

various patterns of involvement of Spinal Tuberculosis and To compare the Early intervention Vs Delayed intervention in spinal tuberculosis with respect to improvement in ASIA Score. **Materials and Methods:** All patients with Spinal tuberculosis who underwent intervention in TMCH were studied over duration from Dec 2018 to Dec 2021. Early Presentation and Instrumentation is regarded as one who presents within 4 weeks of symptoms. For all patients ATT was started pre operatively **Result:** 38 patients were included in study, 26 Male, 12 Female, Average Age was 49.8 and Average Age Group was 41-50. Youngest person was 21/F, whereas Oldest 70/M. The most common site of involvement was Thoracic level accounting for 76.32 % (n=29), Most common Symptom being Backache. **Conclusion** Since spinal TB is a disease of the younger population, it is important to conserve neural tissue, prevent spread of infection and prevent associated co-morbidities. With this study, it may thus be concluded that surgical management is effective in treatment of spinal TB when intervention is early along with standard medical management of TB.

KEYWORDS:

INTRODUCTION: Spinal TB occurs in less than 1% of patients with TB1–3, But Spinal TB accountable for 50% of mine infections²³. It continues to be a

Spinal 1B occurs in less than 1% of patients with 1B1–3, But Spinal TB accountable for 50% of spine infections²³. It continues to be a scourge in the developing world, contributing to spinal deformity and neurological deficit.

In Indian set up, spinal tuberculosis is common pathology. Pott's spine corresponds to fifty percent cases of skeletal tuberculosis⁴. Tuberculosis (TB) is a disease of the low socioeconomic group incidence of the disease is found to be increasing in the developed countries, probably due to growing number of immunocompromised individuals⁵

Tuberculosis of the spine is primarily a medical disease and antitubercular treatment (ATT) is the mainstay approach. Surgery was reserved for patients with either mechanical instability or in the presence of neurological deficit.

TB spine usually affects the intervertebral disc and the adjacent vertebral bodies, "paradiscal" area. Involvement of posterior elements is rare. The thoracic spine is most affected followed by the lumbar and cervical spine.

Usual presentation includes chronic back ache, fever, local tenderness, deformity and neurological deficits, sometimes associated with multiple co morbidities. The course is usually chronic, due to the non-specific symptoms there is delay in diagnosis leading to potentially high morbidity and mortality.

Diagnosis is therefore based on clinical suspicion. With advanced imaging techniques such as magnetic resonance imaging (MRI), 6 many cases of spinal TB are diagnosed earlier and are treated before they develop significant neurological deficits.

ATT as per recent NTEP guidelines are the gold standard for the treatment of TB in cases without spinal deformity or neurological impairment and are the first choice of treatment often resulting in fusion in 80% of cases.⁷ The indication for surgery in patients with tuberculosis of the spine are severe spinal deformity, spinal instability, neurological deficits, presence of large tubercular abscess either Para spinal or epidural and failure of response to anti-tubercular drugs.^{89,10}

Blood investigations are of only limited value like fourfold rise in erythrocyte sedimentation rate (ESR) and lymphocyte count. The definitive diagnosis can be made by identification of mycobacterium TB in the biopsy specimen.^{11,12}

MATERIALS AND METHODS

The study design was a retrospective nonrandomized interventional design.

All patients with Spinal tubeculosis who underwent intervention in TMCH were studied over a duration frpm Dec 2018 to Dec 2021.Early Presentation and Instrumentation is regarded as one who presents within 4 weeks of symptoms, in the department of neurosurgery at a tertiary care center in Thanjavur, Tamilnadu, India, over a duration of 2 years (Dec 2018–Dec 2021).

A pre op evaluation done, all patients underwent MRI to diagnose and later ESR, X ray during follow up period. For All patients ATT was started with HRZE as per RNTCP and NTEP 2020

The medical records were retrieved from our old case sheets and records, and the clinical presentation, clinical examination notes, imaging, histopathological report, and follow-up data were analyzed. Cases in which the follow-up period was shorter than 12 months were considered as lost to follow-up and excluded.

Preoperative evaluation

All patients underwent neurological impairment grading according to the American Spinal Association Impairment Scale (ASIA) of motor and sensory impairments ranging from A to E, ranging from no motor and sensory function to normal function:

Grade A-complete loss of motor and sensory function,

Grade B-sensory incomplete,

Grade C – motor incomplete with less than half of key muscle functions below the single neurological level having a Muscle grade > or = 3 (greater than or equal to 3),

Grade D – motor incomplete with at least half (half or more) of key muscle functions below the single neurological level having a muscle grade g3, and

Grade-Enormal motor and sensory function.

ASIA Grades A, B, and C were considered severe.

Procedure

All patients included in the study underwent adequate drainage/debridement of the infected level followed by a stable pedicle screw fixation and interbody bone grafting harvested from the iliac crest or laminectomy bone.

All the procedures were performed by the same surgical team in a single center. Intraoperative samples were sent for cultures, rt-pcr, CB NAAT and Histopathological examination for confirmation of the diagnosis.

The patients underwent surgical intervention based on instability of spine, location of abscess and neurological impairment. In cervical cases all undewent surgery through anterior appproach In thoracic,

thoracolumbar and lumbar cases underwent surgery through posterior approach. All patients abscess / granulation samples sent for Zihel neelsen staining and TB Culture and CBNAAT.

STATISTICALANALYSIS

Data were analysed using SPSS software version 18.0 (SPSS Inc. Released in 2009. PASW Statistics for Windows, Version 18.0. Chicago: SPSS Inc.).

The continuous variables were analysed using descriptive statistics using mean and SD. The categorical variables were analysed using frequency and percentage.

The A to E score of ASIA was converted into Likert scale 1 to 5, respectively, for statistical analysis. Paired t-test was employed for analysis of pre-surgery to post-surgery scores. P-value of ≤ 0.05 was considered statistically significant.

RESULTS

38 patients were included in study, 26 Male, 12 Female, Average Age was 49.8 and Average Age Group was 41-50. Youngest person was 21/F, whereas Oldest 70/M. The most common site of involvement was Thoracic level accounting for 76.32%(n=29). Most common Symptom being Backache.

1. Clinical Presentation

The clinical presentation of the disease among our patients, we noticed aray of symptoms ranging from most common back ache to least common cough and symptoms of active pulmonary tuberculosis



The classical constitutional features of tuberculosis indicating presence of an active disease are malaise, loss of weight and appetite, night sweats, evening rise in temperature, generalized body aches, and fatigue.

Back pain is the most frequent symptom of spinal tuberculosis. The intensity of pain varies from constant mild dull aching to severe disabling. Pain is typically localized to the site of involvement and is most common in the thoracic region.

The pain may be aggravated by spinal motion, coughing, and weight bearing, because of advanced disk disruption and spinal instability, nerve root compression, or pathological fracture. Chronic back pain as the only symptom was observed in 61% of cases of spinal tuberculosis.13, 14.

2. Sex Distrubution

38 Patients were included in study, 26 Male and 12 Female Sex Distrubution



3. Age Group Distrubution

The most susceptible age group was 41-50, and in age less than 20 no cases were found in our study. As the age advances the number of patients decresed



Out of 2000 cases of tuberculous spine, 1080 (54%) were male and 920 (46%) were female. Their age ranged from 8–60 years. About 90% of patients were below the age of 40 years. Peak age among the males and females was 20–29 years and 14–35 years, respectively.¹⁵

4. Number of Vertebral body involved

In our study in most cases two consecutive levels were involved, involvement of three was also seen in some cases.







ESR was elevated in most of cases, and mean ESR elevation was in between 40-60 in 14 cases, ESR was only prognostic indicator and was used in follow up.

6. ASIA Score



ASIA Score was used in our study to see the improvement in compairing the pre op vs post op status, also we differentiated based on our study as less than 4 weeks presentation and intervention within the same.

We found that the patients who presented to us within 4 weeks of initial symptom and being intervened early $\{$ with in 4 weeks of initial symptom $\}$ had an nice improvement of ASIA Score to almost normal from a pre op of 4.3 as converted into likert scale before assessment.

7. Change in ASIA Score After Surgical Intervention : Based on Timing of Presentation

Time of Presentation	Pre Surgery	Post Surgery	Mean Difference	P value
≤4 Weeks	4.1	5	0.9	0.001
>4 Weeks	3.25	3.75	0.5	0.391

8. Change in ASIA Score After Surgery in Patients Who had EpiduralAbscess

Time of Presentation	Pre Surgery	Post Surgery	Mean Difference	P value
≤4Weeks	4.0	5	1	0.001
>4 Weeks	3	3	0	0.01

Only those patients presenting with epidural abscess with neurological deficits, significant improvement in ASIA grade was seen in patients who underwent surgical decompression of abscess within 4 weeks as compared to those patients who presented later. This shows early decompression is beneficial in patients with epidural abscess

Complications

Surgical Complications seen in three patients, all had post operative wound infection, resulting in prolonged hospital stay Good fusion was seen in all the patients by six to eight months

DISCUSSION

- Tuberculosis has a world wide impact and more commonly seen in developing countries with rising MDR trend.¹⁶¹⁷
- Combined treatment is more effective in the management of TB

spine¹⁸, which enables for abscess drainage/debridement of granulation tissue, specimen for histopathology and spinal fusion and deformity correction.

- Surgical management has resulted in early neurological improvement and enabling the early return of patients to routine activity
- However, surgical management of spinal TB has always been controversial, with a few advocating surgical management, versus others claiming no additional benefits with surgical management¹
- It is generally accepted that all foreign materials may decrease the effectiveness of the antibiotics. They facilitate biofilm formation and bacterial adherence, a condition not readily recognizable for the immune system, and hampering the penetration of antibiotics²⁰.
- Oga et al²¹. Reported that M. tuberculosis has low adhesion capability and forms only a few micro colonies surrounded by a biofilm. And the use of titanium implants also prevents the biofilm formation, and decrease bacterial adherence.
- The main observation of this study was the time of presentation and treatment - "sooner the best"
- Posterior approach surgery not only reduces bleeding, but also shortens operation time and length of stay²²
- Posterior approach can directly relieve spinal stenosis and nerve root compression, both spinal decompression and internal fixation can be done at the same time so patient compliance is better²¹
- Some authors prefer anterior approach as they feel better decompression and larger surface area for graft placement post debridement.2

Conclusion

- Since spinal TB is a disease of the younger population, it is important to conserve neural tissue, prevent spread of infection and prevent associated co-morbidities.
- With this study, it may thus be concluded that surgical management is effective in treatment of spinal TB when intervention is early along with standard medical management of TB
- Posterior approach can offer adequate decompression and internal fixation as a single stage procedure with good post-operative fusion rates

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