

Original Research Article

A RETROSPECTIVE ANALYSIS OF SURGICAL MANAGEMENT OF SPINAL TUBERCULOSIS PATIENTS AT A TERTIARY CARE HOSPITAL

Vivek Tomar¹, Abhinav Bansal²

¹Assistant Professor, Department of Neurosurgery, Subharti Medical College, Meerut, Uttar Pradesh, India.

²Associate Professor, Department of Neurosurgery, Subharti Medical College, Meerut, Uttar Pradesh, India.

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Corresponding Author:

Dr. Abhinav Bansal,
Associate Professor, Department of
Neurosurgery, Subharti Medical
College, Meerut, Uttar Pradesh, India.
Email: drabhinavb@gmail.com.

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ABSTRACT

Background: Spinal tuberculosis represents a severe manifestation of tuberculosis, constituting nearly fifty percent of all instances of musculoskeletal tuberculosis. The present study was conducted to analyze surgical management of spinal tuberculosis patients.

Materials & Methods: A total of 50 patients with presence of spinal TB were enrolled. Comprehensive demographic and clinical information for all patients was gathered. Enrollment was limited to those individuals presenting with moderate to severe spinal cord compression who underwent surgical intervention. Data regarding medical history, clinical examination, imaging studies, postoperative outcomes, and follow-up assessments were systematically collected using a standardized data collection form and subsequently analyzed. The surgical technique employed involved thoracotomy, anterolateral decompression, and the application of autogenous strut bone grafting, accompanied by concurrent fixation utilizing screws and rods. All patients received appropriate anti-tuberculosis medications for a duration of two years.

Results: A total of 50 patients were evaluated. Mean age of the patients was 49.2 years. 62 percent of the patients were males. A thoracotomy accompanied by anterolateral decompression and the application of autogenous strut bone grafting, along with concurrent fixation using screws and rods, was executed in 25 percent of the patients. In contrast, posterior decompression, posterior interbody fusion, and posterolateral fusion utilizing bone grafts, supported by transpedicular screws and rods, were carried out in the remaining 75 percent of the cases. Complications were seen in 20 percent of the patients. The most common complication was surgical infection. Significant improvement in the neurological function was seen.

Conclusion: The surgical intervention for spinal tuberculosis and Pott's disease is both safe and effective, yielding favorable clinical and radiological results.

Key words: Spinal, Tuberculosis, Surgical.

INTRODUCTION

Spinal tuberculosis represents a severe manifestation of tuberculosis, constituting nearly fifty percent of all instances of musculoskeletal tuberculosis. This condition is predominantly observed in pediatric and young adult populations.^[1] Notably, the prevalence of spinal tuberculosis is on the rise in developed countries. Recent studies have indicated a genetic predisposition to this form of tuberculosis.^[2] The

disease is characterized by the destruction of the intervertebral disc space and the adjacent vertebral bodies, leading to the collapse of spinal structures and anterior wedging, which results in kyphosis and the formation of a gibbus. The thoracic region of the vertebral column is the most commonly affected area. Additionally, the development of a 'cold' abscess surrounding the lesion is a distinctive feature of this condition.^[3] Antituberculous therapy remains the primary treatment approach, although

surgical intervention may be necessary in certain cases, such as significant abscess formation, severe kyphosis, progressive neurological deficits, or inadequate response to medical treatment. With prompt diagnosis and treatment, the overall prognosis is generally favorable.^[4-6] The clinical picture of spinal TB is extremely variegated. Spinal TB usually is insidious in onset and the disease progresses at a slow pace. The diagnostic period, since onset of symptoms, may vary from 2 weeks to several years. The manifestation of spinal TB depends on the severity and duration of the disease, site of the disease, and the presence of complications such as abscess, sinuses, deformity, and neurological deficit.^[7-9] Hence; the present study was conducted to analyze surgical management of spinal tuberculosis patients.

MATERIALS AND METHODS

The present study was conducted to analyze surgical management of spinal tuberculosis patients. A total of 50 patients with presence of spinal TB were enrolled. Comprehensive demographic and clinical information for all patients was gathered. Enrollment was limited to those individuals presenting with moderate to severe spinal cord compression who underwent surgical intervention. Data regarding medical history, clinical

examination, imaging studies, postoperative outcomes, and follow-up assessments were systematically collected using a standardized data collection form and subsequently analyzed. The surgical technique employed involved thoracotomy, anterolateral decompression, and the application of autogenous strut bone grafting, accompanied by concurrent fixation utilizing screws and rods. All patients received appropriate anti-tuberculosis medications for a duration of two years. Data analysis was conducted using SPSS for Windows.

RESULTS

A total of 50 patients were evaluated. Mean age of the patients was 49.2 years. 62 percent of the patients were males. A thoracotomy accompanied by anterolateral decompression and the application of autogenous strut bone grafting, along with concurrent fixation using screws and rods, was executed in 25 percent of the patients. In contrast, posterior decompression, posterior interbody fusion, and posterolateral fusion utilizing bone grafts, supported by transpedicular screws and rods, were carried out in the remaining 75 percent of the cases. Complications were seen in 20 percent of the patients. The most common complication was surgical infection. Significant improvement in the neurological function was seen.

Table 1: Complications

Complications	Number	Percentage
Surgical infection	2	4
Deep infection	1	2
Revision surgery	1	2
Malposition of screws	1	2
Overall	10	20

Table 2: Comparison of preoperative and postoperative neurological function as assessed by ASIA grading

ASIA grading	Preoperative	Postoperative	p-value
A	18	1	0.001 (Significant)
B	15	1	
C	10	1	
D	5	14	
E	2	33	
Total	50	50	

DISCUSSION

Tuberculosis (TB) is attributed to the *Mycobacterium tuberculosis* complex, which comprises approximately 60 species. Among these, only a few, namely *Mycobacterium tuberculosis* (the predominant species), *Mycobacterium bovis*, *Mycobacterium microti*, and *Mycobacterium africanum*, are recognized as pathogenic to humans. This organism is characterized as a slow-growing, fastidious, aerobic bacillus. Infections primarily localize in the lungs, but can also affect the lymph nodes of the mediastinum, mesentery, gastrointestinal tract, genitourinary system, or other visceral organs. The bacilli have a propensity to remain dormant for extended durations and can

replicate every 15 to 20 hours under aerobic conditions when circumstances are conducive. Spinal infections are typically secondary, resulting from the hematogenous spread of the bacillus from an initial site of infection. From an anatomical perspective, the intervertebral disc is avascular, with the paradiscal arteries branching on either side of the disc to supply the subchondral regions of the upper and lower endplates. This vascular arrangement promotes the involvement of subchondral bone adjacent to the disc, a pattern referred to as "paradiscal," which is the most frequently observed type. As the vertebral body undergoes progressive destruction, spinal deformities such as kyphosis may develop.^[6-9]

Hence; the present study was conducted to analyze surgical management of spinal tuberculosis patients. A total of 50 patients were evaluated. Mean age of the patients was 49.2 years. 62 percent of the patients were males. A thoracotomy accompanied by anterolateral decompression and the application of autogenous strut bone grafting, along with concurrent fixation using screws and rods, was executed in 25 percent of the patients. In contrast, posterior decompression, posterior interbody fusion, and posterolateral fusion utilizing bone grafts, supported by transpedicular screws and rods, were carried out in the remaining 75 percent of the cases. Complications were seen in 20 percent of the patients. The most common complication was surgical infection. Significant improvement in the neurological function was seen. Srinivasa R et al summarized findings of Surgical Management of Spinal Tuberculosis. The average age was 42.5 years. The most common location was thoracic (28 patients), followed by lumbar (20 patients), cervical (16 patients), and thoracolumbar (6 patients). Twenty patients had epidural abscess with cord compression. All patients who presented within 4 weeks of onset of symptoms showed a statistically significant improvement postsurgery. Sixteen patients with epidural abscess had good neurological recovery immediately after surgery (ASIA B to ASIA D/E). Four patients with epidural abscess with late presentation remained ASIA A after surgery. All patients had good fusion rates (follow-up X-ray) at 1 year. After ATT course completion, all patients had complete eradication of disease (MRI spine). Surgical treatment for spinal TB, if performed early (within 4 weeks) with good decompression, results in satisfactory clinical outcome with early improvement in the neurological deficits.^[10] Yong LN et al assessed the recent evidence on functional outcomes in spinal tuberculosis, highlighting functional recovery, assessment tools for functional measures, and associative factors for functional recovery. Using PubMed, a literature search was done using the terms “spinal tuberculosis,” “tuberculous spondylitis,” “tuberculous spondylodiscitis,” and “functional outcome” for original articles published between January 2010 and December 2019. A total of 191 search results were found. Detailed screening showed that 19 articles met the eligibility criteria: 13 of these focused on surgical methods, four on conservative management, and two on rehabilitation approaches. The outcome measures used for functional

assessment were the Oswestry Disability Index (11 articles), Japanese Orthopaedic Association score (n=3), modified Barthel Index (n=2), Functional Independence Measure (n=2), and 36-item Short-Form Health Survey (n=1). Functional outcome was mainly affected by pain, spinal cord compression, and inpatient rehabilitation. No significant difference in functional outcome was found between conservative management and surgery for cases with uncomplicated spinal tuberculosis. Most studies focused on surgery as the mode of treatment and used pain-related functional measures; however, these assessed functional limitations secondary to pain, and not neurological deficits.^[11]

CONCLUSION

The surgical intervention for spinal tuberculosis and Pott's disease is both safe and effective, yielding favorable clinical and radiological results.

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