported cervical spine brucellosis with epidural abscess, but negative serologic tests [3]. CRP and ESR have important roles in the diagnosis of most cases of brucellosis. Elevated values of CRP and ESR can be considered as useful indexes for diagnosing brucellosis complications. MRI imaging is a very sensitive and noninvasive imaging method, which should be considered as the first choice in the diagnosis of spondylodiscitis. MRI is useful for precise detection of the position of the lesion, the extent of the inflammatory process, and the exact location of possible epidural abscess. In the present case, the clinical findings were low back pain, paraparesis, and painful percussion of the lumbar spine with urinary retention. A case of *Brucella* spondylodiscitis was reported involving both the cervical and lumbar spine [4]. An uncommon case of *Brucella* spondylodiscitis at the lumbar spine in a patient with abdominal pain was also described by Cobbaert et al. [5]. In endemic areas such as Iran, clinicians should have a high index of suspicion for brucellosis as a cause of unexplained neurological deficits, even in the absence of fever or other systemic features of active brucellosis.

4. Conclusion

We described a patient with a rare CES detected by a constellation of symptoms, MRI, and positive culture. Her clinical symptoms considerably reduced after combined surgical intervention and therapy. She attained complete neurological recovery after three months of antibiotic therapy. We suggest urgent MRI in patients with lumbar back pain and urinary symptoms. Culture should be obtained when *Brucella* serological tests are negative.

Conflicts of interest

None.

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