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## **Outcome in terms of improvement in segmental kyphosis in patients with thoraco-lumber spinal tuberculosis medicated with combination of radical debridement, cage fixation and grafting of bones**

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**Abstract**--Introduction: One of the familiar Pulmonary tuberculosis includes TB spine especially in developing countries [1].Extra-pulmonary tuberculosis approximately involves 14% of patients, with 1% to 8 % having osseous diseases of which 30% to 50% have spinal involvement. The results of this study will direct policy makers of health management system to conceive significant involvement at clinical as well as community level. Objective: To determine the outcome in terms of improvement in segmental kyphosis in patients with thoraco-lumber spine TB medicated with combination of debridement (radical), cage fixation and grafting bones. Material and Methods: 73 patients were taken as total sample. Researchers had taken detailed history of patients and then clinically examined. All

patients in whom clinical suspicion of spinal tuberculosis found was subjected to spinal cord and vertebral imaging, CT scan X-rays as well as MRI spine. Radiographs were reported by consultant radiologist. Results: 48 years was mean age of patients. Among them 65% patients were male and female patients were 35%. Furthermore segmental kyphosis has been improved in 93% victims and has not been improved in 7% victims with thoraco-lumber spinal TB spine managed with combination of cage fixation, radical debridement and grafting of bones. Conclusion: Our study concludes that 95% improvement in segmental kyphosis was found in patients with thoraco-lumber TB spine managed with combination of, cage fixation, grafting of bones as well as radical debridement.

**Keywords**--outcome, segmental kyphosis, thoraco-lumber, TB spine (spinal tuberculosis), radical debridement, cage fixation, grafting of bones.

## Introduction

One of the familiar pulmonary tuberculosis includes spine TB especially in developing countries [1]. Extra-pulmonary tuberculosis approximately involves 14% of patients, with 1% to 8 % having osseous diseases of which 30% to 50% have spinal involvement [2]. TB is the main cause of death all around the world according to the WHO in 2015. [3]. Traditionally Spinal tuberculosis has been treated with combination chemotherapy. Different treatment modalities have been devised in literature for managing different patients. Nevertheless, surgery is specified in sufferers who have back aching problems as well as neurological disorders. The first operation attempts to treat the spinal tuberculosis were practiced in 1970's, laminectomy and abscess drainage to treat paraplegia, but resulted in poor outcomes probably because of absence of effective chemotherapy. Surgical treatment of thoraco-lumber spinal tuberculosis by radical debridement, bone grafting and fixation along with chemotherapy resulted in pain improvement, deformity correction and bony fusion 92% to 100% [4].

Segmental kyphosis is common and a silent presenting feature in patient with tuberculosis of spine due to collapse of involved vertebrae. The deformity is visible clinically over back of patient and is termed as Gibbus. Literature shows segmental kyphosis significantly increases morbidity in spine tuberculosis and makes patient prone to bed ridden life due to progressive neurologic dysfunction due to cord compression [5]. Currently accepted treatment for spine tuberculosis including radical debridement, bone grafting and fixation along with anti-tuberculous therapy significantly increases morbidity in spine tuberculosis and makes patient prone to bed ridden life due to progressive neurologic dysfunction due to cord compression [5]. Currently accepted treatment for spine tuberculosis including radical debridement, bone grafting and fixation along with anti-tuberculous therapy significantly improve segmental kyphosis in 95% of patients immediately post operatively upto a minimum of 10 degrees and other parameters like back pain and bony fusion in long term[6]

Tuberculosis related to spine is a problem for patients as well as their families and major issue for the society. Early diagnosis of spinal tuberculosis accomplished by CT scanning and MRI [8]. The purpose of the study is to treat the spine TB in order to get rid of the disease [9]. Combination of effective anti-tuberculosis chemotherapy and active surgical treatment by radical debridement, cage fixation and bone grafting have been used and can practically lessen the treatment duration, encourage treatment of spine TB also lessen the rate of disease and death in population and made the standard of life better. The aim of this work is to assess spine TB outcomes on clinical level in terms of improvement in segmental kyphosis. Improvement in segmental kyphosis leads directly to correction of spinal deformity which is one of the goals for surgical treatment of spine tuberculosis. The results of this study would be helpful for health care providers to address and manage all aspects of such patients more efficiently. The results will also direct policy makers of health management system to conceive significant involvement at clinical as well as community level.

### **Objective**

To determine the outcome in terms of improvement in segmental kyphosis in patients with thoracolumbar Spinal tuberculosis cured with combination of radical debridement, cage fixation and grafting of bones.

### **Material and Methods**

#### **Inclusion criteria**

Age 15-70 years. All patients of both genders diagnosed with lumbosacral tuberculosis and had not previously received anti-TB therapy Patients with severe back or developing neurological deficit according Frankel grading system. Patient with significant kyphosis ( $>10^\circ$ ) evident on lateral dorsolumbar radiograph.

#### **Exclusion criteria**

All patients who have their neurological pathology leading to paraplegia and bladder and bowel dysfunctions evident on clinical examination. All patients who have history of trauma to spinal cord and vertebral fracture being the cause of neurological deficits and instability evident from medical record and clinical examination.

All patients suffering from thoraco lumbar spine TB were included in study. Detailed history was taken. Then examination on clinical level was undertaken. Radiograph was reported by radiologist. All informations including name, gender, age etc has been noted in proforma. Templates were drawn on preoperative lateral radiograph showing the involved vertebrae. The lower end plate of lower vertebrae and upper end plate of upper vertebra. Data was analyzed using SPSS version 17. Chi square test has been applied.

## Results

Among 73 patients, age distribution was observed a in a way that 23 (32%) patients were in age of 15 to 30 years, 33(45%) victims were in age of 31 to 50 years. 17(23%) were in age of 51 to 70 years. 48 years is the mean age with S.D  $\pm$  12.26 as discussed in table no 1. Distribution of gender was observed as 26(35%) patients were female and 47(65%) patients were male as shown in table no.2. Pre operative segmental kyphosis among 73 patients was analyzed as 62(85%) patients had 20 degree segmental kyphosis. (as shown in Table No 3) Improvement in segmental kyphosis among 73 patients was analyzed as segmental kyphosis was improved in 68(93%) patients, and was not improved in 5(7%) patients. (as shown in Table No 4) Stratification of Improvement in segmental kyphosis with respect to age, gender and Pre operative segmental kyphosis is given in table no 5,6,7.

Table 1  
Distribution of age

(n=73)

Age	Frequency	percentage
15-30 years	23	32%
31-50 years	33	45%
51-70years	17	23%
Total	73	100%

Table 2  
Gender Distribution

(n=73)

Female	26	35%
male	47	65%
total	73	100%

Table 3  
Pre operative segmental kyphosis

SEGMENTAL KYPHOSIS	Frequency	Percentage
$\leq$ 20 degree	62	85%
>20 degree	11	15%
Total	73	100%

Improvement	Frequency	Percentage
Yes	68	93%
No	5	7%
Total	73	100%

Table 5  
Stratification of improvement in segmental kyphosis W.R.T age distribution

Improvement	15 to 30 years	31-50 years	51-70 years	Total
Yes	21	31	16	68
No	2	2	1	5
Total	23	33	17	73

Table 6  
Stratification of improvement in segmental kyphosis W.R.T gender distribution

Improvement	Male	Female	Total
Yes	44	24	68
No	3	2	5
Total	47	26	73

Table 7  
Stratification of improvement in segmental kyphosis W.R.T pre operative segmental kyphosis

Improvement	≤ 20 degree	>20 degree	Total
Yes	58	10	68
No	4	1	5
Total	62	11	73

## Discussion

Spinal tuberculosis is considered extra pulmonary tuberculosis especially in developing countries. Extra-pulmonary tuberculosis approximately involves 14% of patients, with 1% to 8 % having osseous diseases of which 30% to 50% have spinal involvement. Total patients were 73. Mean age was 48.35% victims were female. 65% victims were male. Segmental kyphosis was not improved in 7% sufferer while it was improved in 93% sufferers. Another study has shown the result in which accepted treatment for spine tuberculosis including radical debridement, bone grafting and fixation along with anti-tuberculous therapy significantly improve segmental kyphosis in 95% of patients immediately post operatively up to a minimum of 10 degrees and other parameters like back pain and bony fusion in long term. Another study had reported that mean age of the patients was 45 years  $\pm$  10.11. 30% victims were female while 70% victims were male. They have observed that 89% patients had shown improvement in segmental kyphosis in patients presenting with thoraco-lumber spinal tuberculosis and had the treatment of radical debridement and cage fixation and bone grafting. From another study, vertebrae have paradiscal region which are effected in 98% of spine TB lesion. Slowly, the disease effects end plates of vertebral which becomes weak structurally which can be seen on x rays. As a result, the vertebral body loses its height than posterior. Thoracic kyphosis increases and slowly angular kyphosis become visible.

## Conclusion

Our study concludes that 95% improvement in segmental kyphosis was found in patients with thoracolumbar spinal TB treated with radical debridement, cage fixation and grafting of bone.

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