

Case Report

Multilevel spinal tuberculosis: a case report emphasizing the critical role of early diagnosis in mitigating neurological complications

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Received: 27 February 2025

Revised: 08 April 2025

Accepted: 16 April 2025

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ABSTRACT

Tuberculosis (TB) of the spine is a common site of osseous TB, accounting for 50%–60% of cases 1. Spinal TB still occurs in both developed and developing countries. The diagnosis of spinal TB is difficult, and it commonly presents at an advanced stage. Delays in establishing diagnosis and management result in complications such as spinal cord compression and spinal deformity 2. We report a case of tuberculosis of the spine in a 23-year-old female patient who presented with complaints of lower back pain for 2 months and difficulty in standing and walking for 1 month. Pain had an insidious onset and gradually progressed over a period of 2 months. The patient gave a history of weakness of both lower limbs for 1 month. Plain X-ray The dorso-lumbar spine showed vertebral segmental bone destruction at the D11 vertebra. MRI of the dorsal spine showed wedging and collapse noted at the D11 vertebral body, forming a gibbus deformity causing thecal and cord compression. So, surgery was performed with debridement of debris and posterior stabilization and fixation at the D8, D9, and L1-L2 vertebrae, and also psoas abscess drainage was done on a later date. The patient was started on anti-tubercular therapy after confirming the diagnosis, and the patient recovered well and is currently under follow-up. For patients with spinal TB, debridement and autograft bone fusion with posterior fixation appear to be effective in arresting disease, correcting kyphotic deformity, and maintaining correction until solid spinal fusion.

Keywords: TB spine, Multilevel disease, Early diagnosis, Neurological deficit, Anti-tubercular therapy

INTRODUCTION

Spinal tuberculosis (TB) is the common form of osseous TB, accounting for 50%–60% of cases. The first record describing in detail spinal deformity and paraplegia resulting from spinal TB was given by Percival Pott in 1779.¹ The outcomes for patients with spinal tuberculosis have significantly improved due to early intervention and modern therapies.

Researchers from around the world have thoroughly studied spinal tuberculosis, and the findings are well documented. Although the occurrence of the disease is rare in the current day and age, the incidence is still a significant number. It presents as a challenge to deal with

in both developed and developing nations. Spinal tuberculosis is challenging to diagnose and frequently manifests at an advanced stage despite our understanding of the disease process and the recent advancements in its diagnosis and management.²

Complications like spinal cord compression and spinal deformity are more common when diagnosis and treatment are delayed. Patients typically exhibit pain, palpable masses, lower limb weakness, Gibbus deformity, and kyphotic deformity in chronic cases. Therefore, early diagnosis and timely treatment are essential for effectively managing the disease and preventing further complications. This has been elaborated on in our case report.

CASE REPORT

A 23-year-old female presented with complaints of lower backache radiating to both lower limbs and pain in the hip for 2 months and difficulty in standing and walking for 1 month. Pain was insidious in onset and gradually progressive in nature. She had complained of an inability to extend the hip and knee for 15 days at the time of presentation.

She had a history of similar complaints 1 year ago, when a biopsy revealed she had tuberculosis, for which she was started on ATT. The patient took treatment for 6 months and later discontinued it and was symptom-free for 4 months.

Following the symptom-free period, she developed the above-mentioned symptoms. The patient gave a history of unexplained weight loss in the last 2 months with no history of trauma. There was no family history of tuberculosis.

On examination, the patient walks with walker support and has an attitude of both hips and knees in flexion, and on inspection, the skin appeared normal and no angular deformity was noted.

On palpation, tenderness was present from the D8 to L2 spinous process, and paraspinal muscle spasm was present. Gibbus was noted at the D11 vertebra. Weakness was noted over left lower limb muscles from hip flexors to flexors of toes, and clonus was noted over the left lower limb. Fullness was noted over the right iliac fossa, and bilateral distal pulsations were well felt and equal.

Routine blood investigations were done, and C-reactive protein (CRP) was found to be positive with a value of 36 (normal <5), and the erythrocyte sedimentation rate was also high with a value of 80 mm/hr. Total counts and other parameters were within normal limits.

MRI of the dorsolumbar spine showed spondylodiscitis involving the D11 vertebral body, the inferior endplate of D10, and the superior endplate of the D12 vertebral bodies with associated marrow. Edema with moderate septate abscess in the prevertebral, bilateral paravertebral, and anterior epidural space-suggestive of Pott's spine.

Pre operative MRI and report

Surgery was planned, and with the consent of the patient, posterior spinal decompression, debridement, and abscess drainage were performed under general anesthesia, and infective material was removed. Shiny white purulent material was seen in the paravertebral space and was excised and sent for biopsy.

The cavity was filled with allograft, wound wash was given, and fixation was done with pedicle screws and

connecting rods. The wound closed in layers after placing the drain and later was removed.

The patient improved clinically for a week but again complained of abdominal pain, and again an abdominal USG was done, which showed further collection in the right psoas muscle plane, and it was again drained, and a drain was placed, which was removed after 12 days.

On further follow-up, the patient improved clinically, and her neurological deficits resolved. She was able to walk with walker support with a K-T brace for 3 weeks and was later mobilized without a walker. Currently, the patient is under follow-up regularly and is doing well.

Histopathological examination revealed viable and necrotic bony bits and soft tissue bits showing large areas of necrosis surrounded by multiple granulomas showing epithelioid cells, lymphocytes, and Langhans-type multinucleated cells.

ZN stain for AFB showed occasional acid-fast bacilli and necrotizing granulomatous inflammation suggestive of tuberculosis.

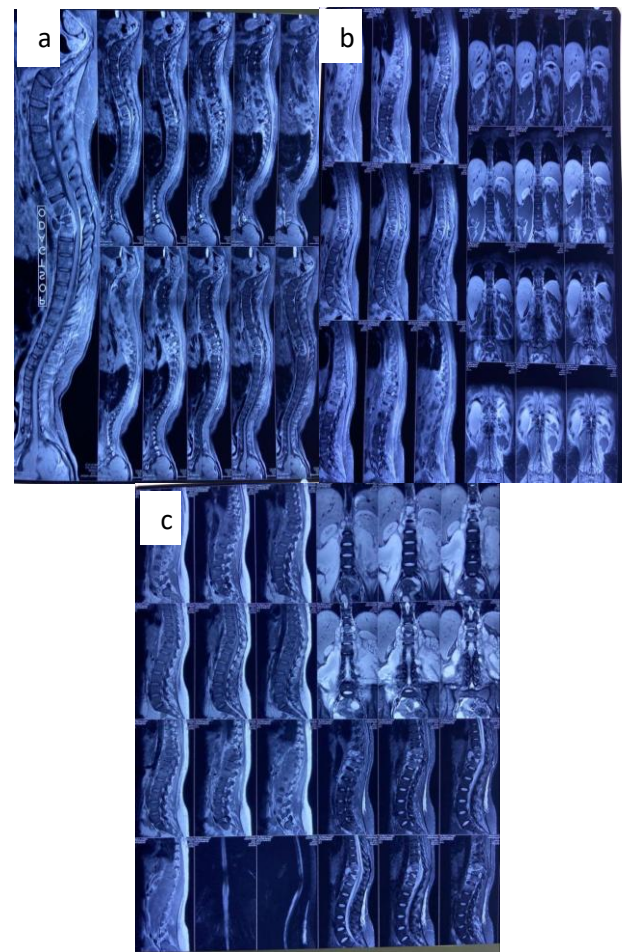


Figure 1 (a-c): T2W MRI, Sagittal and coronal sections, multiple level involvement, kyphosis and paraspinal abscess.

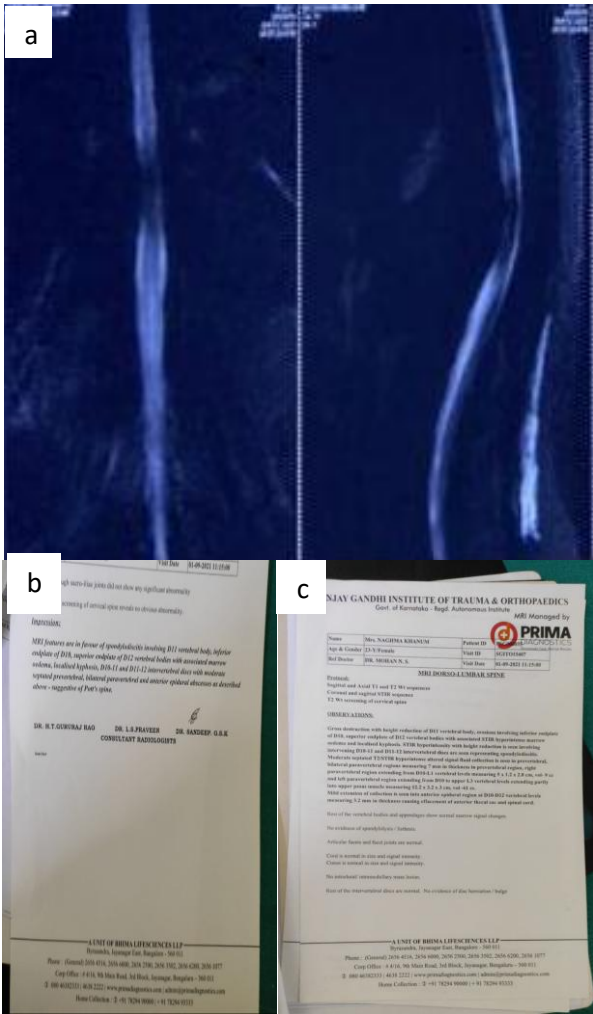


Figure 2: (a) Myelogram showing cord compression, (b and c) MRI report.



Figure 3: Post operative X-ray.

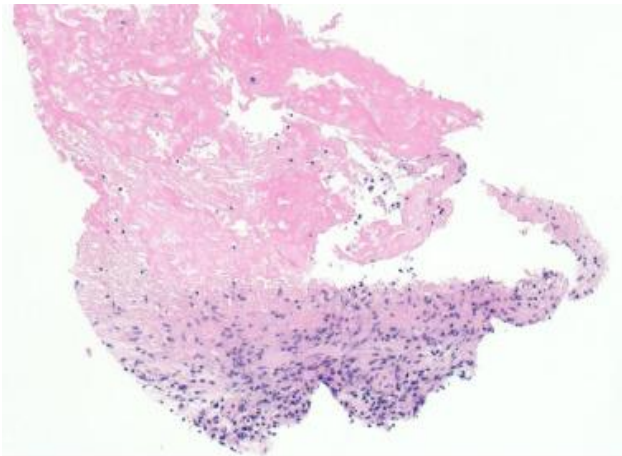


Figure 4: Microscopy-granulomatous inflammation.

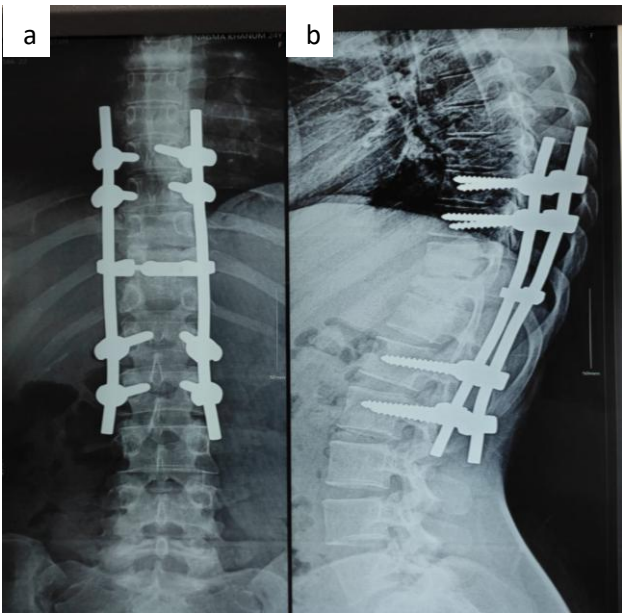


Figure 5 (a and b): 6 weeks follow up X-ray.

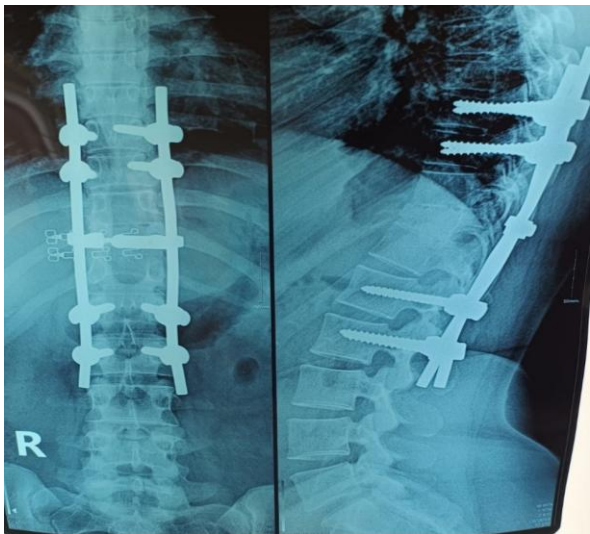


Figure 6: 6 Months follow up.

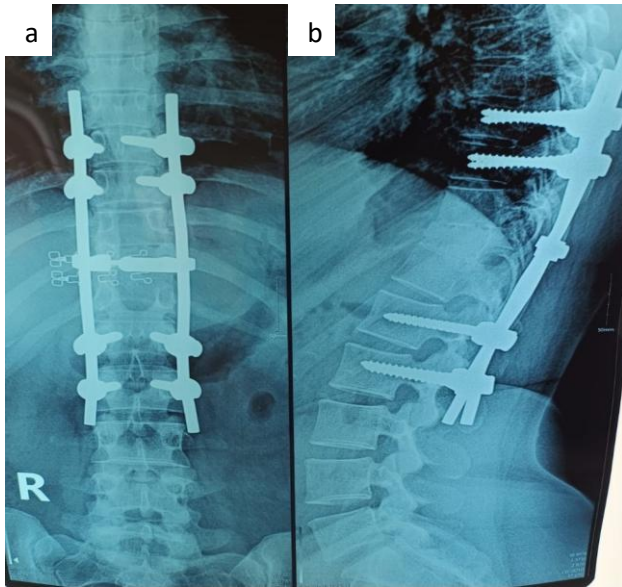


Figure 7 (a and b): 2 year 10 months follow up.

DISCUSSION

Spinal tuberculosis is the most common form of osteoarticular tuberculosis, and its incidence has been rising in recent years.¹⁻³ Early diagnosis and proper antituberculosis treatment are crucial for curing the disease and preventing complications.

The thoracolumbar segment of the vertebral column, between T10 and L2, acts as a link between the mobile lumbar segment and a relatively stiff thoracic segment, thereby influencing the spinal mobility and biomechanical stress due to the change in biomechanics from thoracic kyphosis to lumbar lordosis. These anatomical and functional traits make the thoracolumbar region more susceptible to stress and, as a result, to bacterial invasion, which can result in spinal tuberculosis. Furthermore, because there is a chance of pleural injury due to its close proximity to the pleural cavity, surgical intervention becomes more difficult.

Thoracolumbar tuberculosis, the most common site of spinal tuberculosis primarily affects the vertebral bodies and spreads under the ligamentous structures to form paraspinal abscesses. If left untreated, it can result in kyphotic deformities, nerve compression, and spinal instability. While standard antituberculosis treatment can cure most cases, atypical symptoms and a lack of awareness often lead to delays in diagnosis.^{2,8}

Surgery is usually considered in the situations like non-responders or those who develop resistance to antituberculosis medications, neurological deficits, in cases of spinal instability or severe kyphosis.

There are multiple surgical approaches for thoracolumbar tuberculosis; they include anterior, posterior, and combined anterior-posterior approaches, each with its own

benefits and drawbacks. The choice of approach is influenced by factors such as the location and severity of the disease, the surgeon's expertise, and imaging findings. As detailed in a study by Cui et al, comparing the outcomes of different surgical approaches, posterior fixation was found to be effective in correcting kyphosis and maintaining spinal stability. Though they concluded that all three options yielded good clinical results, they found that combining anterior and posterior approaches can lead to longer operative times, increased blood loss, more significant trauma, and a higher risk of perioperative complications.⁶

The indications for surgical intervention as described by Tuli et al, who introduced the "middle path regimen" in 1975, are of vital importance even to this date.⁷ Surgery is typically recommended when no significant, progressive neurological recovery despite 3–4 weeks of conservative treatment. Neurological deficit occurs or deterioration of preexisting deficit during the course of treatment.¹⁰ The patient develops a prevertebral cervical abscess, swallowing difficulties, or breathing issues. Advanced neurological symptoms, such as flaccid paralysis, severe muscle spasms, or bowel and bladder involvement, are present. Surgical management of tuberculosis of the spine, in current times, aims to remove infected tissue, relieve spinal cord pressure, correct deformities, and stabilize the spine.⁸⁻¹⁰

CONCLUSION

Spinal tuberculosis should always be considered when evaluating patients with spinal pathology because, left untreated or misdiagnosed, the disease can cause severe spinal deformities and irreversible neurological damage. Early and prompt diagnosis with timely treatment significantly improve outcomes, facilitating early recovery of functions and avoiding complications, thus underscoring the importance of early diagnosis.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Channappa TS, Jairam M, Yatish, Thumati PP. Multilevel spinal tuberculosis: a case report emphasizing the critical role of early diagnosis in mitigating neurological complications. *Int J Res Orthop* 2025;11:650-4.