

Original Research Article

Postoperative outcome in thoracolumbar spinal tuberculosis: a retrospective study

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ABSTRACT

Background: Spinal tuberculosis is the most common location of extra pulmonary tuberculosis. ATT alone may not be suitable in all situations, especially when treating patients with risk of instability, progression of neurologic deficit, and failure of medical treatment. Surgical intervention is a major treatment modality for symptom relief in spinal tuberculosis.

Methods: The aim of this study was to assess the immediate post-operative outcome in surgically treated patients with dorsolumbar spine tuberculosis at Department of Neurosurgery Government Medical College, Thrissur. All operated patients of dorsolumbar spinal tuberculosis during 2014 September to 2019 August were included under study.

Results: A total of 57 patients were included in the study. The mean age of the patient was 42.77 years. There were 40 males (70.2%) and 17 females (29.8%). 55 (96.5%) out of 57 patients were having sensory symptoms. 41 (71.9%) out of 57 patients were having motor symptoms. Bladder involvement 23 (40.4%) and bowel involvement 15 (26.3%) were also noted in the study. Sensory symptoms improvement in post-operative period was noted in 46 (80.7%). Motor symptoms improvement was observed in 23 (56.1%) out of 41. Bladder symptoms improved in 6 (26.1%) out of 23. There is improvement in clinical symptoms, neurological function immediately after surgery. Surgical patients have faster improvement and can be mobilized earlier. Improvement in sensory symptoms (96.5%), motor symptoms (56.1%) and bladder symptoms (26.1%) were noted in our study in the immediate post-operative period.

Conclusions: There was significant immediate relief in symptoms and morbidity of patients undergoing surgical treatment for dorsolumbar spine tuberculosis.

Keywords: Postoperative outcome, Spinal tuberculosis, Thoracolumbar

INTRODUCTION

The bone and joint tuberculosis is the most common type of extra-pulmonary tuberculosis (TB). Spinal TB is the most common location of extra pulmonary tuberculosis.¹ Recently, due to HIV infection, bacterial resistance, and population migration, tuberculosis has become a leading cause of death in adults, especially in developing countries, with 1.4 million people dying of tuberculosis every year.² Historically, the treatment for spinal tuberculosis has been conservative and has included the methods such as immobilization using body casts or

plaster beds and a diet of nutritious food.³ After anti-tuberculous drugs became available for clinical use, many studies indicated that the administration of anti-TB drugs alone could effectively heal tuberculosis.⁴⁻⁷ It may not be suitable in all situations, especially when treating patients with risk of instability, progression of neurologic deficit, and failure of medical treatment. In such patients surgical treatment is needed to prevent and correct spinal deformity, to improve neurological function, and to reconstruct spinal stability.⁸⁻¹⁰ The presence of neurological deficit is one of the indications for surgical intervention in TB spine.¹¹ The posterior only

approaches have been gaining popularity because of increased morbidity in using an anterior approach and frequent need for the use of another specialist surgeon.^{12,13} The purpose of this study is to assess the immediate post-operative outcome in surgically treated patients with dorsolumbar spine tuberculosis.

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METHODS

It was a retrospective cohort study conducted in Department of Neurosurgery Government Medical College, Thrissur, Kerala. All operated patients of dorsolumbar spinal tuberculosis during 2014 September to 2019 August were included under study.

Data was retrieved from case records of patients admitted during study period from records library. Case sheets of the patients who underwent surgery for dorsolumbar spine tuberculosis in Neurosurgery department of Government Medical College, Thrissur in the specified time period were collected. Preoperative clinical and radiological investigation and immediate postoperative clinical and radiological assessment written in case sheet was recorded. Clinical assessments include motor system findings, sensory system findings, bladder and bowel involvement and visual analogue scale (VAS) score preoperatively and postoperative till the day of discharge. Motor system findings recorded are power and tone of the patient. Sensory findings recorded are touch and pain. Radiological assessment included MRI, CT and X-ray findings preoperatively and post fixation X-ray for adequacy of deformity correction. Statistical analysis was done using SPSS software and level of significance determined by calculating p value (<0.05).

RESULTS

A total of 57 patients were include in the study. The mean age of the patient was 42.77±14.82 years. There were 40 males (70.2%) and 17 females (29.8%). 29 (50.9%) patients were having dorsal level, 19 (33.3%) lumbar and 9 (15.8%) dorsolumbar junction disease (Figure 1). Of the 57 patients 10 (17.5%) were diabetic and 4 (7%) were hypertensive. Positive family history or contact history was obtained in 16 (28.1%) patients.

55 (96.5%) out of 57 patients were having sensory symptoms (pain, numbness and paresthesia). 41 (71.9%) out of 57 patients were having motor symptoms (weakness of different grades). Bladder involvement 23 (40.4%) and bowel involvement 15 (26.3%) were also noted in the study.

ESR less than 50 in 34 (59.6%), 50-100 in 18 (31.6%) and more than 100 in 5 (8.8%). MRI was found to be

suggestive of tuberculosis in 53 (93%) and Mantoux was positive in 16 (28.1%) patients.

Table 1: Patient characteristics.

Patient characteristics	N
Number	57
Mean age in years	42
17-40	19
40-60	34
>60	4
Male:female	40:17 (2.4:1)
Comorbidities	
DM	10
HT	4

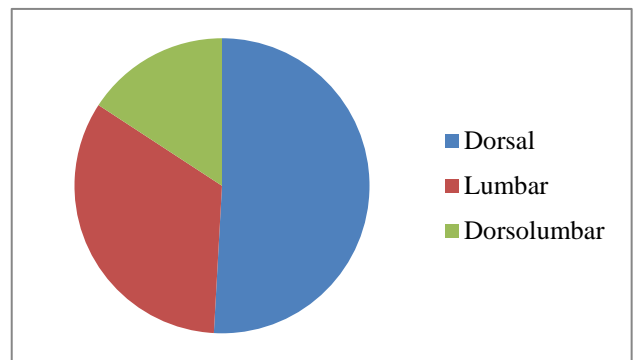


Figure 1: Level of lesion.

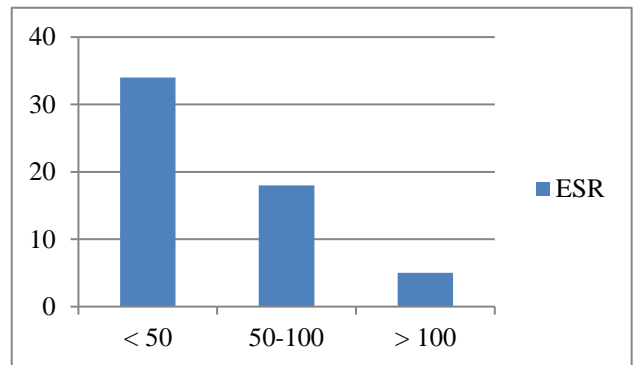


Figure 2: ESR test.

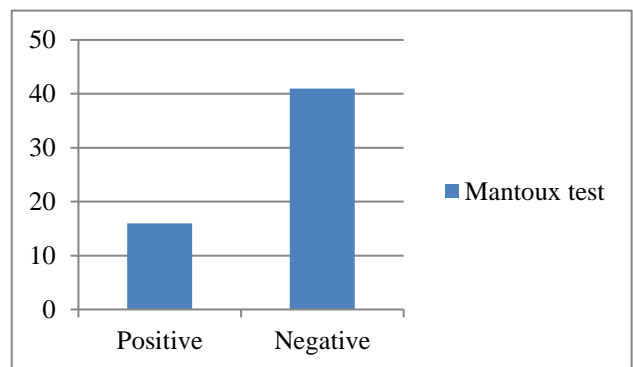


Figure 2: Mantoux test.

Sensory symptoms improvement or modification in post-operative period was noted in 46 (80.7%). Motor symptoms improvement was observed in 23 (56.1%) out of 41. Bladder symptoms improved in 6 (26.1%) out of 23. No improvement in bowel symptoms noted in 10-15 days of post-operative stay in any patients. Post-operative X-ray in 53 (92.9%) of 57 patients noted screws in good position with adequate decompression. Three of them showed screws traversing disc space and pedicle breach and 1 case of screw pullout and rod displacement.

Motor improvement was found to be more in females. Though total number of females were only 17 and 11 of them had motor symptoms, 9 had improvement of motor symptoms post-operatively. So, relationship between female sex and improvement of motor symptoms was found to be significant ($p < 0.034$). Sensory improvement was also more among females. All females with sensory symptoms 17 (100%) had improvement of symptoms while only 29 (76.3%) males had improvement (p value 0.055%). Those with preoperative ATT had better bladder symptoms outcome. All 6 patients who had bladder symptom improvement were on ATT preoperatively (p value < 0.05).

Table 2: Post-operative motor improvement.

Sex	Post-operative motor improvement			
	Yes	No	NA	Total
Male	14	17	9	40
Female	9	2	6	17
Total	23	19	15	57

Table 3: Post-operative sensory improvement.

Sex	Post-operative sensory improvement			
	Yes	No	NA	Total
Male	29	9	2	40
Female	17	0	0	17
Total	46	9	5	57

DISCUSSION

Spinal tuberculosis has been around for a very long time. Despite its common occurrence and the high frequency of long-term morbidity, there are no straightforward guidelines for the diagnosis and treatment of spinal tuberculosis.¹⁴ Majority of patients of spinal tuberculosis respond very well to medical treatment.¹⁴ But in patients if there is a risk of instability, progression of neurologic deficit, and failure of medical treatment, surgical treatment is required.

Spinal surgery involves removing the spinal cord lesion, relieving nerve compression, and reconstructing spinal stability, which effectively relieves spinal cord compression and prevents kyphosis. Early diagnosis and prompt treatment are necessary to prevent permanent neurological disability and to minimize spinal

deformity.^{15,16} Posterior laminectomy and pedicle screw fixation with titanium screws and rods were used in all patients.

According to literature TB spine is more common in older individuals.²⁵ In consistent with previous studies our study shows that mean age of patient was 42.77 (17-74 years of age). Males are more commonly affected according to other studies in the ratio of 1.5:1 to 2:1, same was found in our study 2:1 (40 males to 17 females).^{21,25} In our study spine tuberculosis common in dorsal region 66.7% which was comparable to previous studies (66%).²⁵ Motor symptoms were less common presentation in all studies. Almost all patients had some sensory symptoms like back ache, numbness or radicular pain.²⁵ In our study 55 (96.5%) had sensory symptoms and 41 (71.9%) had motor symptoms. Duration of symptoms in our study varied from 3 weeks to 18 months.

Various studies report different surgical indications; however, the current clinically recognized indications for surgery are: severe back ache and/or radicular pain resistant to conservative treatment, developing neurological deficit, significant kyphosis ($> 30^\circ$), or progressive deformity.^{17,18} As of now, several surgical approaches have been introduced, including anterior spinal fusion, anterior-posterior spinal fusion, posterior spinal fusion alone, and posterior spinal fusion followed by anterior spinal fusion. The surgical method used in any given case varies according to neurological deficits, spinal deformities, abscesses, and radicular or dural compression.¹⁸

Investigation of choice for radiological evaluation of patients is by MRI for detecting lesions of spinal tuberculosis, particularly at the initial stages, showing as bone marrow edema, and increased signal intensity of the intervertebral disc on T2 images, where the sensitivity reaches up to 95%.¹⁹ In our study MRI spine and CT spine both plain and contrast was done and ESR along with Mantoux and CXR were taken as supportive evidence.

There is improvement in clinical symptoms, neurological function and deformity immediately after surgery. Surgical patients have faster improvement and can be mobilised earlier.²⁰ Further improvement in neurological function and fusion can be seen at follow up.²⁰ Improvement in sensory symptoms (96.5%), motor symptoms (56.1%) and bladder symptoms (26.1%) were noted in our study in the immediate post-operative period.

Zhao et al in China conducted a retrospective clinic study found that advantages of operation include thoroughness of debridement, decompression of the spinal cord, and adequate spinal stabilization.²¹ Adequate decompression was noted in 53 (92.9%) of our patients. Sundaram et al at Tamil Nadu, found that single stage posterior

decompression and instrumentation is a safe and effective procedure in the treatment of tuberculous spondylodiscitis with neurological deficit and a kyphotic angle $<60^\circ$.²²

Gupta et al at Jodhpur, found that the posterior approach has better correction of the deformity combined with a decreased blood loss and low morbidity.²³ Patidar et al at Ujjain, Madhya Pradesh, concluded that single-stage posterior-only procedure is safe and effective for management of thoracolumbar spinal TB.²⁴ Mahesh et al conducted a prospective case study over a 2-year period in order to analyze the clinical features, management and outcome of spinal tuberculosis and came to conclusion that careful selection of patients with spinal tuberculosis for surgical management is of outmost importance and no hesitation should be there in debridement and instrumentation. It was found to provide effective relief of symptoms and better quality of life with early mobilisation.²⁵

CONCLUSION

There is significant immediate relief of symptoms in patients undergoing surgical treatment for dorsolumbar spine tuberculosis. Females have better post-operative outcomes in immediate surgical period. Those with preoperative ATT had better bladder symptoms outcome.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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