

Diagnosis and Management of a Rare Case of Infective Spondylodiscitis caused by *Brucella abortus*

PANKAJ SHARMA¹, AMIT KALE², RAJ PAWAR³, ARCHIT GUPTA⁴



ABSTRACT

Brucella fever also called as Bangs disease or Malta fever is a relatively uncommon Zoonotic illness which is on the rise in many parts of India. The disease often presents in humans with constitutional symptoms such as fever, malaise, weight loss or generalised body weakness, but is not limited to this in all cases. The present case report involves a 47-year-old female who presented to the Orthopaedic Outpatient Department of a tertiary care centre with complaints of fever and low backache and was diagnosed as a case of Brucellar Spondylodiscitis after careful history taking revealing an exposure to cattle in her household. Brucellosis should also be considered as a differential diagnosis to Tuberculosis (TB) and thoroughly investigated through a detailed medical history and radiological imaging. Effective management can be achieved with a multidisciplinary team, including orthopaedic surgeons, infection specialists, radiologists and microbiologists, as was done in the present case to ensure a favourable outcome.

Keywords: Abscess, Antibiotic therapy, Infection, Spine, Zoonotic disease

CASE REPORT

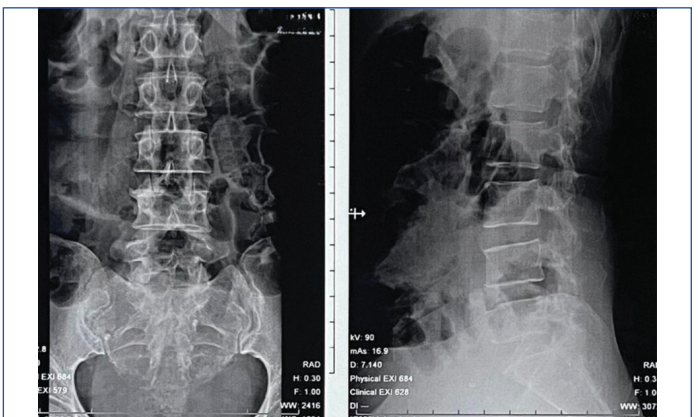
Patient was a 47-year-old female who presented to the orthopaedics Outpatient Department of a tertiary care centre with the complaints of pain in lower back which was radiating to bilateral lower limbs, evening rise of temperature, malaise and generalised weakness since two months. There was no history of fall or trauma nor did the patient have any co-morbidities. Upon inspection there was no obvious sign of deformity or swelling along the site of pain, on palpation it was found that there was a local rise of temperature along the Lumbosacral (LS) region and there was no restriction upon Lumbar flexion but was painful. Straight leg raising test was performed which was 40° on left-side and 60° on right-side and Lasegue's test [1] was negative for both lower limbs. The power was assessed as shown in [Table/Fig-1] below which showed a reduction in power of left lower limb compared to right. Reflexes were intact and there was no history of bowel or bladder involvement.

Muscle movement	Left	Right
Hip		
Flexion	3/5	4/5
Extension	3/5	4/5
Abduction	3/5	4/5
Adduction	3/5	4/5
External rotation at 90° flexion	3/5	4/5
Internal rotation at 90° flexion	3/5	4/5
External rotation in extension	4/5	4/5
Internal rotation in extension	4/5	4/5
Knee	3/5	5/5
Flexion		
Ankle		
Dorsiflexion	4/5	5/5
Plantarflexion	4/5	5/5
EHL	5/5	5/5
FHL	5/5	5/5

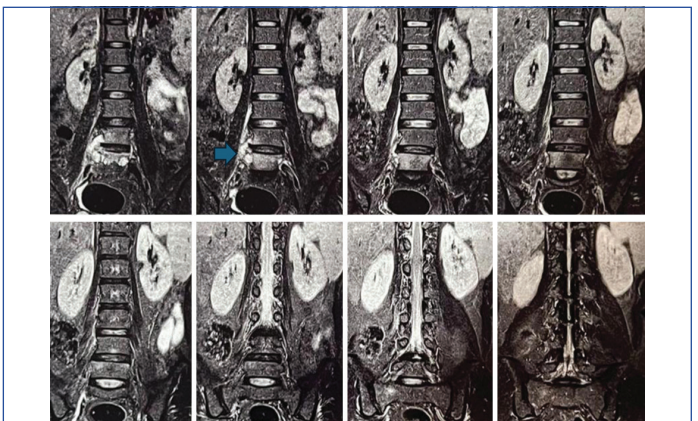
[Table/Fig-1]: Power upon admission of the patient according to MRC scale for muscle strength.

MRC: Medical research council; EHL: Extensor hallucis longus; FHL: Flexor hallucis longus; EHL and FHL were assessed by extension and flexion of the great toe; respectively against resistance

Laboratory investigations were carried out where the Total Leucocyte Count (TLC) count was 9,200 cells/ μ L, Erythrocyte Sedimentation Rate (ESR)-73 mm/hr and C-reactive Protein (CRP) -47 mg/L upon admission. An X-ray and Magnetic Resonance Imaging (MRI) of lumbo-sacral spine was carried out to identify the probable cause for the lower back pain which revealed the following picture below, [Table/Fig-2] shows the X-ray, [Table/Fig-3] shows the coronal view [Table/Fig-4] shows the Sagittal (T1) view, [Table/Fig-5] shows the Sagittal (T2) and [Table/Fig-6] shows the axial view. The MRI revealed

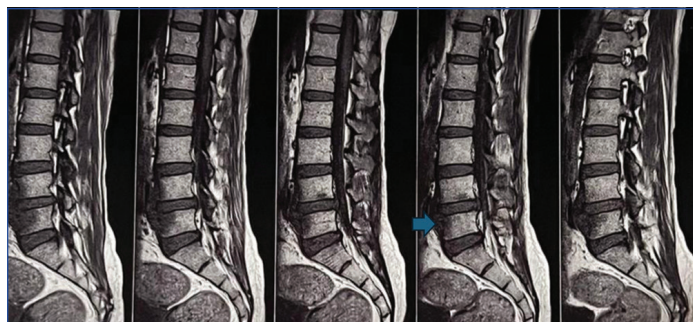


[Table/Fig-2]: X-ray LS spine (Antero-posterior view on left and lateral view on right).

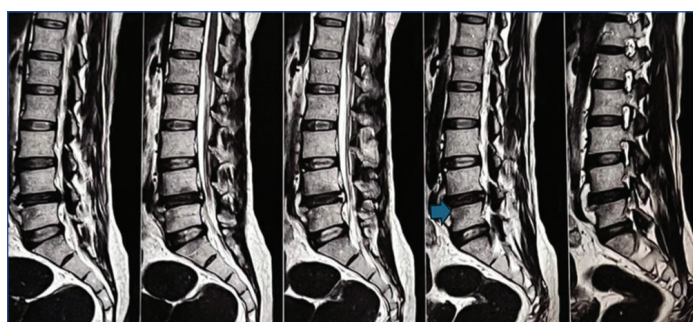


[Table/Fig-3]: Coronal cuts of MRI LS spine. Arrow depicting the para-vertebral abscess collection along the L4-L5 level.

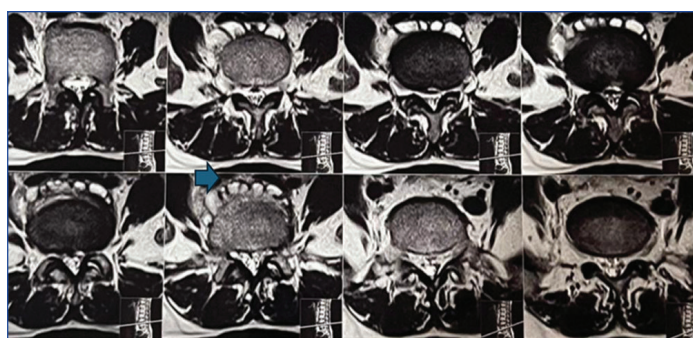
a picture suggestive of Potts spine of L4-L5 level where it showed multiloculated altered signal collection measuring about 8×60×38 mm Anteroposterior×Transverse×Craniocaudal (AP×TR×CC) which is suggestive of infective Spondylodiscitis and subligamentous collection in prevertebral and bilateral paravertebral region at L4-L5 level. The collection is depicted via arrows in the respective MRI figures below [2-5]. The sagittal view was suggestive of a characteristic radiological finding, which showed a Pedro Pons sign (parrots beak appearance) involving the anterior superior end plate of L5 vertebrae in this case.



[Table/Fig-4]: Sagittal (T1) cuts of MRI LS spine. Arrow points towards the Pedro Pons sign at the anterior superior endplate of L5 vertebral body.



[Table/Fig-5]: Sagittal (T2) cuts of MRI LS spine.



[Table/Fig-6]: Axial view of MRI LS spine. Arrow points towards a multiloculated appearance of the abscess collection at the pre vertebral junction which appeared distinct from the tuberculous abscess collection.

This was investigated further where a Computed Tomography (CT)-guided biopsy was carried out from the site of abscess collection, from which approximately 10 cc of pus was recovered, which was yellowish in colour, thick consistency and non foul smelling. This was sent for Cartridge-based Nucleic Acid Amplification Test (CBNAAT) investigation along with culture/sensitivity. However, this turned out to be negative for CBNAAT and revealed no growth in the culture sent. This prompted a consultation with the infectious disease specialist at the centre, where they suggested to carry out an additional investigation by sending Serum Agglutination Test (SAT) for *Brucella* which was outsourced as it was not available in this tertiary care centre. This test turned out to be positive three days after sending the sample where a titre of more than 1:320 is considered positive and in this case, the titre was 1:2560 [2]. This pointed the diagnosis of the case considered towards *Brucella abortus* causing Spondylodiscitis. The patient was then started on treatment sensitive to *Brucella* after considering the Liver

Function Test (LFT) {Total Bilirubin-0.42 mg/dL, Serum Glutamic Oxaloacetic Transaminase (SGOT)-86 U/L, Serum Glutamic Pyruvic Transaminase (SGPT)-134 U/L and Alkaline Phosphatase-411} and Renal Function Test (RFT) (Urea-18 mg/dL and Creatinine-0.57 mg/dL) values, Injection Streptomycin 1 g Intravenous daily OD for a duration of 15 days and Tab. Doxycycline 100 mg BD for six weeks. Tab Rifampicin 600 mg was also considered but was not administered due to the deranged LFT values of the patient. Upon follow-up it was seen that there was marked reduction in ESR and CRP levels to 50 and 15, respectively compared to the initial levels, along with reduced episodes of fever, low back pain and improvement in power of bilateral lower limbs.

DISCUSSION

A complete medical history is the key in understanding the true cause of psoas abscess or infective spondylitis especially in India which accounts for the majority cases of Tuberculosis (TB) throughout the world [3]. While initially it prompted an investigation solely for TB, and upon conducting these tests, it came out to be negative for TB. Which was later diagnosed as a case of Brucellosis causing the symptoms in the present study, albeit rare, the patient was then started on medical management (Involving use of Inj. Streptomycin and Tab. Doxycycline) specific for *Brucella* after carrying out relevant blood work to prevent systemic deterioration [4], which was avoided as Tab. Rifampicin was not administered due to deranged LFT values of the patient. In order to consider aetiologies other than *Mycobacterium* as a causative agent of infective spondylodiscitis or Psoas abscess factors such as a history of close proximity to animals or cattle needs consideration especially to diagnose *Brucella*.

Brucellosis is a zoonotic infection caused by bacteria of the *Brucella* genus. While humans are infrequent hosts, it continues to be a major global public health concern and ranks among the most widespread zoonotic diseases [5,6]. A total of 12 species are known to date, and each has its preferred animal host, although it can also infect other hosts. The primary *Brucella* species responsible for causing disease in humans include *B. melitensis* (from sheep and goats), *B. abortus* (from cattle), *B. suis* (from pigs), and *B. canis* (from dogs). Among these, *B. melitensis* and *B. abortus* are the most widespread globally [7]. In a systematic review conducted by [8] about one third of Brucellosis cases manifest as spondylitis or sacroiliitis where about 60-70% of the cases affecting the vertebrae involve the Lumbar spine [9]. The most common symptoms that develop in a case of Brucellosis are fever, chills, malaise and fatigue in addition to this the patient also gave a history of weight loss, evening rise of temperature and close proximity to cattle (cows). The aetiology due to TB cannot be ruled out due to the similarity in presentation of symptoms with regards to the present case. Differentiating Spondylodiscitis caused by *Brucella* or TB becomes challenging on imaging studies such as MRI but, in a study by they demonstrated that the most common location for brucellar infection involvement is the lumbar spine (L4 vertebrae) in contrast to TB affecting the thoraco-lumbar region commonly [10], the presence of para vertebral abscess is a common finding in brucella (65.38%) compared to TB (22.2%) spondylodiscitis and the incidence of severe vertebral body destruction, vertebral hyperplasia, posterior vertebral body convex deformity are uncommon findings in brucellar spondylodiscitis compared to TB.

The gold standard to diagnose a case of brucellosis is via bone marrow culture, but the invasiveness of the procedure must be taken into account [11]. However, the SAT remains the most commonly used diagnostic method as seen in similar studies conducted by [12,13] mainly, due to it being cost effective and user friendly especially in endemic areas [2]. The cut off value taken for SAT is 1:320 (in endemic regions) [14], in this case the titre was 1:2560. Along with this an X-ray of Lumbo-Sacral was done and an MRI. The X-ray did not reveal any significant changes, which

usually only shows changes after about 3-5 weeks post onset of the disease. The MRI however revealed the infection affecting both L4 and L5 vertebrae extending into the intervertebral disc which is classified as a diffuse form of Brucellosis [15] as seen in this case. The characteristic radiological finding (best visualised on MRI) of Brucellar spondylodiscitis although discrete, is the presence of Pedro Pons sign which involves the anterior superior end plate of the affected vertebrae [16], in this case it involved the L5 vertebrae but in a case by [17] it involved the T9 vertebral body. After diagnosing a case of Brucellosis the management consists mainly between conservative or surgical management. Conservative management consists of administration of tetracyclines, rifampicin, aminoglycosides, trimethoprim-sulfamethoxazole and quinolones. The standard regime for treatment consists of a combination of doxycycline (100 mg OD) for six weeks and an aminoglycoside (streptomycin 1 g i.v. daily for 2-3 weeks or gentamycin for 10 days) or rifampicin (600 mg BD) and doxycycline (100 mg OD) [18], in the present study centre however, after consultation with the infection specialist the plan was to start the patient on doxycycline (100 mg OD) for six weeks, streptomycin 1 g i.v. daily for two weeks and Rifampicin (600 mg BD). This was however not possible due to the deranged LFT values of the patient during admission and was instead kept on a combination of only Streptomycin and Doxycycline. Upon starting the aforementioned regimen there was a clinical improvement in symptoms by 21 days which is similar to a study by [12] where they used a combination of Streptomycin, Rifampicin and Doxycycline.

A limitation of the present case report was the delayed recognition of the patient's exposure to cattle which only came to light after further questioning during history taking. While this delay did not affect the patient's length of stay, it could have been avoided with more direct inquiry about cattle exposure. Furthermore, although surgical intervention was not necessary in this case, it is important for surgeons to remain vigilant about the potential need for decompression due to abscess formation associated with adjacent discitis.

CONCLUSION(S)

The most common cause of infective spondylodiscitis with an associated psoas abscess is Mycobacterium TB, especially in countries like India, which has the highest incidence of TB. However, brucellosis should also be considered as a differential diagnosis

and thoroughly investigated through a detailed medical history and radiological imaging. Effective management can be achieved with a multidisciplinary team, including orthopaedic surgeons, infection specialists, radiologists, and microbiologists, as was done in the present case to ensure a favourable outcome.

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