Journal of the Postgraduate Institute of Medicine 2025; 12(2): E272 1-6
https://doi.org/10.4038/jpgim.8473

Case Report

TB or *Listeria*? A dilemma in a patient with thoracic spondylodiscitis: A case report

Brabaharan Subhani[1,2], Sivapalan Maathury[2], Upul Dissanayake[2]

[1]Postgraduate Institute of Medicine, University of Colombo, [2]National Hospital, Sri Lanka

Key words: **spondylodiscitis, tuberculosis, listeria**

Corresponding Author: Brabaharan Subhani, E-mail< brabaharan197subhani@gmail.com >

https://orcid.org/0000-0003-4865-3791

Received: 30 Dec 2023, Accepted revised version: 06 Mar 2025, Published 02 Sep 2025

Competing Interests: Author has declared that no competing interests exist

Introduction

Spondylodiscitis or inflammation of the vertebral disc arises from an organism seeding in the vertebral endplate. Spondylodiscitis can be complicated by direct seeding in different compartments, resulting in paravertebral, epidural or psoas abscesses. The annual incidence of spondylodiscitis is 2.4 per 100,000 persons but increases with age [1]. It usually presents with back pain with systemic symptoms, fever or evidence of focal neurology in a patient with risk factors such as diabetes mellitus (DM) immunosuppression, malignancy, trauma or spinal procedures [1]. Common microbial aetiology includes *Staphylococcus aureus*, *Brucella* and tuberculosis (TB). *Listeria monocytogenes* is a foodborne pathogen that causes human listeriosis, is lethal in immunocompromised patients and is a rare cause of spondylodiscitis. Hence, it is imperative to consider unconventional diagnoses in immunocompromised patients while ensuring that typical organisms of regional interest are being treated or actively sought.

Case presentation

A 58-year-old female patient presented to us with back pain of two weeks duration and was admitted to the National Hospital of Sri Lanka, Colombo. The pain was a continuous aching over the thoracic region, radiating bilaterally and aggravated with movements. She was admitted due to reduced mobility secondary to pain and was unable to function independently. There was no evidence of neurological deficits, urinary retention, faecal incontinence or constitutional symptoms. She had a history of DM with both micro and macrovascular complications, hypertension, dyslipidaemia (DL), autoimmune hepatitis (AH), iatrogenic Cushing syndrome due to long-term use of steroids and long-term analgesic abuse. She was on premix insulin, atorvastatin, prednisolone, metformin and

gliclazide. She did not have a history of substance abuse, including the use of alcohol or smoking. She had recent travel to France and India but gave no history of exposure to animals or consumption of processed meats, cheeses or other dairy products.

On presentation, she was afebrile. She had round facies, acne and broad striae suggestive of iatrogenic Cushing's syndrome. Her cardiovascular, respiratory, abdomen and neurology examination revealed no abnormalities. There was severe tenderness over the mid-thoracic region with difficulty in mobilising due to pain. She subsequently developed fever spikes whilst in hospital. A summary of investigations is given in Table 1.

Table1: Summary of investigations

Investigation	Value
White blood cells	16.40-10.59 x 10^3/µL, (4.5-11.0)
Neutrophils	12.02 x 10^3/µL, (2.5-7.0)
Lymphocytes	3.34 x 10^3/µL (1.0-4.8)
Haemoglobin	14.8g/dL, (14-18)
Platelets	113 x 10^3/µL (150-450)
Serum creatinine	0.87mg/dL, (0.7-1.3)
Serum sodium	138mmol/L, (135-145)
Serum potassium	4.7mmol/L (3.5-5.2)
Calcium	8.3mg/dL (8.5-10.8)
Alanine transferase	38U/L (5-38)
Aspartate transferase	19U/L (8-33)
Alkaline phosphatase	245IU/L (44-147)
Gamma glutamine transferase	368U/L (5-40)
Albumin	2.7g/dL (3.5-5.5)
Globulin	4.0g/dL (2-3.5)
Total bilirubin	0.9mg/dL (0.2 – 1.2)
Thyroid stimulating hormone	0.268mIU/L (0.4-4.0)
T4	1.2µg/dL (4.5-11.5)
C reactive protein	38 – 144 – 83 – 13 -7mg/dL (<0.3)
Creatine phosphokinase	53µg/L (10-120)
Erythrocyte sedimentation rate (ESR)	55mm/hr (<15)
Urine full report	normal
INR	1.3 (<1.1)
2DEcho	normal
Hepatitis B/C/HIV	negative.

Radiographs of the thoracic spine showed multi-level degenerative disc disease without evidence of a fracture. Contrast-enhanced computed tomography (CECT) thorax, abdomen and pelvis were normal except for mild signal changes over the fifth and sixth thoracic vertebrae. Magnetic resonance imaging (MRI) of the spine showed signal changes in the fifth and sixth thoracic vertebral bodies and the adjacent disc with enhancing soft tissue components, suggesting spondylodiscitis with soft tissue extending bilaterally into the neural foramina (Figure 1).

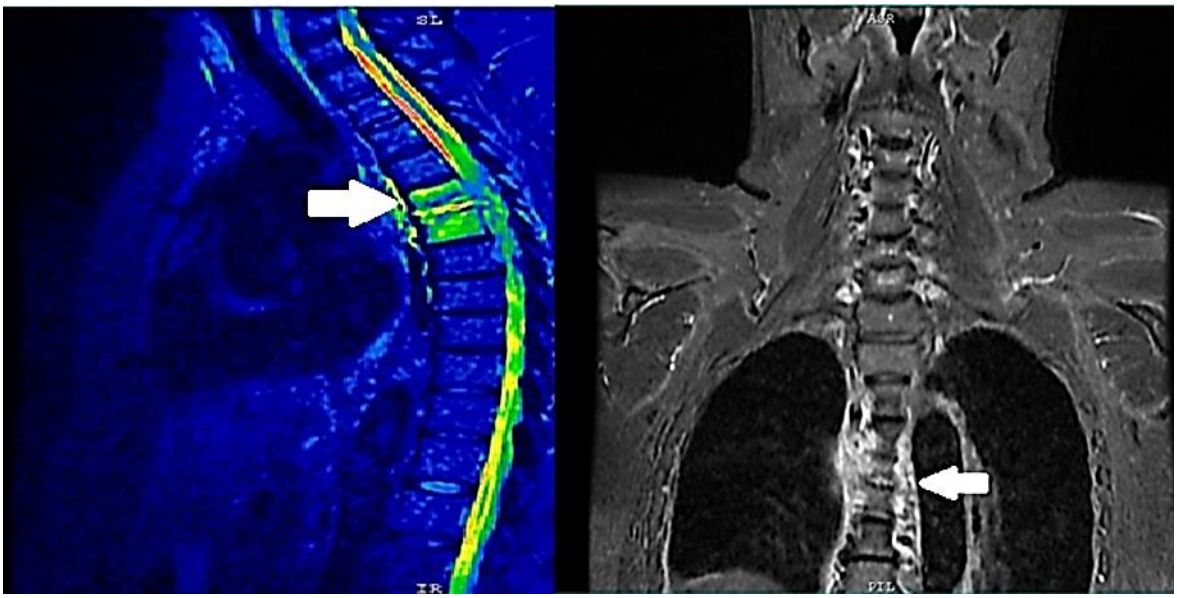

Figure 1: MRI image of the thoracic spine signal changes in the T5 and T6 vertebral bodies and the adjacent disc with enhancing soft tissue components suggesting spondylodiscitis. The solid arrows indicate the affected vertebral bodies and the adjacent discs

She was initially commenced on intravenous (IV) ceftriaxone and was subsequently converted to IV meropenem as *L. monocytogenes* was isolated in two blood cultures with antibiotic sensitivity to meropenem. A CT-guided biopsy of the fifth and sixth vertebral bone with a part of the adjacent disc was carried out seven days after the commencement of IV meropenem.

The biopsy revealed granulomatous inflammation with lymphocytes and plasma cells, with a vague granuloma with negative Gram stain. Ziel-Nielson stain was negative for acid-fast bacilli (AFB) in the biopsy specimen. Pyogenic culture and antibiotic sensitivity test (ABST), TB polymerase chain reaction (PCR) and TB culture of the biopsy were all negative. We assessed cerebrospinal fluid (CSF) studies to look for probability of central nervous system involvement due to both TB and listeriosis in this patient, which revealed a cyto-protein dissociation with evidence of protein – 105mg/dL, neutrophils – nil, lymphocytes – nil, red cells – nil, normal opening pressure, CSF for TB PCR and culture and pyogenic culture negative, CSF chloride – 109mmol/L and serum chloride – 105mmol/L. This was carried out after 12 days of IV antibiotics.

Due to the predisposition of TB to affect the thoracic spine, the underlying immunosuppression and the endemic nature of TB in Sri Lanka, anti-tuberculous treatment (ATT) was initiated after the imaging and biopsy findings were noted after liaising with the pulmonology team. The pain improved within two weeks of antibiotics, and two days into the commencement of the ATT, we faced the dilemma of whether to continue ATT or not. The patient stated significant improvement in the back pain and was satisfied with the response despite the prolonged treatment she had to endure.

Discussion

This case illustrates our diagnostic and therapeutic dilemma in treating this patient. This was amidst reports of sporadic central nervous system listeriosis cases among travellers to Adam's Peak. Our patient had evidence of bacteraemia as two blood cultures were positive for *L. monocytogenes*. However, culture from a vertebral specimen was negative on pyogenic culture and there was no evidence of micro-abscess formation with neutrophilic infiltration with a positive Gram stain which is typically seen in cases of listeriosis.

Listeria is a rare cause of spondylodiscitis; less than ten case reports were found in our literature search. It mainly affects immunocompromised patients or those with risk factors, as in our patient, and is rare in patients without risk factors. It is primarily identified in patients who have prosthetic joints and rarely in heart valve implants [3,4]. The diagnosis usually requires imaging, histological assessment and microbiological assessment.

Tuberculosis is hyperendemic in our country and has a typical thoracic predilection [5]. Our patient had typical MRI findings with thoracic vertebral involvement which led to the biopsy to diagnose or exclude the possibility of TB in this patient.

Tuberculosis is favored with findings of loss of vertebral body cortical definition and calcified paraspinal mass with thick irregular rim enhancement. Tubercular spondylitis appears hyperintense on T2-weighted images and hypointense on T1-weighted images with contrast enhancement indicating marrow oedema in the infected area. An important imaging feature that characterizes tuberculous infection compared to bacterial infection is sparing of the intervertebral disc in the early stage of infection. Early spread to discs with loss of disc height and disc herniation favor bacterial infection. Involvement of the anterior vertebral body corner, subligamentous spread, multiple vertebral bodies, extensive paraspinal abscess formation, abscess calcification and vertebral destruction differentiates tubercular from bacterial spondylodiscitis [5]. Listeria spondylodiscitis shows high signal intensity within the disc space involving the end plate with end plate irregularity comparable with bacterial spondylodiscitis. There may be enhancing paravertebral soft tissue [4]. The histology revealed histological findings of granulomatous inflammation with lymphocytes and plasma cells, with a vague granuloma formation which is suggestive of TB. Hence, considering all the above factors we decided to commence her on ATT. However, the TB PCR and TB culture taken from the vertebral biopsy were subsequently negative. Clinical improvement was noted within 2 days of commencement of ATT; which led to the dilemma of whether to continue ATT. Lymphocytic infiltration or granuloma formation has never been reported with listeriosis. Hence, we liaised with the pulmonology, microbiology and orthopaedic teams and decided to continue ATT whilst continuing the IV antibiotics.
In a similar case with *Listeria* spondylodiscitis, a 79-year-old presented with persistent low back pain with negative blood cultures. An MRI showed L3-L4 discitis. Fluid aspirate from the paravertebral abscess showed evidence of *Listeria* and he was treated with a 6-week course of IV antibiotics with complete resolution of symptoms [6]. In another report, A 92-year-old presented with low back pain with blood culture positive for

L. monocytogenes. MRI of the lumbar spine revealed a multifocal spondylodiscitis with global and focal hyperintensity of the disc in T2 and abnormal hypointensity. He was treated with IV antibiotics for one week and discharged on oral cotrimozaxole [7] and there was gradual improvement within 3 months of treatment. Similarly, a 55-year old presented with back pain with negative blood cultures. MRI revealed spondylodiscitis at L4-L5 level with an epidural abscess causing dural sac compression, contrast enhancement of L3, L4 and L5 vertebral bodies, and abscesses in the paraspinal muscles with the aspirate culture positive for *L. monocytogenes*. He was treated with IV meropenem for 6 weeks and the pain resolved within 6 months. [8] A 75-year-old presented with low back pain after a valve replacement. MRI showed evidence of spondylodiscitis. Blood and tissue culture revealed *L. monocytogenes.* Following 6 weeks IV antibiotics, the patient recovered completely [9]. In all the above cases there was significant delay in diagnosis and appropriate treatment led to recovery.

The key takeaway message from this case report, is to consider the unconventional diagnosis in immunocompromised patients while ensuring that typical organisms of regional interest are being treated.

Conclusion

Listeriosis associated with thoracic spondylodiscitis is an uncommon presentation. Appropriate imaging, imaging-guided biopsy, and microbiological investigations will aid in arriving at a microbial diagnosis in a patient with spondylodiscitis. In an immunosuppressed patient, invasive listeriosis and TB can be fatal; thus, we are often called upon to err on the side of caution when attempting to treat these patients.

Consent for publication**:** Informed written consent was obtained from the patient to publish details of the illness and publication of investigation and imaging findings.

Acknowledgements**:** We thank our ward staff for their tireless effort in managing our patients.

References

1. Zimmerli W. Clinical practice. Vertebral osteomyelitis. The New England journal of medicine 2010; 362(11): 1022-9. https://doi.org/10.1056/NEJMcp0910753
2. Chenoweth CE, Michigan M. Vertebral osteomyelitis, discitis, and spinal epidural abscess in adults. Ann Arbor (MI): Michigan Medicine University of Michigan; 2018.
3. Charlier C, Leclercq A, Cazenave B, et al. Listeria monocytogenes-Associated Joint and Bone Infections: A Study of 43 Consecutive Cases. Clinical Infectious Diseases 2011; 54(2): 240-8. https://doi.org/10.1093/cid/cir803
4. Randrianarisoa RMF, Ramanandafy H, Mania A, et al. Listeria endocarditis and spondylodiscitis: A case report and review of the literature. Clinical case reports 2022; 10(5): e05899. https://doi.org/10.1002/ccr3.5899
5. Colmenero JD, Jiménez-Mejías ME, Sánchez-Lora FJ, et al. Pyogenic, tuberculous, and brucellar vertebral osteomyelitis: a descriptive and comparative study of 219

cases. Annals of the Rheumatic Diseases 1997; 56(12): 709. https://doi.org/10.1136/ard.56.12.709

6. Ohaly RA, Ranganath N, Saffie MG, Shroff A. Listeria spondylodiscitis: an uncommon etiology of a common condition; a case report. BMC Infectious Diseases 2020 Jul 31;20(1). https://doi.org/10.1186/s12879-020-05286-y
7. Aubin GG, Boutoille D, Bourcier R, Caillon J, Lepelletier D, Bémer P, Corvec S. Unusual case of spondylodiscitis due to Listeria monocytogenes. Journal of Bone and Joint Infection. 2016 Feb 29;1(1):7-9. https://doi.org/10.7150/jbji.13863
8. Vetkas A, Mitt P, Tikk R. Spontaneous spondylodiscitis and epidural abscess due to Listeria monocytogenes in a middle-aged patient with gentamicin related side effects: A case report and a review of literature. Brain and Spine. 2022 Jan 1;2:101696. https://doi.org/10.1016/j.bas.2022.101696
9. Randrianarisoa RMF, Ramanandafy H, Mania A, Benelhadj AD, Clément M, Sabbagh L, et al. Listeria endocarditis and spondylodiscitis: A case report and review of the literature. Clinical Case Reports. 2022 May 1;10(5). Available from: https://doi.org/10.1002/ccr3.5899