



## Case Report

# Vertebral Instability Syndrome as the Initial Manifestation of Advanced Tuberculosis in an Immunocompetent Patient: A Case Report

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## Abstract

**Introduction:** The inability of the spine to perform movements in the absence of pain or neurological manifestations is related to the term instability. Currently, rigorous records of endemic infectious diseases are scarce in our region, as are data on vertebral neoplasms; therefore, the diagnostic approach is complex. In 2025, 11 patients with tuberculosis were evaluated at the University Hospital of the Andes - Merida, Venezuela. It is known that the main risk factors for developing this disease are related to malnutrition and immunodeficiency. Clinically, the diagnostic considerations for tuberculosis include the typical aspects of a bacterial infection, and when vertebral lesions are present, neoplastic space-occupying lesions are considered more frequent. Likewise, in rare cases where there are no risk factors for the development of any type of infection, the diagnosis often goes unnoticed. **Case presentation:** We present the case of a 44-year-old male patient, currently incarcerated, who presented with a four-month history of progressive back pain. He subsequently developed paresthesia, decreased sensation and motor function beginning in the T4 dermatome, impaired bowel and bladder control, and paraparesis with hyperreflexia. An imaging study performed five months after the onset of symptoms revealed an extensive retropleural space-occupying lesion extending from T3 to T12. Due to the established chronic neurological deficit, two possible approaches were considered: percutaneous biopsy versus thoracotomy. A right posterolateral thoracotomy between the 5th and 6th ribs was chosen, with the participation of thoracic surgery and neurosurgery teams. Excision of approximately 250 grams of a yellowish, granular, Caseo-type mass was achieved, and a biopsy of the granuloma was taken. A chest tube was left in place and there were no post-operative complications. **Results:** The caseous material analysis showed: absence of acid-fast bacilli or bacterial morphology, presence of -3 leukocytes/field, no fungal elements were observed on KOH, and the culture was negative at 48 hours. The granulomatous tissue biopsy showed: chronic “caseating” (necrotizing) inflammation consistent with tuberculous etiology. The postoperative course was satisfactory with a decrease in pain within 24 hours. Pharmacological treatment was initiated with rifampicin, isoniazid, and ethambutol, with excellent results; absence of pain, although dystonia persisted in the lower extremities with paraparesis. **Conclusions:** It can be concluded that the diagnostic approach to vertebral tuberculosis in immunocompetent patients is complex, as it is a rare entity; however, a high clinical suspicion with appropriate selection of diagnostic methods can be useful.

## Keywords

Tuberculosis, Immunocompetent, Instability, Diagnosis, Initial Manifestation

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## 1. Introduction

The inability of the spine to perform movements in the absence of pain or neurological manifestations is related to the term instability [1]. It is expected that a harmful agent will alter and promote biomechanics, as in processes of traumatic, neoplastic, degenerative, or infectious origin. Currently, rigorous records of endemic infectious diseases are lacking in our region, and records of vertebral neoplasms are also scarce. However, even in modern times, tuberculosis infection remains a significant public health problem. It has persisted as an infectious disease with high morbidity and mortality, despite the various advances made in prevention and treatment [1]. In 2025, 11 patients with tuberculosis were evaluated at the University Hospital of the Andes in Merida, Venezuela. While tuberculosis has various risk factors and a predilection for lung tissue, it can appear in any organ or system [2]. In cases of extrapulmonary involvement, the spine may be affected, occurring in 11% of cases in some studies, making it one of the most frequently involved skeletal sites. In these situations, the most common presentation is Pott's disease (PD) or tuberculous spondylodiscitis (60%), followed by arachnoiditis (20%), meningitis (12%), and intramedullary lesions (8%) [3]. Spinal epiphysis (SE) is a form of TB that affects two or more consecutive vertebrae, followed by infection of the adjacent intervertebral disc, as well as surrounding non-bony structures. It is rare; only 1% of all tuberculosis cases involve the spine in this form [2, 3]. In the presence of diagnosed pulmonary tuberculosis or when risk factors for its development are present, the suspicion of spinal involvement is higher. The problem arises when there is no clinical or laboratory data to guide the diagnosis, especially in immunocompetent patients. In these clinical situations, diagnostic delays are very common, sometimes lasting up to two years [3, 4]. Other more common spinal conditions, such as neoplastic lesions, are often considered in cases of vertebral instability. Advanced imaging studies, such as magnetic resonance imaging, when carefully evaluated, can be very useful tools in the early diagnosis of spinal tuberculosis, even before irreversible neurological alterations occur [4]. The spinal vascular conditions of an adult differ from those of a child; due to this consideration, the area of greatest involvement of a vertebral body is usually the anterior region, showing a greater tendency to appear in the thoracic region and is usually more frequent in young adults with the presence of some risk factors (malnutrition, immunodeficiency, overcrowding) [5]. It has been reported that the etiological diagnosis of vertebral tuberculosis must be demonstrated by isolating the causative agent, but this is not easy in many cases because the patient may present with a low bacterial load ("paucibacillary") of Koch's bacilli, given the low oxygen concentration in the vertebral cavity [6]. Furthermore, Calderon-Garciduenas AL et al. have stated that "a negative microbiological result in the appropriate clinical and/or

radiological context does not rule out TB infection due to the high false-negative rate of these tests" [7]. Antibiotic treatment alone is insufficient to treat the infectious condition, and some researchers suggest that surgery is required in 24% of cases. Although the surgical approach will depend on each individual case, it is proposed that the surgical technique or approach is aimed at draining the mass or abscess, decompressing the nerve structures, and, if possible, stabilizing the spine [8]. Several approaches have been proposed, including the percutaneous transforaminal approach, for the diagnosis and treatment of tuberculous spondylodiscitis. It is highlighted as a minimally invasive technique that allows for the diagnosis of tuberculous spondylodiscitis and provides symptomatic improvement for the patient [9]. On the other hand, the usefulness of posterolateral transpleural thoracotomy as an approach to the spine has been reported [10].

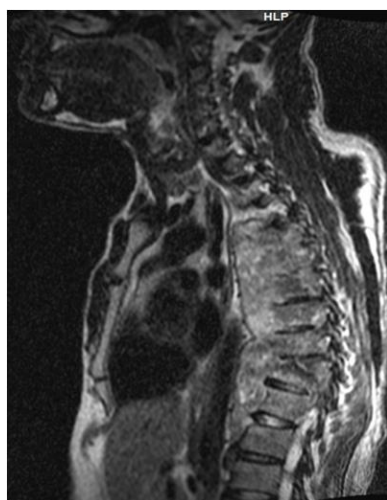
In cases of limited involvement of a vertebral body, diagnostic management can be performed by fluoroscopically guided percutaneous biopsy [11]. The surgical challenge arises when multiple spinal levels are involved. In this case, it is not only important to determine the origin of the lesion, but also to address any neurological deficits (sensory, motor, or autonomic) that a given patient may experience. The main objectives of our surgical intervention were to remove as much of the lesion as possible, obtain a representative sample for histological diagnosis, and relieve neural compression, choosing the posterolateral thoracic approach as the most appropriate. We achieved 80% excision of the spinal lesion, and a biopsy of granulomatous tissue revealed chronic caseous (necrotizing) inflammation consistent with a tuberculous etiology. This finding is crucial for guiding drug therapy.

The objective of this manuscript is to report an unusual primary clinical presentation of spinal tuberculosis in an immunocompetent host, with considerations of surgical approaches for diagnosis and adjuvant treatment.

## 2. Clinical Case

This is a 44-year-old male patient, currently incarcerated, with no significant family history or history of trauma. He presented with a one-year history of insidious chest pain with movement, which worsened over the following months. Four months prior to hospital admission, he experienced progressive muscle weakness in his lower extremities, sensory disturbances (paresthesias) at the T4 level, autonomic changes including temperature fluctuations in the lower extremities, and urinary incontinence. There was no history of fever or cough. On physical examination, the patient was in fair general condition, of good build, with adequate skin and mucous membrane color, no signs of respiratory distress,

kyphotic deformity in the dorsal region, paraparesis, and muscle strength of 2/5 in the lower extremities, with sensory function at the T6 level. The initial blood count showed 11,310 leukocytes/ml, with 83.6% granulocytes and 9.6% lymphocytes, and 6.8% Monocyte differentiation - inducing (MID). Screening tests for HIV and VDRL were negative. The chest X-ray was unremarkable, and no findings suggestive of immunosuppression were found. A non-contrast cervical-thoracic MRI revealed an extensive retropleural paravertebral lesion extending from T3 to T12, isointense on T1 and hyperintense on T2 (see [Figure 1](#)), as well as vertebral and disc infiltration at T7-T8. Due to indications of fracture and vertebral instability, the study was completed with a non-contrast CT scan of the cervicothoracic region, which showed marked kyphosis associated with osteolytic destruction of more than 50% of the vertebral bodies at T7-T8 (see [Figure 2](#)).



**Figure 1.** Cervical-dorsal MRI, sagittal T2 view.



**Figure 2.** Simple dorsal tomography in sagittal view.

A right posterolateral thoracotomy was performed, with the participation of the specialties of thoracic surgery and neurosurgery.

### 3. Anatomopathological Results

The caseous material analysis showed: absence of acid-fast bacilli or bacterial morphology, presence of -3 leukocytes/field, no fungal elements were observed on KOH, and the culture was negative at 48 hours.

The granulomatous tissue biopsy showed: chronic caseous (necrotizing) inflammation consistent with a tuberculous etiology.

The postoperative course was satisfactory, with pain decreasing within 24 hours and at a 4-week postoperative follow-up, with medical discharge at 2 months. Pharmacological treatment was initiated with rifampicin, isoniazid, and ethambutol, with excellent results; absence of pain, although dystonia persists in the lower extremities with paraparesis.

### 4. Discussion

Although tuberculosis can occur in immunocompetent individuals, its severe forms are more commonly observed in immunocompromised patients [12]. This differs significantly in our case, where the initial manifestation is a severe and advanced form of spinal infection. Furthermore, there is no record of any type of immunosuppression in our patient. Similarly, tuberculous spondylodiscitis occurs more frequently in patients who have suffered from this condition elsewhere in the body. In the majority of cases, there is a primary respiratory infection, followed by spinal lesions [13]. Another important point to consider is that when there is vertebral involvement under the modality of Pott's disease, the segments involved usually involve 2-3 levels [14]. In the presented clinical case, there is multilevel involvement affecting nine vertebrae of the thoracic spine, resulting in pronounced kyphosis, vertebral instability, and irreversible motor deficits in our patient. Regarding diagnosis, it is usually based on microbiological findings, demonstrating the presence of the causative organism in a sample from the body. This can sometimes be complex, as the necessary concentration of the organism may be insufficient in the tissues obtained for analysis. This was one of the important points considered when deciding on a more extensive spinal approach, involving the thoracic surgery department. This allowed for better visualization of the tissues and the collection of the largest possible sample for study, unlike the recommendations of some more conservative authors who advocate for less invasive diagnostic approaches [15].

### 5. Conclusions

The etiological diagnosis presented a challenge due to the initial presentation of symptoms in an immunocompetent

patient; however, a high suspicion of the diagnosis was supported by imaging and histopathological findings.

## Abbreviations

|      |                                      |
|------|--------------------------------------|
| TB   | Tuberculosis                         |
| IRM  | Nuclear Magnetic Resonance           |
| PD   | Pott's Disease                       |
| EE   | Spinal Epiphysis                     |
| HIV  | Human Immunodeficiency Virus         |
| VDRL | Venereal Disease Research Laboratory |
| MID  | Monocyte Differentiation - Inducing  |

## Conflicts of Interest

The authors declare no conflicts of interest.

## References

- [1] Henao Romero, S., Acevedo Gonzalez, J. C., Basto Aluja, L. E., & Moreno Luna, I. del S. (2020). Identificación de signos y síntomas para el diagnóstico del dolor lumbar de origen discogénico: revisión de mapeo [Identifying signs and symptoms for the diagnosis of discogenic low back pain: a mapping review]. *Journal of the Spanish Pain Society*, 27. <https://doi.org/10.20986/resed.2020.3803/2020>
- [2] Touzi M, Benchekaya N, Grassa R, Kammoun M. Estado actual de la tuberculosis ósea y articular de los miembros. *EMC Apar Locomot.* Marzo de 2025 [Current status of bone and joint tuberculosis of the limbs. *EMC Apar Locomot.* March 2025] [consultado el 12 de diciembre de 2025]; 58(1): 1-10. Disponible en: [https://doi.org/10.1016/s1286-935x\(25\)50060-6](https://doi.org/10.1016/s1286-935x(25)50060-6)
- [3] Ramirez-Lapausa M, Menendez-Saldana A, Noguero-Asensio A. Tuberculosis extrapulmonar, una revisión [Extrapulmonary tuberculosis, a review]. *Rev Esp Sanid Penit.* 2015 Jun; 17(1): 3–11.
- [4] Rasouli MR, Mirkoohi M, Vaccaro AR, Yarandi KK, Rahimi-Movaghar V. Spinal tuberculosis: diagnosis and management. *Asian Spine J.* 2012; 6(4): 294-308
- [5] Calderon VJR, Villalvazo BA, Hinojosa MLM, Murillo RJ. Tuberculosis vertebral: revisión de la literatura y reporte de caso. *Cir Columna.* [Vertebral tuberculosis: literature review and case report. *Spine Surgery*]. 2025; 3(2): 133-138. <https://dx.doi.org/10.35366/119624>
- [6] Bhattacharya, C., Mukherjee, T., Das, S., & Krishnan, P. (2025). Coccygeal vertebral tuberculosis. *Neurology India*, 73(3), 584–586. [https://doi.org/10.4103/ni.ni\\_96\\_22](https://doi.org/10.4103/ni.ni_96_22)
- [7] Calderon-Garciduenas AL, Jimenez-Lopez MA, Diaz-Vintimilla JJ. Enfermedad de Pott, serie de casos quirúrgicos y revisión de la literatura [Pott's disease, surgical case series and literature review]. *Rev Med Inst Mex Seguro Soc.* 2024 Jul 1; 62(4): 1-7. Spanish. <https://doi.org/10.5281/zenodo.11397264>
- [8] Ortega-Loubon C., Correa-Marquez R. Enfermedad de Pott: A proposito de un caso. *CIMEL Ciencia e Investigacion Medica Estudiantil Latinoamericana.* [Pott's Disease: A Case Report. *CIMEL Latin American Student Medical Science and Research*]. 2008; 13(2): 82-86. Recuperado de: <https://www.redalyc.org/articulo.oa?id=71720916010>
- [9] Lovaton-Espadin Rolando, Leon-Palacios Jose, Cardenas-Raymundo Luis, Ortega-Cruz Rolando, Alaba-Garcia Wesley. Abordaje tranforaminal percutaneo para el diagnostico y tratamiento de un caso de espondilodiscitis tuberculosa lumbar con absceso epidural. *Rev Neuropsiquiatria.* [Percutaneous tranforaminal approach for the diagnosis and treatment of a case of lumbar tuberculous spondylodiscitis with epidural abscess. *Rev Neuropsiquiatria*]. 2022 Jul [citado 2025 Nov 14]; 85(3): 250-255. Disponible en: <https://dx.doi.org/10.20453/mp.v85i3.4334>
- [10] Freixinet J, Hussein M, Rodriguez Suarez P, Mhaidli H, Robaina F, Rodriguez Castro F. Abordaje transtoracico de la columna vertebral. *Arch Bronconeumologia.* [Transthoracic approach to the spine. *Arch Bronconeumologia*]. Noviembre de 1998 [consultado el 12 de diciembre de 2025]; 34(10): 492-5. Disponible en: [https://doi.org/10.1016/s0300-2896\(15\)30355-0](https://doi.org/10.1016/s0300-2896(15)30355-0)
- [11] Celis V, Ibanez-Reluz M. Enfermedad de Pott, reto diagnostico y terapeutico: reporte de caso. *Acta Med Peru.* [Pott's disease, diagnostic and therapeutic challenge: case report. *Acta Med Peru*]. 2024; 41(3): 206-12. <https://doi.org/10.35663/amp.2024.413.2905>
- [12] Morales Aguirre Jose Juan, Ornelas Carsolio Maria Elena, Gomez Barreto Demostenes. Infeccion por Mycobacterium Tuberculosis en pacientes infectados por el virus de inmunodeficiencia humana. [Mycobacterium Tuberculosis infection in patients infected with the human immunodeficiency virus] *Bol. Med. Hosp. Infant. Mex.* [revista en la Internet]. 2004 Feb [citado 2025 Dic 06]; 61(1): 87-98. Disponible en: [http://www.scielo.org.mx/scielo.php?script=sci\\_arttext&pid=S1665-11462004000100011&lng=es](http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1665-11462004000100011&lng=es)
- [13] Medina-Peñasco, Rolando Joshua; Rosas-Ramirez, Martha Imelda; Barragan-Hervella, Rodolfo Gregorio; Alvarado-Ortega, Ivan; Lopez-Cazares, Gerardo; Montiel-Jarquín, Alvaro Jose; Romero-Figueroa, Maria del Socorro. Tuberculosis de columna vertebral: experiencia en un hospital de tercer nivel en Puebla, Mexico. [Tuberculosis of the spine: experience in a tertiary hospital in Puebla, Mexico] *Revista Medica del Instituto Mexicano del Seguro Social*, vol. 55, núm. 1, 2017 Instituto Mexicano del Seguro Social, Mexico.
- [14] Chang-Hua Chen, Yu-Min Chen, Chih-Wei Lee, Yu-Jun Chang, Chun-Yuan Cheng, Jui-Kuo Hung. Early diagnosis of spinal tuberculosis. *Journal of the Formosan Medical Association*, Volume 115, Issue 10, 2016, Pages 825-836.
- [15] Rosales-Olivares LM, Valle-Cerna I, Alpizar-Aguirre A, et al. Evaluación de la biopsia percutánea en el diagnóstico del síndrome de destrucción vertebral torácico y lumbar. [Evaluation of percutaneous biopsy in the diagnosis of thoracic and lumbar vertebral destruction syndrome]. *Cir Cir.* 2007; 75(6): 459-463.