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Case Report Open Access

Acute Spinal Syndrome Due to Thoracic Vertebral Brucellosis: A Case Report

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Abstract

Introduction: Brucellosis is a zoonotic infection caused by brucella species. It is an endemic disease in the Mediterranean region. It may affect different organ systems with osteoarticular involvement in the form of peripheral arthritis, sacroiliitis and spondylitis being the most common and serious complication of the disease and it may lead to severe and irreversible sequelae. The diagnosis of brucellosis may be delayed due to the subtle nature of the illness, and it require isolation of the bacterium from blood or tissue sample for absolute diagnosis The World Health Organization guidelines for the treatment of human brucellosis discuss two regimens, both using doxycycline for a period of six weeks, in combination with either streptomycin for two to three weeks or rifampin for six weeks.

Case Presentation: We are reporting a case of a 67 year-old man with chronic mid-back pain which was misdiagnosed as muscle spasm but evolved into an acute spinal syndrome due to brucellar spondylodiscitis.

Conclusion: Physicians should keep a high index of suspicion and broad differential diagnosis of brucellosis as a cause of chronic back pain in appropriate parts of the world where it is considered as endemic infection, and should tailor regimen and duration of treatment according to the severity of the disease, clinical response and brucella titers.

Keywords: Brucellosis; Spondylodiscitis

Introduction

Brucellosis is a multisystem infection caused by an obligate aerobic gram-negative, facultative intracellular coccbacillus bacteria of the genus brucella. A high prevalence of infection is well recognized in certain geographic areas such as Mediterranean region, Middle East and Latin America. The transmission of infection to humans occurs through the consumption of infected unpasteurized animal-milk products, through direct contact with infected animal parts, and through the inhalation of infected aerosolized particles. It is traditionally described as a disease of protean manifestations, and it may affect different organ systems with osteoarticular disease being universally the most common complication. The absolute diagnosis of infection requires isolation of the bacteria from blood or tissue sample, or a positive serology for brucella agglutinin test in the absence of bacteriologic confirmation. The two regimens stated by WHO guidelines are the most popular treatment worldwide, with the duration being tailored according to the clinical situation.

Case Presentation

A sixty seven year-old man with no previous medical illnesses presented to our Emergency Department with a severe sudden onset mid-back pain and inability to move his legs. He had a history of dull aching mid-back pain of eight weeks duration for which he sought medical advice from different physicians and was diagnosed as having non-specific muscle spasm. Despite receiving Non-Steroidal Anti-Inflammatory Drugs (NSAID's) and paracetamol his pain didn't improve. He went for a Chinese massage and during his first session the masseuse did a back thrust upon which he developed a severe sudden mid back pain that radiated anteriorly and distally to his legs as an electric shock. He became unable to move either leg. He was immediately transferred to the hospital.

Further questioning in the Emergency Department revealed a recent history of four kilogram weight loss over the last eight weeks, and visiting a rural area where he had ingested raw dairy products. He denied any history of fever, cough, sweating, dizziness, nausea, vomiting, abdominal pain, diarrhea, arthralgia, other recent travel or contact with sick people.

On examination he was alert and oriented but in severe pain. His temperature 36.9°C, BP 170/100 mmHg RR 19/minute and Pulse 78 bpm. Mental status and cranial nerve examinations were normal. Neurological exam was significant for decreased sensation two inches below the tip of the xephoid bone (T8 dermatome); positive bilateral straight leg raise test; normal tone and 5/5 power at ankles, knees and hips except for give-way weakness due to pain. Deep tendon reflexes were normal (2/4 all over) and Babinski's sign were absent. The patient had Grade D on Frankel scale.

An MRI of the spine showed destruction of the endplates of the T8 and T9 thoracic vertebrae with loss of vertebral height and involvement of the inter-vertebral disc associated with retro-pulsion and indentation of the spinal cord. It also revealed a prevertebral collection suggestive of abscess formation (Figure 1).

His lab investigations revealed, Hb 12.4 g/dl, WBC 11.6×10^3/cu.mm, Platelet count: 248×10^3/cu.mm, ESR 60 mm for the first hour, H.CRP 32.42 mg/L.

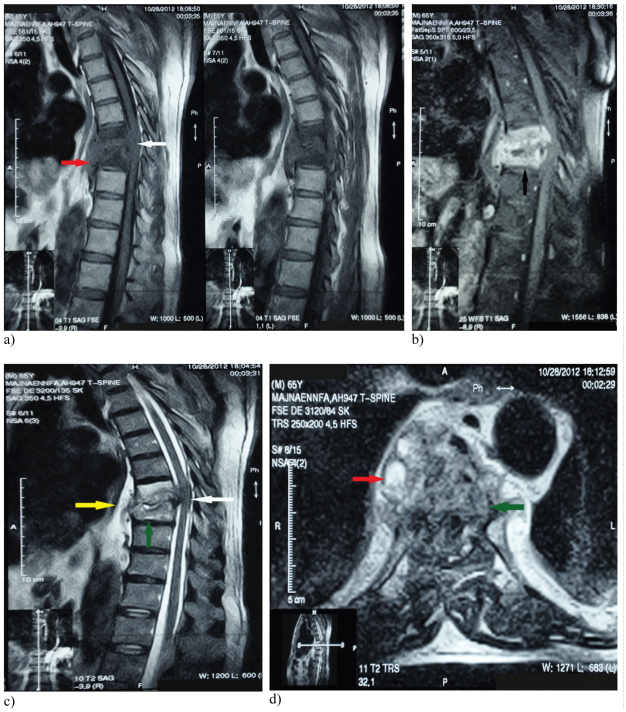

Figure 1: Thoracic spine MRI a) T1-weighted MR showing prevertebral hypointensity (red arrow), and retro-pulsion of destructed adjacent endplates of T8-T9 level with their fragmented intervertebral disc causing spinal cord indentation (white arrow). b) T1-weighted MR with IV contrast showing the enhancement of the destructed vertebrae (black arrow). c) T2-weighted MR showing the prevertebral collection as hyperintensity (yellow arrow). d) T2-weighted axial view of the destructed vertebral body (green arrow).

A presumptive diagnosis of acute spinal cord syndrome was made with potential etiologies including: Pott's disease, pyogenic abscess and malignancy. The patient was given 16 mg of dexamethasone intravascularly and was started on empiric vancomycin and imipenem/cilastatin. Twenty four hours later, he underwent an emergency surgical debridement and cage screw reconstruction of T8-T9 vertebrae. Tissue stain and culture were taken during surgery which was positive for brucella species (Figure 2) and negative for acid fast bacilli. Histopathology showed chronic nonspecific inflammation. Serum brucella antibody titers were positive for *B. Abortus* (1:640) and *B. Melitensis* (1:320).

Postoperative day one neurologic exam revealed significant improvement of sensation, 5/5 power of upper and lower limbs, 2/4 DTR's and normal anal sphincter tone. (Grade E on Frankel scale).

The patient's antibiotic regimen was changed to rifampin 300mg and doxycycline 100 mg twice daily. His serial brucella Ab titers four months after starting the antibiotics were: *B. Abortus* (1:160) and *B. Melitensis* (negative). The treatment regimen was extended for a total of six months, after which his laboratory testing returned to normal level and follow up imaging studies showed healing.

The patient was followed in the clinic for one year and had no residual neurological deficit or back pain. He returned to his baseline functional status with regards to activities of daily living.

Discussion

Brucellosis is a zoonotic multisystem infection that is found endemically in many developing countries all over the world. It is caused by different brucella species with *B. melitenses* being the most common and virulent [1]. The main route of transmission to human is via contact with infected animals or their products, and it is unusual to be transmitted from person to person [2].

The disease typically affects adults especially in middle age, with a lower incidence in children and the elderly. It has a wide spectrum of clinical presentations ranging from asymptomatic infection to severe fatal illness. The acute febrile disease presents with the insidious onset of fever, night sweats, pathognomonic moldy odor, arthralgia, myalgia, low back pain, weight loss, fatigue, headache, dizziness, depression and anorexia. It is considered a chronic illness if the clinical manifestations persist for more than one year after the diagnosis of brucellosis is established [3,4].

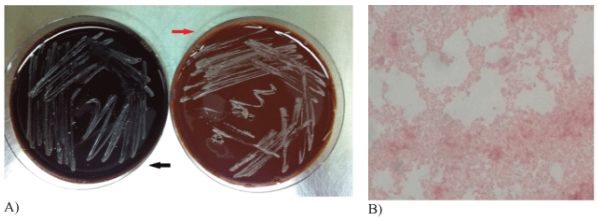

Figure 2: A) Brucella species growing on sheep blood agar (red arrow) and chocolate agar (black arrow) after 48 hours growth in 5-7% CO_2 as small, non-pigmented, nonhemolytic, entire and convex colonies. B) Gram stain smear of brucella showing the characteristic small, coccobacillary morphology.

Brucellosis may be complicated with osteoarticular disease which frequently involves the sacroiliac joints and large joints of the legs. Spondylitis is considered one of the most serious complications, with the lumbar region most commonly involved followed by the thoracic and cervical regions [5,6].

The subtle nature of symptoms and signs of brucellosis is the main obstacle in making a diagnosis early in the course of the disease. In this case the patient had the five criteria suggested by Turgut et al. for diagnosing brucellosis, which are: a) Clinical picture compatible with brucellosis. b) Positive serology for brucella. c) Radiologic findings suggesting infectious vertebral involvement. d) Isolation of brucella species in blood or tissue sample. e) Histological findings consisting of chronic nonspecific inflammation and non-caseating granulomatous tissue [7].

Many radiologic modalities such as plain radiography, Radionuclide bone scan and Computed Tomography (CT) scan may show the osteoarticular involvement of the disease, though; Magnetic Resonant Imaging (MRI) is considered the modality of choice as it is more sensitive in revealing spinal cord or nerve root compression as well as Para-vertebral soft tissue involvement [8]. Although the MRI findings can mimic other spinal diseases such as Pott's disease, pyogenic spondylitis and metastatic cancer; [9] certain MRI features such as soft tissue involvement without abscess formation, facet joint involvement [9] and Pedro Pons' sign (anterior superior end erosion, which occurs together with rounding of the vertebral end and level deformity) may favor the diagnosis of brucellar spondylitis [10].

Although the treatment of brucellar spondylitis is still an area of controversy. There is consensus however, that mono therapy or treatment for less than six weeks is unlikely to be successful. Treatment of uncomplicated brucellosis is usually achieved using a six-week course of either doxycycline 100 mg orally twice daily with streptomycin 1 gm IM once daily for the first 14-21 days OR doxycycline 100 mg orally twice daily with rifampin 600-900 mg orally once daily [11,12]. Brucellar spondylitis requires at least a twelve-week course with two agents and the period can be extended according to the resolution of clinical symptoms or MRI findings. [13,14]. Relapse occurs in 5-15% of cases, mainly in the first six months following completion of treatment [15].

Surgical intervention should be considered if there is spinal instability, persistence or progression of neurologic deficit, vertebral collapse, or localized abscess leading to severe weakness [16,17].

Conclusion

Brucellosis can be complicated with severe and serious sequelae such as brucellar spondylitis. We reported this case to emphasize the importance of holding a high index of suspicion and maintaining a broad differential diagnosis of back pain to prevent severe complications, and to underscore the need for an extended duration of treatment in cases of osteoarticular involvement.

References

1. Colmenero JD, Jiménez-Mejías ME, Sánchez-Lora FJ, Reguera JM, Palomino-Nicás J, et al. (1997) Pyogenic, tuberculous, and brucellar vertebral osteomyelitis: a descriptive and comparative study of 219 cases. Ann Rheum Dis 56: 709-715.
2. Mesner O, Riesenberg K, Biliar N, Borstein E, Bouhnik L, et al. (2007) The many faces of human-to-human transmission of brucellosis: congenital infection and outbreak of nosocomial disease related to an unrecognized clinical case. Clin Infect Dis 45: e135-140.
3. Pappas G, Akritidis N, Bosilkovski M, Tsianos E (2005) Brucellosis. N Engl J Med 352: 2325-2336.
4. Young EJ (1995) Brucellosis: current epidemiology, diagnosis, and management. Curr Clin Top Infect Dis 15: 115-128.
5. Bosilkovski M, Krteva L, Caparoska S, Dimzova M (2004) Osteoarticular involvement in brucellosis: study of 196 cases in the Republic of Macedonia. Croat Med J 45: 727-733.
6. Geyik MF, Gür A, Nas K, Cevik R, Saraç J, et al. (2002) Musculoskeletal involvement of brucellosis in different age groups: a study of 195 cases. Swiss Med Wkly 132: 98-105.
7. Turgut M, Turgut AT, KoÅŸar U (2006) Spinal brucellosis: Turkish experience based on 452 cases published during the last century. Acta Neurochir (Wien) 148: 1033-1044.
8. Harman M, Unal O, OnbaÅŸi KT, Kiymaz N, Arslan H (2001) Brucellar spondylodiscitis: MRI diagnosis. Clin Imaging 25: 421-427.
9. Ozaksoy D, Yücesoy K, Yücesoy M, Kovanlikaya I, Yüce A, et al. (2001) Brucellar spondylitis: MRI findings. Eur Spine J 10: 529-533.
10. Karabay O, Gurel K, Sirmatel O, Sirmatel F (2007) Medical image. Brucellar spondylitis (Pedro Pons' sign). N Z Med J 120: U2782.
11. Hasanjani Roushan MR, Mohraz M, Hajiahmadi M, Ramzani A, Valayati AA (2006) Efficacy of gentamicin plus doxycycline versus streptomycin plus doxycycline in the treatment of brucellosis in humans. Clin Infect Dis 42: 1075-1080.
12. Pappas G, Papadimitriou P, Christou L, Akritidis N (2006) Future trends in human brucellosis treatment. Expert Opin Investig Drugs 15: 1141-1149.
13. Colmenero JD, Ruiz-Mesa JD, Plata A, Bermúdez P, Martín-Rico P, et al. (2008) Clinical findings, therapeutic approach, and outcome of brucellar vertebral osteomyelitis. Clin Infect Dis 46: 426-433.
14. Alp E, Doganay M (2008) Current therapeutic strategy in spinal brucellosis. Int J Infect Dis 12: 573-577.
15. Ariza J, Bosilkovski M, Cascio A, Colmenero JD, Corbel MJ, et al. (2007) Perspectives for the treatment of brucellosis in the 21st century: the Ioannina recommendations. PLoS Med 4: e317.
16. Colmenero JD, Reguera JM, Martos F, Sánchez-De-Mora D, Delgado M, et al. (1996) Complications associated with Brucella melitensis infection: a study of 530 cases. Medicine (Baltimore) 75: 195-211.
17. Solera J, Martínez-Alfaro E, Espinosa A (1997) Recognition and optimum treatment of brucellosis. Drugs 53: 245-256.