CASE REPORT

Foot drop secondary to spinal abscess caused by brucellosis: A case report

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Abstract

Brucellosis is a systemic zoonotic disease with multiple organ involvement, which is caused by an intracellular coccobacillus. The disease is seen worldwide. It is usually transmitted via unpasteurised milk and other dairy products or infected animals. It often involves the musculoskeletal system, mostly the spine. The most common form of osteo-articular involvement in the spine is spondylodiscitis. Spinal abscess caused by the spread of the infection to the epidural space is extremely rare. In addition to antibiotics, early surgical treatment contributes to the patient's neurological recovery faster. It should be noted that abscess drainage and minimally invasive fusion methods may be required in cases where pyogenic sacroiliitis is observed. An interesting case with drop foot, negative pre-operative Brucella agglutination test and radiological spondylodiscitis accompanied by lumbar spinal abscess andABLE sacroiliitis is presented.

Keywords: Brucellosis, Sacroileitis, Spinal epidural abscess.

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Introduction

Brucellosis is a chronic granulomatous disease caused by Brucella spp. Annually, 500,000 new cases of brucellosis are diagnosed worldwide.[1] Although it is a rare disease in developed countries, it is still endemic in the Middle East, India, Mexico, the Caribbean, Eastern Europe, Central and South American countries, and in the Mediterranean basin (Portugal, Spain, Italy, Greece, Southern France, and North Africa), including Türkiye. In Türkiye, the estimated prevalence in humans is 0.59/100.000 (Table 1).[2]

The causative agent of the disease is a gram-negative, facultative intracellular coccobacillus that can affect many organs and systems. The most common forms in musculoskeletal involvement are spondylitis/ spondylodiscitis, arthritis, bursitis, osteomyelitis, and tenosynovitis. There are two important criteria in its diagnosis: 1) isolation of the Brucella species; 2) the presence of high titre antibodies specific to Brucella in the blood accompanied by clinical findings (1/160 in a standard tube agglutination test, ≥1/320 in the Coombs' test). The demonstration of seroconversion is another important criterion in the diagnosis.[3]

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Table-1: The number of newly diagnosed patients, the number of deaths, morbidity and mortality rates in Türkiye between 2008 to 2017 .

Years	Population	n	No. of Death	Morbidity Rate	Mortality Rate
2008	71.517.100	9,818	1	13.73	0.01
2009	72.561.312	9,385	0	12.93	0.00
2010	73.722.988	7,703	0	10.45	0.00
2011	74.724.269	7,177	0	9.60	0.00
2012	75.627.384	6,759	0	8.94	0.00
2013	76.667.864	7,225	0	9.42	0.00
2014	77.695.904	4,475	0	5.76	0.00
2015	78.741.053	4,173	0	5.30	0.00
2016	79.814.871	5,148	0	6.45	0.00
2017	80.810.525	6,457	0	7.99	0.00

Spinal involvement of brucellosis occurs mostly as spondylodiscitis. Spinal abscess due to Brucella was considered rare. After the development of sensitive imaging methods, spinal abscess has now become a common clinical finding.

The case of lumbar brucellar spondylodiscitis with foot drop is presented to strengthen awareness of this disease.

Case Report

The case was seen at the Kayseri State Hospital (Kayseri, Turkiye) in August 2020. A 43-year-old male patient presented with low back pain, which had persisted for a year and he had been experiencing difficulty walking for the previous two weeks. He and his wife lived in a rural area and were engaged in farming. The patient had a history of consuming unpasteurised homemade dairy products.

Neurological examination was normal except for the left foot drop (motor strength of the left tibialis anterior (TA) muscle: 2/5). Laboratory investigations showed high levels of C-reactive protein (CRP) [34, normal range: <5 mg/L] and a high erythrocyte sedimentation rate (ESR) [52 mm/h, normal range: 0–20 mm/hour]. The Brucella seroagglutination test was positive in a titer of 1:80. (Table 2).

There was a significant increase in trabeculation in the bony structures in the sacroiliac area and diffuse bulging at the

Table-2: Laboratory tests of the patient followed-up with a diagnosis of Brucella spinal abscess.

Date	White blood cell count	Sedimentation rate	CRP	Brucella agglutination
18.06.2019	Eki.15	77	29	0ca.80
24.06.2019	Tem.34	32	16	1/160
8.07.2019	Eyl.92	25	6.May	1/160

L4-5 level was observed on a lumbar CT. A Sagittal T2-weighted MR image revealed hypointense signals in the L5 vertebrae, indicating active infectious spondylodiscitis and cartilage endplate involvement, but the spinal cord showed normal signal intensity. Sagittal T2-weighted MRI and contrast-enhanced lumbar MRI revealed 1.0 x 1.5 cm of hypointense signal in the L5 corpus, indicating active infectious spondylodiscitis (Figure 1).

Due to the symptoms of spinal cord compression, it was decided to remove the abscess and perform spinal cord decompression (Figure 1). Preoperative biopsy was taken from both the bone marrow and the lesion. L4 full laminectomy was performed, the epidural abscess was evacuated, and the fibrous tissue under the left L5 root was excised and the root relaxed. Samples were taken for pathological and microbiological investigations. In the post-operative neurological examination of the patient, a rapid improvement in left drop foot was noticed. Compression on the left L5 root had subsided in the lumbar MRI taken in the early post-operative period. (Figure 2). The brucella agglutination test was 1:80 on the first post-operative day, and 1:160 in the second week of treatment.

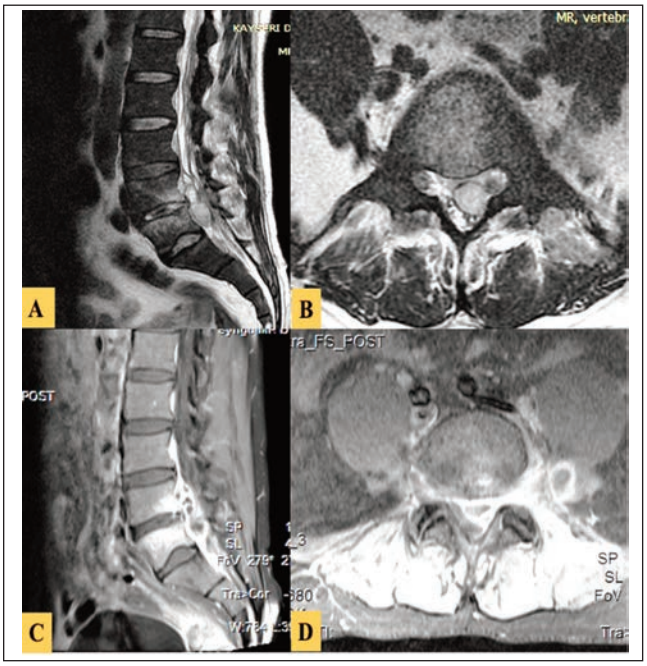

Figure-1: Figure 1: Preoperative lumbar MRI. A-B) T2W sagittal and axial, and C-D) T1W contrast-enhanced sagittal and axial images.

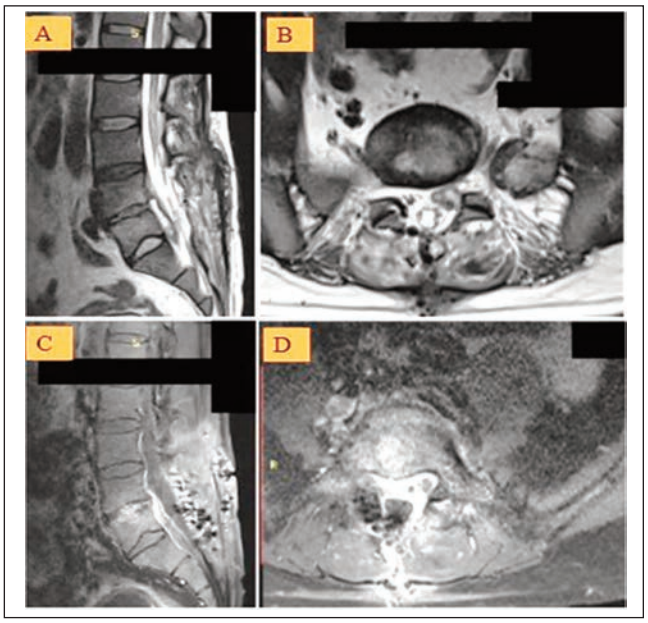

Figure-2: Post-operative lumbar MRI. A-B) T2W sagittal and axial, and C-D) T1W contrast-enhanced sagittal and axial images.

There was no positive culture.

A treatment plan consisting of intravenous Ceftriaxone (2x2000 mg twice daily), intravenous Streptomycin (1000 mg once daily), and oral Doxycycline (100 mg twice daily) was contemplated for a duration of six months. When the patient was not on oral medication during his hospital stay, Ceftriaxone was initially given intravenously for 10 days, Streptomycin was given intravenously for 21 days, and then oral Doxycycline was added and continued for six months. The patient's treatment process was also followed with CRP, ESR, and CBC. Streptomycin is primarily recommended in the literature.[4] Therefore, Streptomycin was given for 21 days. Side-effects of Streptomycin include hearing loss, dizziness, loss of appetite, and nausea; however, the present patient did not experience any drug-related side-effects. The present case report complies with the provisions of the Declaration of Helsinki (revised in 2013).[5] After parenteral therapy during his hospitalisation, oral Doxycycline was given for six months after discharge. Written consent was obtained from the patient for the processing of personal information and the publication of medical data.

Discussion

Osteoarticular involvement is the most common complication and includes spondylitis, sacroiliitis, and arthritis. Spondylitis is the most common clinical form in adults and a serious complication of brucellosis, which may occur more frequently in patients, who are not treated effectively or who are elderly. The lumbar spine is affected more frequently than the thoracic and cervical spine.

Sacroiliitis and arthritis due to Brucella infection usually occur in the first three decades of life, but spinal brucellosis often affects older people.[6]

Osteomyelitis frequently occurs as localised brucellosis in the vertebrae, with the lumbosacral area being the most frequent site. The occurrence of spondylitis in Brucella infection is approximately 10%. However, the occurrence of a spinal epidural abscess (SEA) is infrequent, and is reported in less than 1.5% of neurological complications, typically associated with spondylitis.[7] Tuberculous spondylitis, pyogenic osteomyelitis, degenerative diseases, spondylosis, intervertebral disc herniation, metastatic lesions, plasmacytoma, and actinomycosis should definitely be considered in the differential diagnosis of spinal brucellosis.

Brucella spondylodiscitis is rare and can lead to serious complications and even death, if not treated in time. In the face of a single non-specific symptom, clinicians can have difficulty making an accurate early diagnosis of Brucella spondylodiscitis. In some patients coming from endemic areas with non-specific symptoms mimicking brucellosis, essential examinations such as MRI and serological tests are necessary to rule out this condition. Spinal epidural abscess caused by brucellosis is a well-defined condition that usually represents acute infection of the thoracolumbar region.[8] Clinical findings in spinal brucellosis include spondylitis, spondylodiscitis, epidural abscess, paraspinal abscess, discitis, and vertebral collapse.[9]

A few case reports and retrospective studies have been published reporting epidural abscesses mainly in the lumbar and thoracic regions,[10] but a large paraspinal and epidural abscess is quite rare. In the present case, MRI and CT scans revealed osteomyelitis affecting L4, L5, and the sacrum, along with concurrent spondylodiscitis of the intervertebral disc and the development of an enhancing abscess in the epidural region. Treatment of spinal epidural abscess due to Brucella species is non-standard and controversial. Surgical treatment is indicated in cases of persistence or progression of neurological deficit, spinal instability and progressive vertebral collapse, and failure to respond to antimicrobial treatment. Therefore, early diagnosis and initiation of appropriate medical and surgical treatment are crucial. Lesions due to Brucella infection are complicated because they are generally encapsulated, elastic, moderately vascular, and adherent to neural structures. Iatrogenic contamination of the organism into the cerebrospinal fluid can lead to neuro-brucellosis.

Surgery is generally not required in spinal brucellosis, and the rate of surgical intervention varies between 0% and 41% in the literature.[11] In cases with no spinal compression findings and serious neurological symptoms, accompanied by clinical evaluation, long-term antibiotic therapy is preferred, regardless of the size of the abscess (small or large and voluminous).

In fact, when affecting the vertebrae, the infection may spread to the surrounding tissues, namely psoas muscles and paravertebral and epidural spaces. Therefore, paravertebral and/or epidural abscesses occur in spondylodiscitis and may mimic disc herniation, but they are also more frequently seen in tuberculous infections as compared with brucellosis.[11] Vertebral localisation of brucellosis has been accompanied by fever, pain, limited patient ambulation, spinal/peridural abscesses, and spinal cord compression (rarely leading to paraplegia). Occurrences of paravertebral abscesses complicating Brucella spondylitis have also been reported.[12]

Conclusion

Brucellosis-related spinal involvement is common. Spinal abscess should also be considered in the differential diagnosis in patients presenting with neurological findings and a mass in the spine, especially in regions where brucellosis is endemic. Surgical treatment accompanied by an appropriate combination of antibiotics is associated with successful clinical outcomes in patients who do not respond to medical treatment and have serious neurological damage.

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Author Contribution:
MO: Concept, design, data acquisition, analysis, interpretation and agreement to be accountable for all aspects of the work.
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