ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

www.surgicalneurologyint.com

Surgical Neurology International

Editor-in-Chief: Nancy E. Epstein, MD, Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook.

SNI: Spine

Editor
Nancy E. Epstein, MD
Clinical Professor of Neurological Surgery, School of Medicine, State U. of NY at Stony Brook

SNI
Open Access

Case Report

Spinal tuberculosis: A case series and a literature review

Rully Hanafi Dahlan, Sevline Estethia Ompusunggu, Yustinus Robby Budiman Gondowardojo, Radityo Priambodo, Samuel Willyarto Anugerah

Department of Neurosurgery, Padjadjaran University, Bandung, West Java, Indonesia.

E-mail: *Rully Hanafi Dahlan - rullyspinebandung@gmail.com; Sevline Estethia Ompusunggu - sevlineestethia@gmail.com; Yustinus Robby Budiman Gondowardojo - yustinusrobby@gmail.com; Radityo Priambodo - dr.radityo@gmail.com; Samuel Willyarto Anugerah - sammywa90@gmail.com

***Corresponding author:**
Rully Hanafi Dahlan,
Department of Neurosurgery,
Padjadjaran University,
Bandung, West Java, Indonesia.

rullyspinebandung@gmail.com

Received : 03 December 2021
Accepted : 02 March 2022
Published : 13 May 2022

DOI
10.25259/SNI_1201_2021

Quick Response Code:

ABSTRACT

Background: Spinal tuberculosis (TB) is a common form of extrapulmonary TB. Although the first line of the treatment is anti-TB medications, patients with severe neurological deficits, spinal instability, and/or kyphotic deformity often warrant surgery. Here, we report five cases of spinal TB requiring operative intervention at Hasan Sadikin General Hospital, Bandung, Indonesia.

Case Description: We operated on five patients with spinal TB cases from 2019 to October 2021. In addition to appropriate medical management, all five patients successfully underwent laminectomy with or without posterior stabilization.

Conclusion: It is essential to establish the diagnosis and surgically manage patients with spinal TB early in the clinical course to minimize residual post-operative neurological deficits.

Keywords: Diagnosis, Management, Pott's disease, Spinal tuberculosis, Spondylitis tuberculosis

INTRODUCTION

Tuberculosis (TB) is responsible for 1.3 million deaths annually.[4] In 2020, 1.5 million people died from TB (including 214,000 people with HIV). In 2020, another 10 million people have symptomatic TB worldwide.[7] Extrapulmonary TB is accounts for approximately 10% of all TB cases, 2% of which are found in the spine. Here, we appropriately diagnosed and surgically treated five patients with spinal TB and reviewed the appropriate literature.

CASE DESCRIPTION

Five patients diagnosed with spinal TB with the average age are 25.8 years old, and included two males and three females [Table 1]. Four patients presented with paraparesis and one patient presented with low back pain that radiates to both legs. MR studies showed hypointense to isointense lesion in T1-weighted images and isohyperintense and hyperintense lesion in T2-wighted images [Figures 1-5]. CT scan showed destruction of vertebral body, pathological fracture, and kyphotic deformity [Figure 6]. Intervention given includes laminectomy debridement and decompression with or without posterior stabilization. Postoperatively, two patients demonstrated partial recoveries of neurological function and three patients demonstrated full recoveries of neurological function. Postoperative MRI/CT

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.
©2022 Published by Scientific Scholar on behalf of Surgical Neurology International

Table 1: Clinical characteristics of the patients.

Average age (range)	25.8 years old (14–52 years old)
Sex	
Male	2
Female	3
Preoperative Neurological Deficit	
Quadriparesis	0
Paraparesis	4
Low back pain	1
Preoperative MR	
Patient 1 (52 years old)	T1-weighted image: isohypointense mass at intervertebral disc and vertebral body of L4 and L5 T2-weighted image: isohyperintense mass at intervertebral disc L4-L5 and vertebral body of L4-5
Patient 2 (22 years old)	T1-weighted image: isointense mass, in-homogeneously enhanced with contrast administration at level T12 and L1 T2-weighted image: hyperintense mass at T12 and L1, destruction of vertebral body, and intervertebral disc, paraspinal and retro-spinal abscess, and pathological fracture at T12 and L1
Patient 3 (21 years old)	T1-weighted images: hypointense mass in the lumbosacral region T2-weighted images: hyperintense mass in the paravertebrae at the L1–L4 level
Patient 4 (14 years old)	T1-weighted images: Extradural isointense lesions at T6–T8 and L1, which intensify inhomogeneously with contrast administration, bone destruction (+) T2-weighted images: extradural isohyperintense lesion at T6–T8 and L1, bone destruction (+) Canal stenosis at T6–T8, and L1 Kyphotic angle 16°
Patient 5 (20 years old)	Lesion at T2 vertebral body, compression fracture of the vertebral bodies of T11 and T12
Preoperative CT/X-ray	
Patient 1 (52 years old)	Widening of intervertebral space L4-5 with destruction of adjacent vertebral body endplate
Patient 2 (22 years old)	Destruction of vertebral body at T12 and L1, pathological fracture at T12 and L1, and kyphotic deformity
Patient 3 (21 years old)	Malalignment, deformity of L2 vertebral body, kyphotic angle 21°, and Cobbs angle 28°
Patient 4 (14 years old)	Isodense mass at the right lung that extends to the left lung (not enhanced with contrast administration), compression fracture at T6–T8 and L1 vertebrae.
Average age (range)	25.8 years old (14–52 years old)
Patient 5 (20 years old)	Hyperdense lesion at T2 vertebral body, compression fracture of the vertebral bodies of T11 and T12
Postoperative Neurological Deficit	
Partial Resolution	2
Full Resolution	3
Postoperative MR/CT	Bony healing with improvement of deformity
Antibiotic therapy	Isoniazid, rifampicin, pyrazinamide, and ethambuthol are administered for 2 months and followed by isoniazid and rifampicin for 7 months

demonstrated progressive bony healing with improvement of deformity.

DISCUSSION

Medical treatment is the mainstay of the treatment for spinal TB, with surgical interventions indicated in certain circumstances.[3] Certain situations that necessitate surgical management include: failure to respond to chemotherapy or recurrence, severe weakness at presentation, and persistent or progressive neurological deficit even after starting chemotherapy, instability, incapacitating pain, and deformities.[6] The objectives of the surgical intervention are (1) abscess drainage, (2) debridement of infected material, or (3) debridement and fusion with or without stabilization. Chemotherapy alone resolves the majority of cold abscesses and drainage is only recommended in certain situations, such as respiratory distress or dysphagia caused by a large cervical paravertebral abscess, and pseudo–hip flexion deformity caused by a large psoas abscess. Debridement alone does not prevent deformity progression or improve healing rates, particularly in children, where it can cause physeal damage and rapid deformity progression.[5]

The literature describes three surgical approaches for treating spinal tuberculosis (TB): the anterior approach, the posterior approach, and the combined approach (combined anterior and posterior approach).[2,8] The anterior approach is the most convenient for debriding/reconstructing defects because it provides direct access to the infected region and a larger operational horizon than the other two approaches.[1] Initially, the posterior approach is not a routine method, but rather an alternative treatment in patients when the anterior approach is risky and cannot be performed. However, many recent studies have found that the posterior approach is superior to the anterior approach in the correction of deformity.

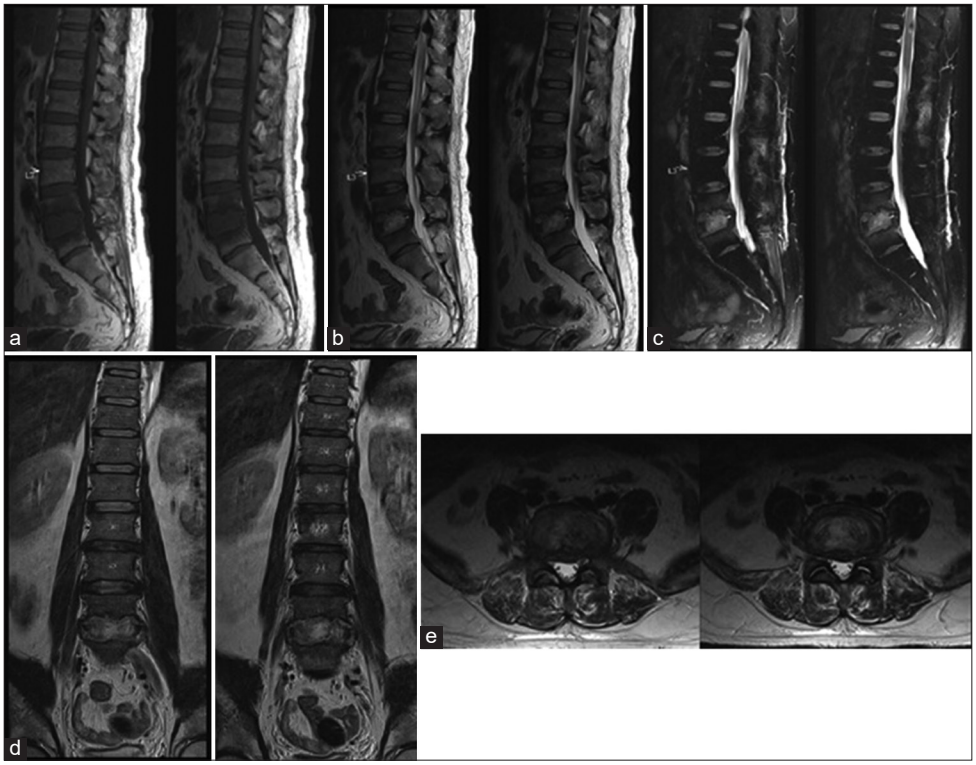

Figure 1: Thoracolumbar MRI of spinal TB in 52-year-old male; (a)T1-weighted image showed isohypointense mass at intervertebral disc L4-L5 and vertebral body of L4-5; (b)T1-weighted image showed isohypointense mass which inhomogeneously enhanced with contrast administration at intervertebral disc L4-L5; (c)T2-weighted image showed isohyperintense mass at intervertebral disc L4-L5 and vertebral body of L4-5; (d) Coronal view; (e)Axial view.

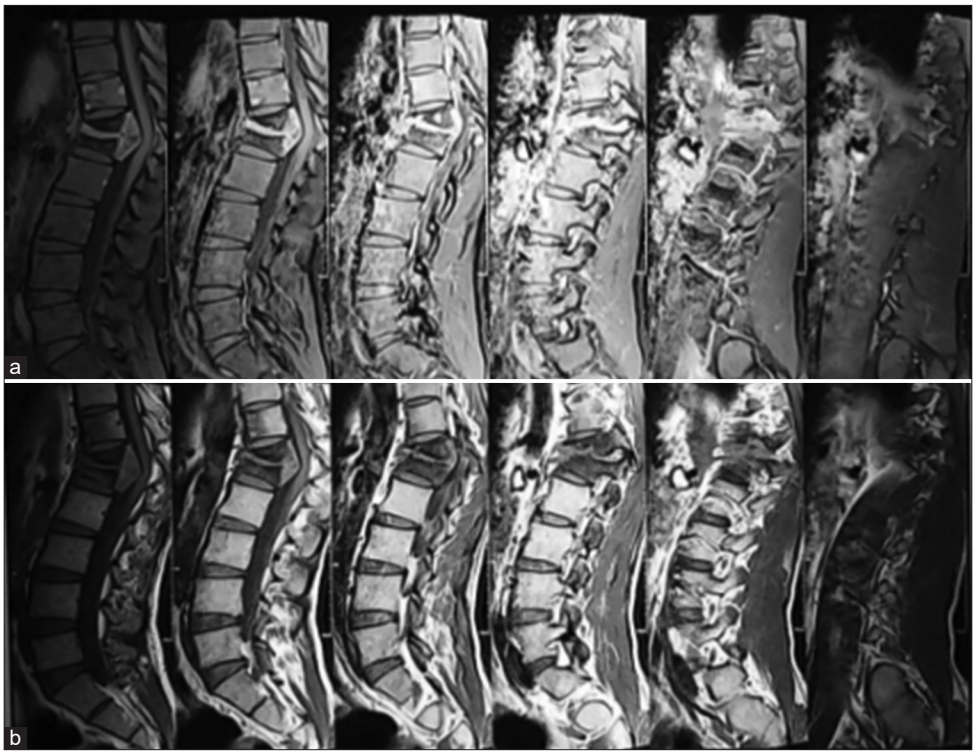

Figure 2: (a-b) Thoracolumbar MRI in a 22-year-old male with spinal TB. T1-weighted image showed isointense mass which inhomogeneously enhanced with contrast administration at level T12-L1. T2-weighted image showed hyperintense mass at T12-L1, destruction of vertebral body, and intervertebral disc, paraspinal and retro-spinal abscess, and pathological fracture at T12 and L1.

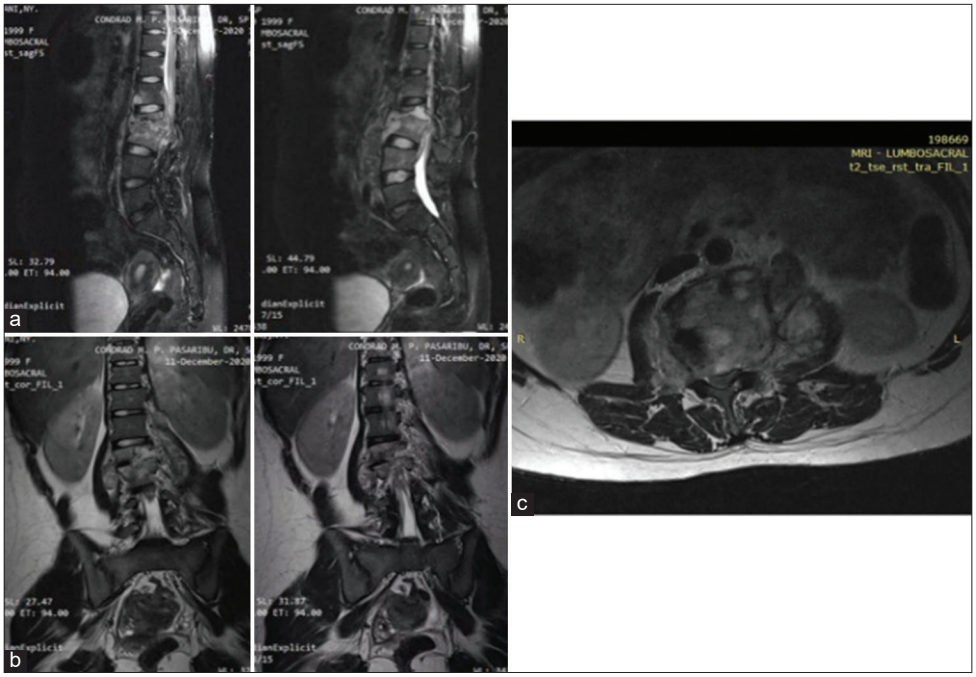

Figure 3: Thoracolumbar MRI in a 21-year-old female with spinal TB. Noncontrast MRI in the lumbosacral region showed hypointense (in T1-weighted images) and hyperintense (in T2-weighted images) mass in the paravertebrae at the L1-L4 level. (a) Sagital view; (b) Coronal view; (c) Axial view.

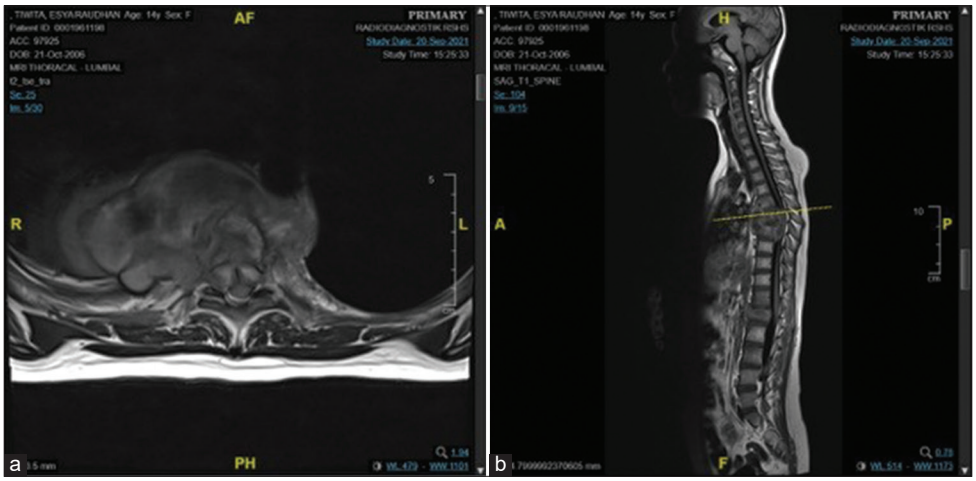

Figure 4: MRI of spinal TB in a 14-year-old female. T1-weighted images showed extradural isointense lesions at T6–T8 and L1, which intensify inhomogeneously with contrast administration. Note also that there is bone destruction. T2-weighted images showed extradural isohyperintense lesion at T6–T8 and L1 with bone destruction, canal stenosis at T6-T8, and L1, and kyphotic angle 16°. (a) Axial view ; (b) Sagital view.

Yang *et al*. provide evidence for anterior, posterior, and combined surgical approaches for spinal TB. However, the combined approaches require significantly longer operation times and more blood loss versus anterior alone procedures. Ultimately, Yang *et al*. concluded that posterior approaches offered better clinical outcomes.[8] When Bian *et al*. evaluated the three approaches to spinal TB they found that the operative time was significantly longer in the combined surgery (i.e., with more complications) versus the other two approaches performed alone. Further, the all three approaches offered similar degrees of correction of kyphosis and similar degrees of neurological improvement.[2]

Spinal TB involving the thoracolumbar region is biomechanically challenging and the surgical options with thoracolumbar involvement are anterior debridement and reconstruction with posterior pedicle screws or a posterior-

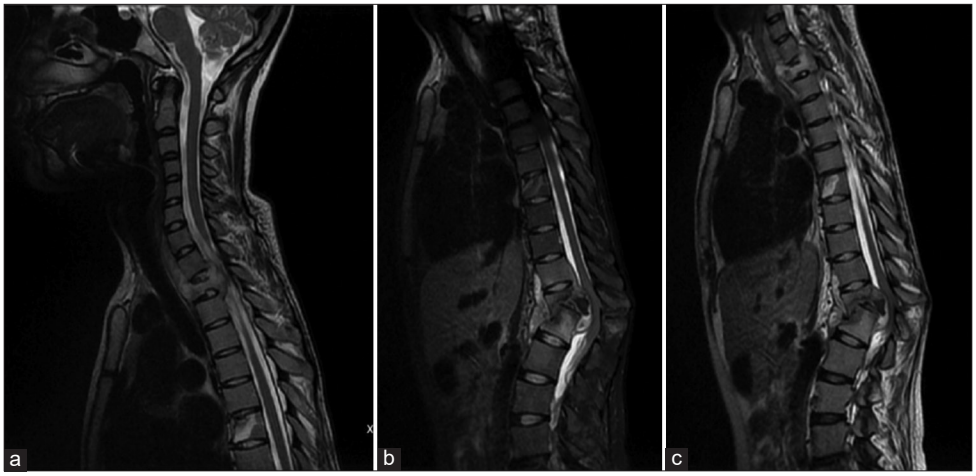

Figure 5: MRI of spinal TB in 20-year-old female. (a) Contrast MRI showed lesion at corpus vertebrae at T2 level;(b-c) compression fracture of the corpus vertebrae at T11 and T12 level.

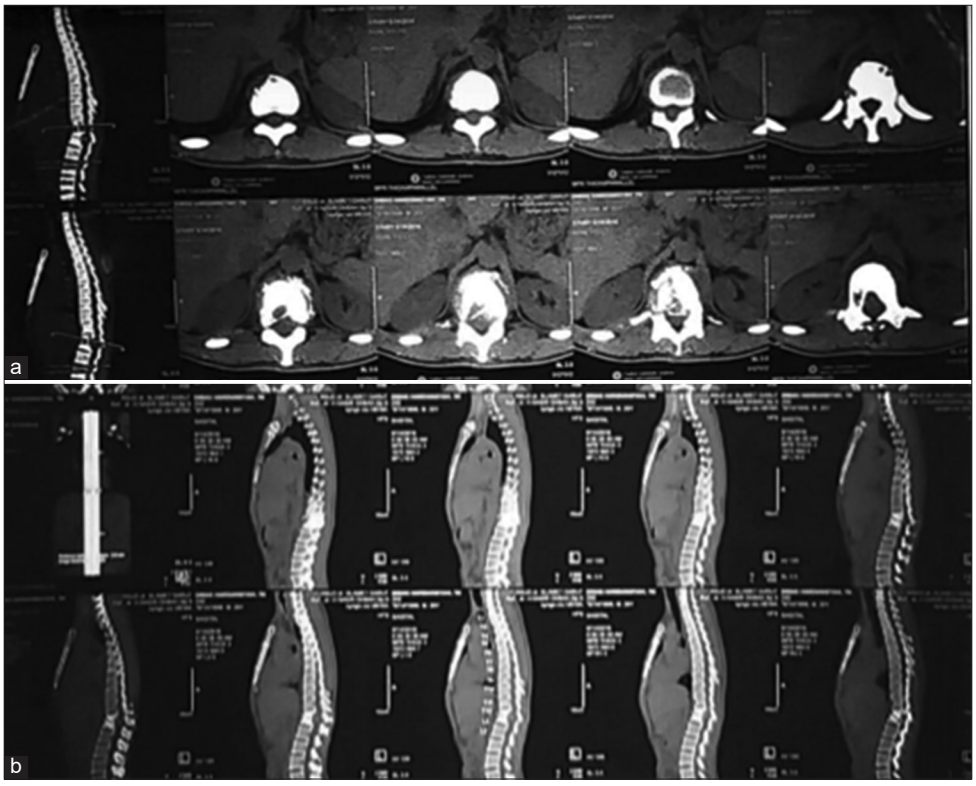

Figure 6: (a-b) Thoracolumbar CT in a 22-year-old male with spinal TB showed destruction of vertebral body at T12 and L1, pathological fracture at T12 and L1, and kyphotic deformity.

only approach.[3] In our patient, the affected segment is in the thoracolumbar segment. We performed laminectomy with or without posterior stabilization (posterior approach in all five patients based on the location of the pathology), with drainage, and debridement and it resulted in excellent outcomes.

CONCLUSION

Spinal TB should optimally be quickly diagnosed and appropriately surgically managed (where needed) to achieve the best postoperative outcomes.

Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Benli IT, Kaya A, Acaroğlu E. Anterior instrumentation in tuberculous spondylitis: Is it effective and safe? Clin Orthop Relat Res 2007;60:108-16.
2. Bian Z, Gui Y, Feng F, Shen H, Lao L. Comparison of anterior, posterior, and anterior combined with posterior surgical treatment of thoracic and lumbar spinal tuberculosis: A systematic review. J Int Med Res 2019;48:300060519830827.
3. Dunn RN, Ben Husien M. Spinal tuberculosis review of current management. Bone Joint J 2018;100-B:425-31.
4. Miller AG, Spicer PJ. Extrapulmonary tuberculosis: A case report involving the spine and soft tissues. Radiol Case Rep 2021;16:2236-9.
5. Rajasekaran S, Soundararajan DC, Shetty AP, Kanna RM. Spinal tuberculosis: Current concepts. Glob Spine J 2018;8 4 Suppl:96S-108.
6. Shetty A, Kanna RM, Rajasekaran S. TB spine-current aspects on clinical presentation, diagnosis, and management options. Semin Spine Surg 2016;28:150-62.
7. Tuberculosis. Available from: https://www.who.int/news-room/fact-sheets/detail/tuberculosis [Last accessed on 2021 Oct 31].
8. Yang P, Zang Q, Kang J, Li H, He X. Comparison of clinical efficacy and safety among three surgical approaches for the treatment of spinal tuberculosis: A meta-analysis. Eur Spine J 2016;25:3862-74.

How to cite this article: Dahlan RH, Ompusunggu SE, Gondowardojo YR, Priambodo R, Anugerah SW. Spinal tuberculosis: A case series and a literature review. Surg Neurol Int 2022;13:196.