



## Case Report

## Spinal brucellosis causing spondylodiscitis

Abdirahim Ali Adam<sup>a,\*</sup>, Mohamed Sheikh Hassan<sup>b</sup>, Ahmed Adam Osman<sup>c</sup><sup>a</sup> Department of Infectious Diseases, Mogadishu Somali Turkish Training and Research Hospital, Somalia<sup>b</sup> Department of Neurology, Mogadishu Somali Turkish Training and Research Hospital, Somalia<sup>c</sup> Department of Radiology, Mogadishu Somali Turkish Training and Research Hospital, Somalia

## ARTICLE INFO

## Keywords:

Spondylodiscitis  
Chronic back pain  
Brucellosis

## 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

\* Corresponding author.

E-mail address: [abdrahm5d5@gmail.com](mailto:abdrahm5d5@gmail.com) (A. Ali Adam).<https://doi.org/10.1016/j.amsu.2022.104782>

Received 30 July 2022; Received in revised form 19 September 2022; Accepted 19 September 2022

Available online 23 September 2022

2049-0801/© 2022 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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, is 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

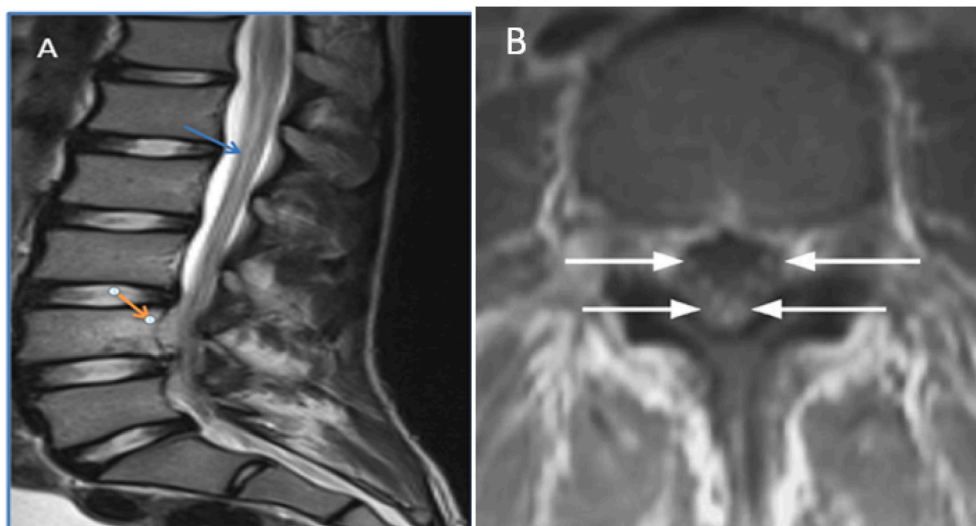
unpasteurized milk products [8].

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].

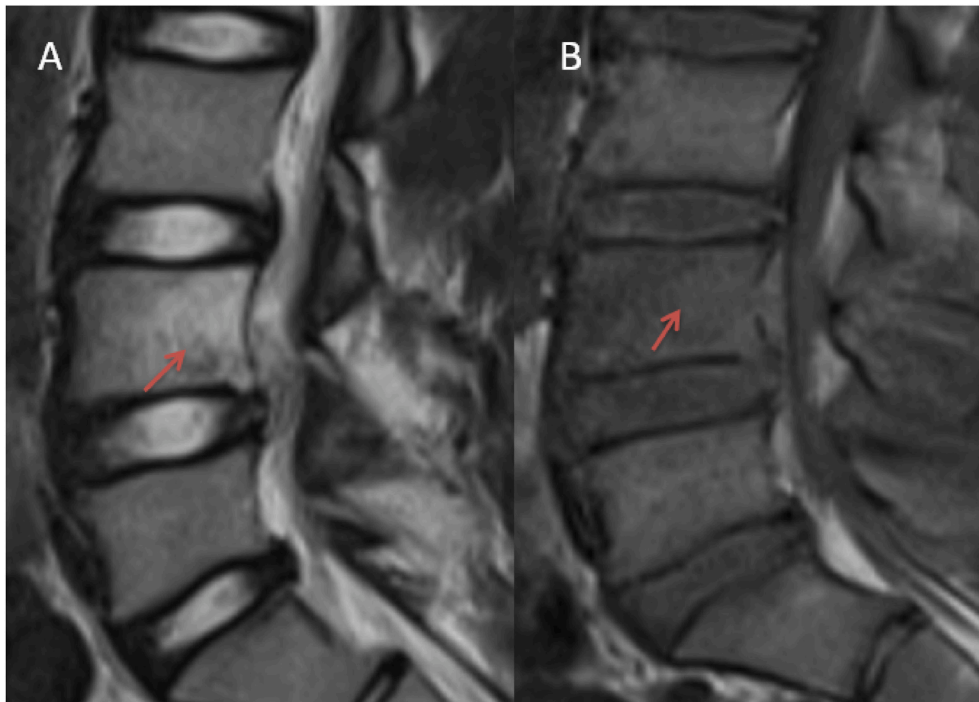
Spinal brucellosis may present as back pain, usually in the lumbar area that may radiate to the legs, low grade fever, sweating and weight loss. The neurological manifestations depend on the degree of disc, vertebral body inflammation, and compressing effect on the spinal canal. The symptoms have chronic 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 spondylolithiasis. In the present case, lumbar MRI showed increased signal intensity in T2-weighted image at L4 vertebra body and disc representing Brucella spondylitis with inflammatory myelopathy representing spondylodiscitis. The spinal MRI did not show any features of spondylolithiasis, 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 vertebra 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 arthrosis 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.)



**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 brucellarspondylitis. (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.

#### Funding

None.

#### 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.

#### Registration of Research Studies

Non-applicable

#### Guarantor

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.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### 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>.

## References

- [1] L.R. Walker, Brucella, in: D.C. Hirsh, Y.C. Zee (Eds.), *Veterinary Microbiology*, Blackwell Science, USA, 1999, pp. 196–202.
- [2] World Health Organization, Joint FAO/WHO Expert Committee on Brucellosis: Sixth Report. WHO Technical Reports Series, No. 740, WHO, Geneva, 1986.
- [3] A.A. Hassan-Kadle, A.M. Osman, M.A. Shair, O.M. Abdi, A.A. Yusuf, A.M. Ibrahim, R.F. Vieira, Rift Valley fever and Brucella spp. in ruminants, Somalia, *BMC Vet. Res.* 17 (1) (2021 Dec) 1–6.
- [4] N. Malavolta, M. Frigato, M. Zanardi, R. Mule, L. Lisi, S. Gnudi, M. Fini, Brucella spondylitis with paravertebral abscess due to Brucella melitensis infection: a case report, *Drugs Exp. Clin. Res.* 28 (2–3) (2002 Jan 1) 95–98.
- [5] L. Oulkadi, B. Amine, S. Rostom, R. Bahiri, Spinal pain revealing brucellar spondylodiscitis: a case report, *The Egyptian Journal of Internal Medicine* 33 (1) (2021 Dec) 1–6.
- [6] K.B. Lim, Y.G. Kwak, D.Y. Kim, Y.S. Kim, J.A. Kim, Back pain secondary to Brucella spondylitis in the lumbar region, *Annals of Rehabilitation Medicine* 36 (2) (2012 Apr 30) 282–286.
- [7] M. Doganay, B. Aygen, Human brucellosis: an overview, *Int. J. Infect. Dis.* 7 (3) (2003 Sep 1) 173–182.
- [8] Pohl R, Gilman R, Miller GA, Pachucki K. Muonic Hydrogen and the Proton Radius Puzzle. *arXiv preprint arXiv:1301.0905*. 2013 Jan 5.
- [9] E. Alp, M. Doganay, Current therapeutic strategy in spinal brucellosis, *Int. J. Infect. Dis.* 12 (2008) 573–577.
- [10] K. Nas, A. Gur, M.S. Kemaloglu, M.F. Geyik, R. Cevik, Y. Buke, A. Ceviz, A.J. Sarac, Y. Aksu, Management of spinal brucellosis and outcome of rehabilitation, *Spinal Cord* 39 (2001) 223–227.
- [11] A. Zormpala, E. Skopelitis, L. Thanos, C. Artinopoulos, T. Kordossis, N.V. Sipsas, An unusual case of brucellar spondylitis involving both the cervical and lumbar spine, *Clin. Imag.* 24 (5) (2000 Sep 1) 273–275.
- [12] M.S. Hassan, N. Osman, B. Ali, A young male with an unusual presentation of Guillain-Barré syndrome (GBS) mimicking stroke: a case report, *PAMJ-Clinical Medicine* 8 (4) (2022 Jan 10).
- [13] M.M. Mohamed, I.H. Ali, M.E. Ağca, M.S. Hassan, M.F. Osman, Ali II, M. F. Mohamud, 49-years-old women with unusual presentation of severe hypokalemia mimicking Guillain-Barré Syndrome: a rare case report, *Annals of Medicine and Surgery* 79 (2022 Jul 1), 104021.
- [14] G.D. Applebaum, G. Mathisen, Spinal brucellosis in a southern California resident, *West. J. Med.* 166 (1) (1997 Jan) 61.
- [15] M.R. Roushan, S. Ebrahimipour, Z.M. Afshar, A. Babazadeh, Cervical spine spondylitis with an epidural abscess in a patient with brucellosis: a case report, *The Journal of Critical Care Medicine* 5 (3) (2019 Jul 1) 103–106.
- [16] P. Yagupsky, Detection of Brucellae in blood cultures, *J. Clin. Microbiol.* 37 (11) (1999 Nov 1) 3437–3442.
- [17] M.J. Corbel, World Health Organization. Food, Nations AOotU, Epizootics IOO. Brucellosis in Humans and Animals, World Health Organization, 2006. WHO/CDS/EPR/2006.7.
- [18] K. Nas, A. Gür, M.S. Kemaloglu, M.F. Geyik, R. Cevik, Y. Buke, A. Ceviz, A.J. Sarac, Y. Aksu, Management of spinal brucellosis and outcome of rehabilitation, *Spinal Cord* 39 (4) (2001 Apr) 223–227.
- [19] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, A.J. Beamish, A. Noureldin, A. Rao, B. Vasudevan, B. Challacombe, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 84 (2020 Dec 1) 226–230.