International Journal of Healthcare Sciences ISSN 2348-5728 (Online)
Vol. 3, Issue 2, pp: (657-662), Month: October 2015 - March 2016, Available at: www.researchpublish.com

Spinal Abscess: A Rare Complication of Brucellosis in Children

[1]Ashwaq Altawil, [2]Roaa Zailiae, [3]Mohammed Alshehri, [4]Abdulsalam Alawfi

[1,2,3,4] Department of Pediatrics, Division of pediatric infectious diseases[1],King Fahad Medical City, Riyadh, Saudi Arabia.

Abstract: **Brucellosis is an infectious disease, frequently encountered in some areas of our country. It may involve multiple organ system of human body. However, spondylitis, diskitis, paravertebral and epidural abscesses are rare complications of brucellosis in children, it is more prevalent in adult patients with prolonged illness prior to treatment.**

Case report: A Four year old boy presented with a history of prolonged fever, lower back pain and inability to walk. He was previously hospitalized for brucellosis after a history of animal contact one year back which had been treated with rifampin and co-trimoxazole for six weeks with good outcome. At this hospital presentation, the magnetic resonance imaging (MRI) showed destructive lesion over L5-S1 with paravertebral abscess formation. Both blood culture and paravertebral pus collection were culture positive for Brucella. The patient was successfully treated by surgical drainage and combination antibiotic therapy which comprised gentamicin rifampicin and co-trimoxazole.

Conclusion: Brucella spinal infection is a rare complication in children. A high index of suspicion is required with confirmation of the pathology by use of MRI and aspiration of abscess contents. Paravertebral abscess draining plus the administration of gentamicin, rifampicin and co-trimoxazole resulted in an excellent therapeutic outcome in our patient.

Keywords: **spinal abscess, Brucellosis.**

1. INTRODUCTION

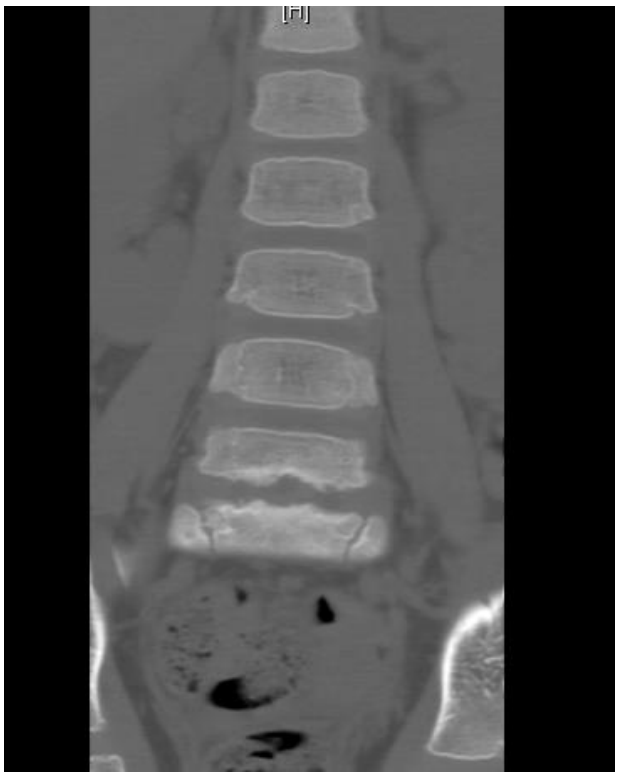
Brucellosis is a worldwide zoonosis. Animal contact and consumption of unpasteurized milk is a common mode of transmission of the disease to human beings. *B. abortus* and *B. melitensis* are the two common human pathogens. They enter human body through the skin, the GI tract and the conjunctiva (1). Brucellosis in children comprises 3-10% of reported cases worldwide, with a heavier burden in endemic areas. Osteoarticular form of brucellosis is relatively common focal form of the disease in adult patients but not so common in children(2). We report a case of culture confirmed paravertebral abscess in a 4 year old boy.

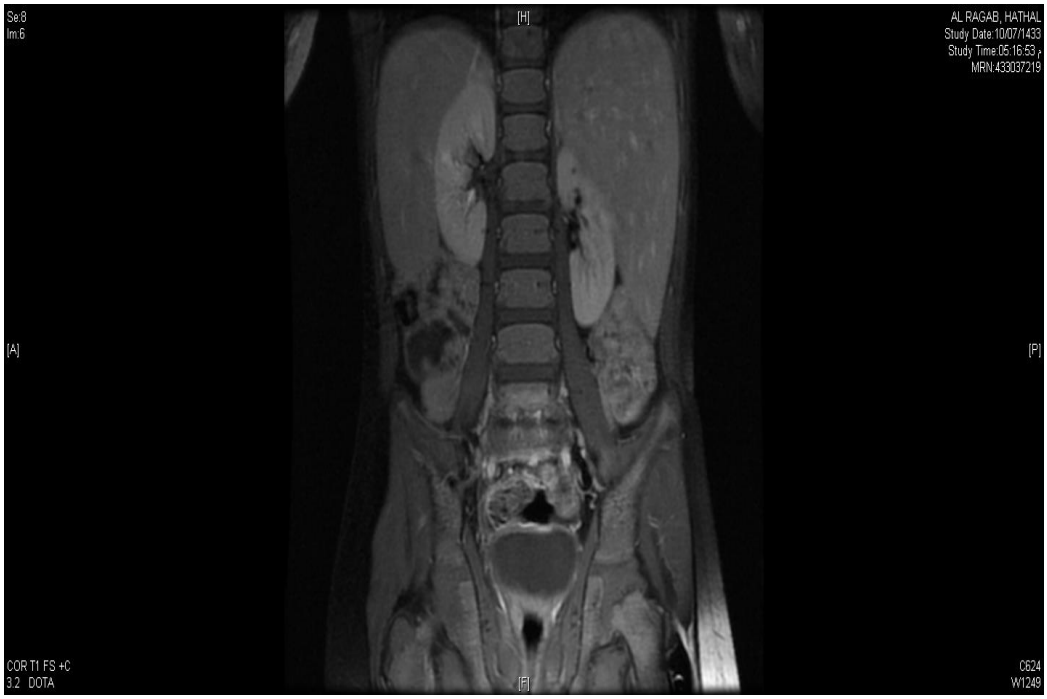
2. CASE REPORT

A four year old boy presented (was brought to Emergency Department by his parents) to the Emergency Department at our hospital with a complaint of lower back pain and inability to walk (17 days duration) and fever for the past 10 days. He had a past history (one year before this presentation) of hospitalization for brucellosis after admitting to ingestion of raw milk. For the latter episode, he was treated with rifampicin and co-trimoxazole for a total of 45 days. The patient unfortunately did not return for follow up.

On admission the patient's temperature was 39^0C. He was unable to walk due to pain in the back; he was irritable but conscious, alert, with no signs of meningeal irritation, no lymphadenopathy, no skin rash nor any joint swelling and no hepatosplenomegaly. Neurological examination showed normal tone, power and reflexes with limping during walking.

The laboratory investigations showed: white blood cell count of 7.1 x 10^3 /dl, with lymphocytes 64.8%, hemoglobin of 11.8g/dl, platelets 381 10^9/l, ESR of 50mm/H, CRP 38.4 mg/l. Brucella serology done by ELISA (both IgM and IgG) was positive. Contrast-enhanced MRI of the lumbosacral spine demonstrated partial volume loss within the L5/S1 intervertebral disc associated with peripheral paradiskal contrast enhancement, vertebral end plate irregularity, and paraspinal/epidural irregular contrast enhancement was consistent with spondylitis/diskitis. The epidural enhancement was dominant in the left anterolateral aspect of the L5/S1 spinal canal associated with areas of central non-enhancement indicating early abscess formation (figures 1-3).





Figures 1, 2 and 3: MRI images of spine of the patient showing destructive lesion over L5-S1 with paravertebral collection

The spinal surgery team was consulted and who performed open surgery to drain the abscess which was sent to the Microbiology Laboratory for analysis. The laboratory reported isolation of Brucella within 5 days of specimen submission. Blood culture also was positive for Brucella after 72 hrs of incubation which was susceptible to cotrimoxazole and rifampicin, tetracycline ,streptomycin and ciprofloxacin.

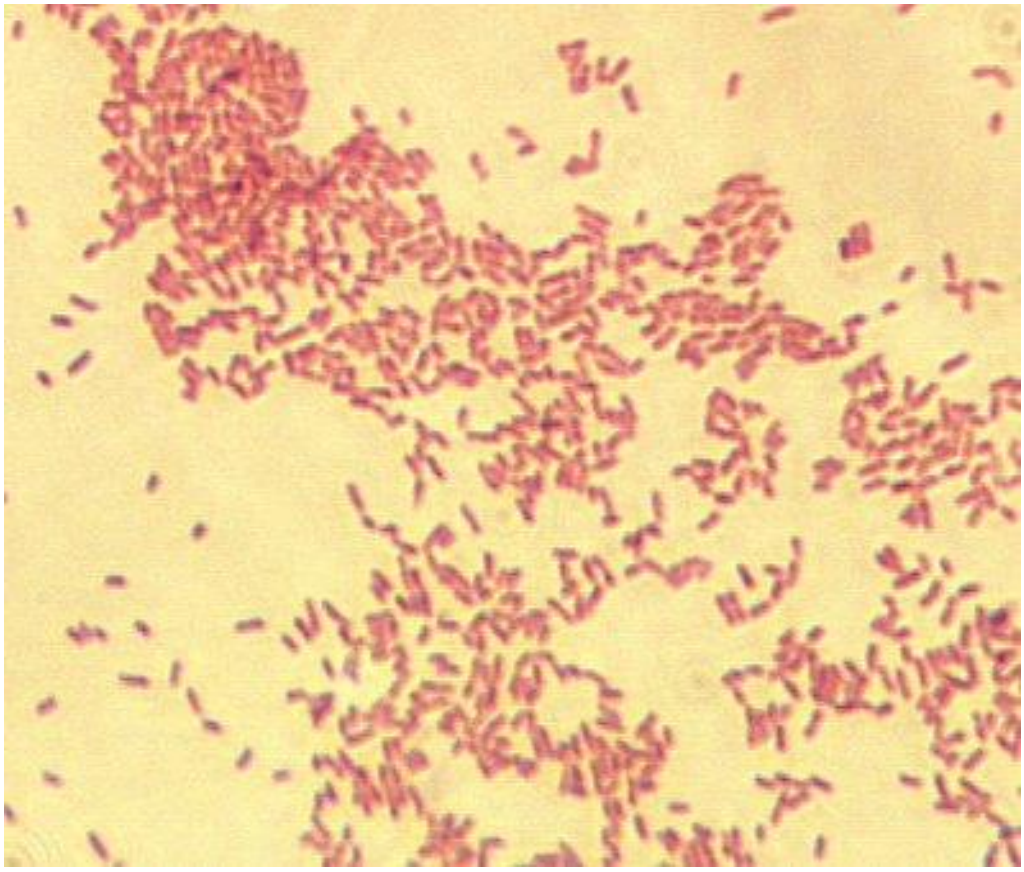


Figure 4: Gram stain image of *Brucella species* from blood culture specimen.

The patient was placed on a triple antibiotic regimen comprising gentamicin rifampicin and co-trimoxazole. The gentamicin was discontinued after two weeks whilst rifampicin and co-trimoxazole. Repeat blood culture was negative. The patient showed a dramatic clinical improvement, the fever subsided in 14 days. After a week of treatment, the patient started to walk and later was discharged home to continue on oral co-trimoxazole and rifampicin. The patient was seen in Infectious Diseases Clinic at our hospital after three months. He was in good health with normal gait and the follow up CT scan showed evidence of resolution of infection (figure 5). he was continued on oral antibiotics for total duration of one year.

Figure 5

3. DISCUSSION

Brucellosis is a multi-system disease transmitted to humans mainly through the consumption of non-pasteurized dairy products from infected animals (camels, cows, sheep, goat or others) (3, 4, 5). It is an infectious disease, frequently encountered in some areas of our country. It may involve multiple organ system of human body. However, spondylitis, diskitis, paravertebral and epidural abscesses are rare complications of brucellosis in children; it is more prevalent in adult patients with prolonged illness prior to treatment.

In this case report, we isolated Brucella in culture from blood and from the paravertebral abscess collection and it is the first case report in the English literature which shows isolation of the causative organism from both sites.

Conclusive evidence of hematogenous spread of the pathogen to skeletal site and causing a paravertebral abscess is unusual whilst occasional cases of spinal involvement in children have been mentioned in the literature. Spinal brucellosis in children is uncommon and as indicated in a review from Turkey, only 3 cases have been reported in children from 452 cases of spinal brucellosis (14).

There is a case report of a ten year old boy diagnosed to have brucellosis spondylitis (15), and another report of 6 year old boy who presented with acute torticollis and found to have brucella retropharangeal abscess (16).

Although some authors have advocated that pharmacological therapy is sufficient for spinal abscesses caused by Brucella, (8) surgical intervention is mainstay of treatment in cases presenting with neurological deficits. (10)

Antimicrobial treatment of brucellosis should be initiated immediately following surgery, or if already started, should be continued after the surgery (8, 10). The most ideal anti-brucellosis therapy recommended is gentamicin for 2-4 weeks followed by rifampicin and doxycycline. This needs to be administered to children above 8 years for at least 6 weeks. Cotrimoxazole is administered in children less than 8 years instead of doxycycline. (17) In our patient we used a triple antibiotic regimen comprising gentamicin rifampicin and co-trimoxazole with extremely good outcome.

Neurological manifestations in brucella infection is seen in 2-5% of the patients in the form of meningitis, encephalitis, myelitis, radiculo-neuritis, brain and spinal abscesses (5,7). It has been reported that epidural abscesses make up less than 1.5% of neurological complications, and it is generally accompanied by spondylitis (5). The spine is the most common bony structure involved in brucellosis with reports showing a wide prevalence range (2-53%) (3, 7, 8). Brucella spondylitis is a serious complication of brucellosis (10) and was first described by Kulowski and Vinke (11, 13). Brucella spondylitis mainly involves the lumbar region (6) but can also affect the thoracic and cervical regions (11, 4).

Although plain x-rays, bone scan and computerized tomography (CT) are used for the diagnosis of brucellosis (4), the most advanced diagnostic radiological tool is MRI (3,9,12). MRI is useful in revealing the spondylo-diskitis, root compression and its surrounding anatomical structures. There is no specific finding in MRI for brucella spinal infections (13). In our case we used MRI and this was substantiated with the isolation of the pathogen from affected anatomical site. Recognition of spinal abscesses is difficult because of the non-specific presentations and a high index of suspicion is necessary for the diagnosis of spinal brucellosis in children (6, 8). Laboratory tests such as the ESR are non-specific and not useful indicators for the diagnosis of brucellosis or spondylitis (5).

4. CONCLUSION

Brucellosis can present with spinal abscess in children. This is uncommon and a high index of suspicion is required with confirmation of the pathology by use of MRI and aspiration of abscess contents. Management requires surgical drainage and use of combination antimicrobial therapy according to age of child. In this case report, diagnosis was confirmed by isolation of Brucella from blood culture and abscess fluid. Paravertebral abscess draining plus the administration of gentamicin, rifampicin and co-trimoxazole resulted in an excellent therapeutic outcome.

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