



Case Report

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A Case Report of Spinal Tuberculosis with Multilevel Vertebral Fractures and Paraplegia



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ABSTRACT

Spinal tuberculosis (TB) is a rare extrapulmonary manifestation that can cause vertebral fractures, neurological deficits, and paraplegia. This report presents a 43-year-old male with sudden paraplegia, back pain, and sensory loss. MRI revealed fractures in T10, T11, and L5, and histopathology confirmed spinal TB with concurrent pulmonary TB and pleural effusion. The patient's history of chronic dexamethasone misuse contributed to immunosuppression and disease dissemination. Classified as Grade 4 paraplegia, his condition required surgical stabilization, anti-TB therapy, and supportive care. This case highlights the rarity of multilevel vertebral fractures and severe neurological deficits in spinal TB, emphasizing the importance of early imaging, tissue biopsy, and prompt multidisciplinary intervention to prevent permanent disability.

Introduction

Tuberculosis (TB) is one of the most widespread infectious diseases, commonly caused by *Mycobacterium tuberculosis*, and affects the lungs in its pulmonary form [1]. In about 20% of patients, TB may involve other organs or tissues, appearing as extrapulmonary TB (EPTB). The most common sites are the hip (20%), knee (10%), ankle and foot (5%), and shoulder (1%) [2]. One of the rare forms of EPTB is spinal tuberculosis (STB), also known as tuberculous spondylitis. STB can lead to significant structural damage to the spine, neurological deficits,

severe pain, and potential paraplegia [3]. The destruction may rarely spread to a few vertebral bodies, which can result in severe deformities and fractures [2]. Diagnosis generally requires imaging modalities, including MRI, and confirmation through microbiological cultures examination [4]. In this article, we report a patient with a nontraumatic vertebral column fracture secondary to TB.

Case Presentation

A 43-year-old male visited the emergency department of Imam Khomeini Hospital in Tehran, Iran, with the sudden onset of severe lower back pain, alongside

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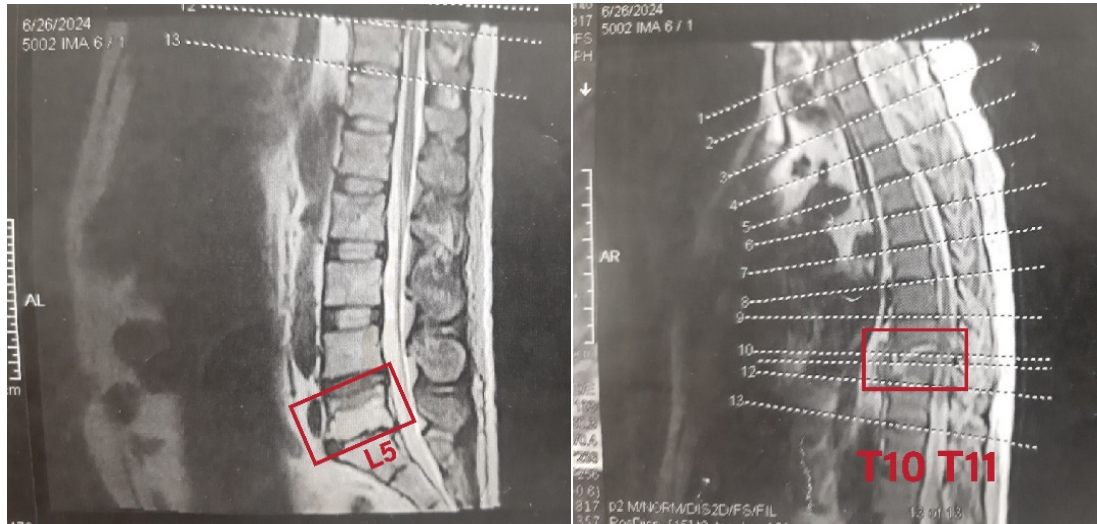


Fig. 1. (T10, T11 and L5 fracture: Spinal MRI revealed the destruction of T10, T11 and L5 vertebral bodies.)

paralysis and numbness in both legs. The patient reported light chronic lower back pain that began roughly a year ago. He also reported experiencing fever and chills over the past month. MRI imaging revealed fractures in the vertebrae at T10, T11, and L5, which prompted emergency surgery to stabilize these regions (Figure 1).

During the procedure, a bone biopsy of the vertebral tissue was taken, and histopathological examination revealed necrotizing granulomas, the presence of acid-fast bacilli (AFB) in Ziehl-Neelsen staining, and positive *Mycobacterium tuberculosis* polymerase chain reaction (MTB-PCR), confirming the diagnosis of disseminated spinal tuberculosis. After further investigations, a pleural effusion (PE) in addition to pulmonary TB was diagnosed. Pleural fluid analysis showed lymphocytic predominance, elevated adenosine deaminase (ADA) levels, and positive MTB-PCR, confirming tuberculous pleuritis. Pulmonary involvement was confirmed by sputum AFB smear positivity and MTB-PCR. He is currently hospitalized in the pulmonary unit due to pleural effusion (PE) that was identified followed by a video-assisted thoracoscopic surgery (VATS). A chest tube was inserted due to large loculated pleural effusion causing significant respiratory distress, which did not respond to initial medical therapy (first-line anti-TB drugs including isoniazid and rifampin). The procedure was performed to alleviate symptoms and prevent further complications. Follow-up imaging ruled out fistula formation. Therefore, the patient was started on a standard anti-tuberculosis regimen (pyrazinamide and ethambutol) according to WHO guidelines. The pleural effusion resolved significantly after initiating anti-TB therapy, with chest tube removal planned once the drainage subsided.

Post-surgery, the patient was fully conscious but complained of paresthesia, paralysis, and involuntary muscle spasms in both legs. Clinical examination demonstrated a complete loss of fine touch, pain, and temperature sensation in both legs, although he retained a vague sense of non-specific tactile feedback.

Discussion

In the course of this patient's condition, various unusual aspects became evident, which highlight the complexities of STB, emphasizing the importance of urgent diagnosis and management. First, the occurrence of vertebral fractures at multiple sites (T10, T11, and L5) due to TB is unusual [5]. Previous reports on TB-related vertebral fractures are sparse, and most cases in the literature describe a more gradual vertebral collapse. Also, TB generally affects a single location in its skeletal form rather than spreading to multiple vertebrae [6-8].

The neurological deficits observed in this patient present a complex challenge, impacting both motor and sensory pathways. The patient exhibits sustained paraplegia coupled with significant sensory loss, a pattern that is atypical in STB [9]. While neurological complications are common in STB, the degree of paralysis along with the preservation of vague tactile sensation is particularly rare [10]. This scenario suggests a nuanced interplay between local nerve damage due to the TB infection and the effects of corticosteroid treatment, which may alter the usual progression of neuropathy.

Table 1. Kumar's classification system for paraplegia due to STB

Grade of paraplegia	Complaints/Symptoms				
	weakness	walking	Motor	Sensory	Autonomic
1	Negligible or weakness appearing after exercise	Able to walk without support	Extensor planter± brisk ankle jerks Muscle power grade IV to V	-	-
2	Mild or Feels weakness	Able to walk with support	Motor weakness, brisk tendon jerks, ill sustained muscle clonus, muscle power grade III	Sensory dulling and paresthesia	-
3	Moderate or weakness is more marked	Not able to walk Confined to bed Can move limbs	Brisk tendon jerks, sustained muscle clonus, muscle power grade I to II	Hypoesthetic and anesthetic patches	May be present
4	Severe or complete loss of power and control	Not able to move limbs even in bed	a) Paraplegia in extension, power grade 0 b) Paraplegia in flexion, power grade 0, flaccid paralysis	Total loss	Complete loss of bladder and bowel control and incontinence

In addressing the management of such intricate cases, Kumar's classification system for paraplegia due to STB offers valuable guidance (Table 1). This system categorizes paraplegia into four grades, each indicating varying levels of motor weakness and function [11]. Patients identified as grade 1 or 2 are typically considered for conservative management, which includes extended multidrug antibiotic therapy aimed at reducing inflammation and alleviating pressure on affected neural structures. In contrast, for patients presenting with grades 3 or 4 (such as this patient), surgical intervention is often necessary, especially when imaging techniques such as MRI or CT scans reveal significant spinal cord compression [12]. These imaging modalities are crucial for determining the extent and severity of neural impingement, thus informing decisions about surgical decompression and stabilization, which are vital for optimizing patient outcomes.

Conclusion

In conclusion, spinal tuberculosis with vertebral fractures is an unusual and complex condition, where early imaging, especially MRI, is key to identifying the extent of spinal involvement and risks of nerve damage. Rapid diagnosis enables timely surgical and medical interventions, which can significantly reduce complications like paralysis. In this case, comprehensive intraoperative tissue sampling for TB and other pathogens was essential for targeted treatment. Such cases remind us of the importance of a vigilant approach, especially with persistent spinal pain, for improved outcomes and prevention of permanent disability.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors have no conflict of interest to declare.

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