Case Report

Spinal brucellosis causing spondylodiscitis

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ABSTRACT

Introduction: and Importance: Brucellosis is a common prevalent zoonotic disease in developing countries including Somalia. Brucellosis may affect many organs. However involvement in the spine and paravertebral muscles is common and may lead to diagnostic challenges since it presents with non-specific symptoms.

Case presentation: Here we report 18-year old male patient who presented with low back pain, low grade fever, difficult voiding and progressive lower extremity weakness for 5 months. The pain was localized to the lumbar vertebra (tender on palpation) and radiating to both lower limbs. There was slight weakness on the left lower limb (muscle power 3+/5). There were no associated sensory symptoms or deep tendon reflex abnormality. But he had mild urine retention.

Lumbar magnetic resonance imaging (MRI) revealed spondylodiscitis. Rose-Bengal test was positive for brucellosis. A Brucella standard tube agglutination test was positive at a titer of 1:64. Given the test results and the imaging finding, the patient was diagnosed with Spinal brucellosis. He was treated with oral doxycycline (100 mg, two times daily) and Rifampicin (600Mg) orally once daily for 6 months. Streptomycin was added during the first three weeks. The patient had massive improvement after 3 months of treatment, (the patient’s symptoms almost disappeared).

Clinical discussion: Spinal brucellosis is characterized by the involvement of the vertebral column, interspinal spaces, and/or paraspinal areas. Its subacute or chronic forms typically affect the spinal column. Spinal brucellosis may cause Spondylitis, spondylodiscitis or epidural abscess causing spinal compression. This case presented with spondylodiscitis and was successfully treated without the need for surgical intervention.

Conclusions: Brucella spondylodiscitis, though uncommon and challenging, it should be kept in mind in the differential diagnosis of patients presenting with chronic back pain and lower extremity weakness living in endemic areas like Somalia. The duration of treatments should be prolonged in patients with worse physical condition.

1. Introduction

Brucellosis is a worldwide bacterial zoonotic disease both humans and animals. Members of the genus Brucella that are gram-negative, facultative intracellular, coccobacilli, non-motile, and non-spore-forming bacteria are responsible for the disease [1,2]. Brucellosis is endemic in Somalia. However exact epidemiological figures are not established. Epidemiological information on brucellosis diseases is scarce in the nation despite the significance of livestock and the health risk that infectious diseases pose to both people and their animals [3].

One of the most commonly affected areas by brucellosis among all the musculoskeletal forms is the spinal vertebra. According to studies, 2–54% of Brucella infections involve the spine, with the lumbar spine being the most often involved [4]. Depending on where the infection is located, a range of spinal brucellosis symptoms might be seen. Spondylitis, discitis, spondylodiscitis or epidural abscess can all be caused by brucellosis [5]. Chronic Brucellosis may present with back pain which may be associated progressive neurologic symptoms such as lower limb weakness and sphincter dysfunction depending on disease progression. Patients with progressive back pain and neurologic symptoms in endemic areas need proper neurologic assessment and spinal imaging to consider spinal brucellosis [6].

We report a young male patient with Brucella spondylodiscitis
causing lower limbs weakness and urinary retention who was successfully treated through medical treatment.

2. Case Presentation

18-year-old male living in a rural area presented to our hospital outpatient clinic with back pain, low grade fever, difficult voiding, and progressive lower extremity weakness for 5 months. He had no significant past medical or surgical history. There was no family history of spinal brucellosis. The pain was localized to the lumbar vertebra (tender on palpation) and radiating to both lower limbs. There was slight weakness in the left lower limb (MRC power scale 3+/5). There were no associated sensory symptoms or deep tendon reflex abnormalities. He had mild urinary retention.

Lumbar magnetic resonance imaging (MRI) revealed an increase in signal intensity in a T2-weighted image at the L4 vertebral body, indicating inflammatory brucellar spondylodiscitis, as well as a slightly linear hyperintense at the conus medullaris level, indicating inflammatory myelopathy. No contrast enhancement was seen, which is consistent with spondylodiscitis (see Figs. 1 and 2).

A Brucella standard tube agglutination test was positive at a titer of 1:64 and also the patient was positive in Brucella Rose Bengal test. Based on the test results and the MRI findings, the patient was diagnosed with lumbar spondylodiscitis due to brucellosis. There was no indication for surgical treatment per neurosurgery consultation. The patient was treated with doxycycline (100 mg two times daily) and Rifampicin (600 mg once daily) for 6 months. Streptomycin was also added in the first three weeks of treatment (1 g daily). After three weeks of hospital admission, he was discharged after massive improvement (back pain and fever disappeared, muscle strength improved to 4+/5 on the MRC scale). At 3 months’ follow-up in the outpatient clinic, muscle power was back to normal function and also urinary symptoms disappeared. The patient was followed up for 6 months in both neurology and infectious diseases outpatient clinics. No relapse has been seen since then. This case has been reported in line with the SCARE 2020 criteria [19].

3. Discussion

Human brucellosis, a zoonotic disease caused by brucella, a Gram-negative coccobacilli. It is widely distributed throughout the world, but the Mediterranean basin, West Asia, the Middle East, South America, Central America, and sub-Saharan Africa have the highest burden of the disease [7]. Direct transmission may occur by contact with infected animals, and indirect transmission occurs via the consumption of unpasteurized milk products [8].

Human brucellosis can affect any organ or system. Through the lymph nodes, Brucella might enter the bloodstream and then slowly spread throughout the body [9]. The most frequent complication is osteoarticular involvement, which includes arthritis, spondylitis, and sacroiliitis, and which involves numerous non-specific clinical symptoms such as fever and chills, discomfort in the muscles and joints, headaches, and sweating [4]. However, several diseases that affect the spine, including TB and pyogenic osteomyelitis, share similarities with the radiological diagnosis of spondylitis [10].

Spinal brucellosis may present as back pain, usually in the lumbar area that may radiate to the legs, low grade fever, sweating and weight loss. The neurological manifestations depend on the degree of disc, vertebral body inflammation, and compressing effect on the spinal canal. The symptoms have chronic progression over weeks to months [11–13]. In the present case, the clinical manifestations were sweating, fever, and back pain, difficult urination, and lower extremity spastic weakness (MRC power scale 3+/5) over 5 months. There were no associated sensory symptoms or deep tendon reflex abnormalities, but there was associated mild urine retention.

Diagnosis can be challenging due to overlap of symptoms with other chronic disorders, including TB and pyogenic osteomyelitis. The diagnosis of spinal TB is based on primarily depended on the clinical presentation of the diseases, history of contact of infection source, spinal imaging findings, and laboratory investigation [14]. MRI is the imaging modality of choice for the diagnosis of spinal brucellosis because of its high diagnostic sensitivity. Spinal MRI may show spondylitis, spondylodiscitis, or epidural abscess with spinal canal narrowing [15]. The differential should include pyogenic osteomyelitis of the spine, degenerative disc herniation, epidural abscess, and traumatic spondylolisthesis. In the present case, lumbar MRI showed increased signal intensity in T2-weighted image at L4 vertebral body and disc representing Brucella spondylitis with inflammatory myelopathy representing spondylodiscitis. The spinal MRI did not show any features of spondylololithiasis, disc herniation, or epidural abscess.

The Brucella serology frequently yields positive results and has a high diagnostic value. The reference procedure used by the World Health Organization (WHO) is the Brucella agglutination test. The Rose Bengal Test is also rapid, sensitive, and specific. It is done with the help of a Rose Bengal-stained bacterial solution in a buffered acid media [16]. The patient was positive for the Rose Bengal test and also had a standard tube agglutination test at a titer of 1:64. The patient had the clinical picture, supporting MRI findings, and positive serological tests which all indicate spinal brucellosis.

Fig. 1. (A) Sagittal T2-weighted image showed signal intensity at L4 vertebral body representing brucellar spondylitis inflammatory with slightly linear hyperintense at conus medullaris level indicating inflammatory myelopathy (blue and orange arrows) at these levels slightly disc bulging and facet arthropathy are noted. (B) Axial T2-weighted image showed slightly thickening of the nerve roots (white arrows). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)
Rifampicin for six weeks and doxycycline antibiotic treatment are recommended by the World Health Organization [17]. Numerous studies support the idea that the length of therapy should depend on the health state and disease of the patient. The length of the treatment ranges from six weeks to six months [9,18]. The patient was treated with doxycycline (100 g, two times daily) and Rifampicin (600 mg once daily) orally for 6 months. Streptomycin was added during the first three weeks of treatment. After three weeks of hospital admission, he was discharged after significant clinical improvement. At 3 months’ follow-up in the outpatient clinic, muscle power was back to normal function and also urinary retention disappeared. The patient was followed up for 6 months in both the neurology and infectious diseases outpatient clinics. No relapse has been seen since then.

4. Conclusion

Clinicians have a diagnostic challenge with diagnosis of spinal brucellosis. However it should be considered in the differential diagnosis especially for patients living in endemic areas. Spinal MRI and serological tests are useful for its diagnosis. The outcome is excellent when diagnosed and treated early in the course of the disease.

Ethical approval

Ethical approval is not required for case reports in our institution.

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Author contribution

A.A.A involved in patient care, collected data, and performed a literature review. MSH performed literature, wrote the manuscript and also contributed to the patient care. A.A.OS involved in diagnosis. AAS involved research design. All authors reviewed and approved the final version for submission.

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Abdirahim Ali Adam, the corresponding author.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of competing interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104782.

Fig. 2. Lumbar magnetic resonance images. (A) Sagittal T2-weighted image hyperintense, hypointense on T1-weighted image in L4 vertebral bodies (red arrows) corresponding inflammatory bone edema of brucellar spondylitis from 18 years old having Clinical and laboratory feature of brucellar spondylitis. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)
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