

A STUDY OF 34 CASES OF POTT'S PARAPLEGIA WITH ANTERIOR SPINAL DECOMPRESSION & STABILISATION WITH RIB GRAFT ALONEV. S. Ravindranath¹, V. K. V. Prasad², B. Srinivas³**HOW TO CITE THIS ARTICLE:**

V. S. Ravindranath, V. K. V. Prasad, B. Srinivas. "A Study of 34 Cases of Pott's Paraplegia with Anterior Spinal Decompression & Stabilisation with Rib Graft Alone". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 22, March 16; Page: 3837-3844, DOI: 10.14260/jemds/2015/552

ABSTRACT: BACKGROUND: Spinal tuberculosis is mostly secondary to either Pulmonary or Abdominal lesions, and may result in Paraplegia either due to pressure effects of the cold abscess or due to collapse of the vertebra. Most of the patients with Grade I and II paraparesis respond well to chemotherapy, while Grade III and IV patients and some of the patients in Grade I and II who do not respond to chemotherapy need Spinal decompression to prevent irreparable damage to the Spinal cord. **MATERIALS AND METHODS:** This study comprises 34 patients in Grade III and IV paraplegia who did not respond to 3-4 weeks of chemotherapy and rest or deteriorated during treatment. They were treated by anterior trans-thoracic and trans-pleural spinal decompression by partial or total corpectomy depending on the extent of involvement of the bodies and anterior spinal fusion using rib graft alone, during the period Feb. 2007 to May 2013, in Government General and Chest hospital, Osmania Medical College, Hyderabad. **RESULTS:** Out of 34 patients complete neurological recovery was seen in 32 patients, 1 patient had partial recovery while 1 patient died of post-operative complications. **CONCLUSIONS:** Anterior spinal decompression and stabilization using rib graft alone is a good choice of surgical treatment in terms of neurological recovery, healing of the lesion, and is a cost-effective treatment option for the patient. Post-operative rehabilitation is also early.

KEYWORDS: Pott's paraplegia, anterior decompression, Rib graft.

INTRODUCTION: This entity was first described by Percival Pott in 1782. The management of spinal tuberculosis has evolved through various eras of management, from drugs alone, radical surgery combined with drugs, to the current era of drug treatment in majority of patients with surgery limited to those with specific indications.

According to WHO 1/3 of world population is infected with Tuberculosis. One fifth of TB population is in India. Skeletal Tuberculosis contributes 3% of total cases. Vertebral tuberculosis is the most common type of skeletal tuberculosis. (Fig 1, & 2)

Males and females are equally effected. Neurological complications are most crippling complications of spinal tuberculosis (incidence 20 %).

Pott's disease is usually secondary to an extra-spinal source of infection. Most of the times the primary site may be lung, visceral or glandular. It is due to Heamatogenous spread. The area affected usually is the anterior aspect of the vertebral body adjacent to the sub-chondral plate. The contiguous vertebrae are involved usually but rarely skip lesions are encountered (fig 4).

MATERIALS AND METHODS: This study is conducted at Govt. gen. & chest hospital, Hyderabad b/w the period of February 2007-may2013. This study includes 34 cases of pott's paraplegia treated with anterior trans-thoracic trans-pleural approach to the spine with complete or partial corpectomy with rib graft.

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This study includes 34 cases of pott's paraplegia treated with anterior trans-thoracic, trans-pleural approach to the spine with complete or partial corpectomy with rib graft.

Out of 34 cases, 16 patients are males, 18 patients are females. Most of the patients are below 40 yrs. age group. A case of spinal tuberculosis is diagnosed based upon clinical features, laboratory investigations, plain radiograph, MRI.

CT GUIDED BIOPSY of the vertebral body is done in two cases to confirm the diagnosis, MRI is done for all the cases for early diagnosis. Pre-operative evaluation is done for all the patients.

INCLUSION CRITERIA FOR ANT SPINAL DECOMPRESSION:

1. Grade 3 and grade 4 paraplegia (Table 1).
2. No sign of Neurological recovery after trial of 3-4 weeks therapy.
3. Neurological complication during treatment.
4. Neurological deficit becoming worse.
5. Recurrence of neurological complication.
6. Pre-vertebral cervical abscesses causing difficulty in deglutition & respiration (Fig 3).
7. Advanced cases with Sphincter involvement, flaccid paralysis, and severe flexor spasms.

EXCLUSION CRITERIA:

1. Patients without neurological deficit.
2. GRADE I & II paraparesis which can be managed conservatively, are excluded from this study.
3. Patient medically unfit for surgery.

Surgical Procedure: Under General anaesthesia, Thoracotomy is done right lateral position where it is easier to handle Aorta on left side than Inferior vena -cava on right side.

Incision: It is along the inter-costal space, the incision in mid axillary line lies opposite to centre of the lesion, muscle and periosteum stripped from the rib, inter-costal neurovascular bundle lies on inferior margin of the rib, avoid injury to it. Rib is resected sub-periosteally (Pic 1), incision given over parietal pleura. One lung ventilation helps in making the lung free from parities as completely as possible. Adhesions are released by blunt dissection and cauterised carefully. A plane is developed between aorta and vertebral body. Intercostal vessels & branches of Hemi-azygous vein opposite to diseased vertebra are ligated and cut. The Aorta is mobilized forward and expose the diseased vertebrae followed by complete debridement.

Complete Debridement –Defined as clearing of all the damage and disease including psoas abscess granuloma, involved inter-vertebral disc, bony sequestrum, inflammatory granulation tissue (Pic 2). Single or double rib strut graft is kept by making slots above & below the vertebra (Pic 3). Wound closed in layers, over a drain.

Post- Operative Management: ATT started on 1st Post-Operative Day. All the patients are given bed rest for 8weeks with frequent changing of posture.

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Neurological examination is done. Plain radiograph is taken two months after the surgery (Table 2).

Patient is mobilised with help of TAYLOR'S BRACE 3 months after the surgery.

Patient is reviewed at 6, 12, 15, 18, 24 months. MRI is taken at 6, 12, 18 months post op. ATT continued for 18 months post operatively, 4 drug regime for 4 months which includes HRZE (INH, Rifampicin, Pyrazinamide and Ethambutol). 3 drug regime for 14 months which includes HRE (INH, Rifampicin, Ethambutol).

RESULTS: This study was conducted between February 2007 to May 2013 at Government General and Chest Hospital, Hyderabad, with an average follow up of 3.5 yrs. (5.5 yrs-- 1.5 yrs.). Out of 34 Patients 16 Are Male and 18 Are Female (Graph 1) Age incidence: Most of the patients are between 20-40 years of age. (Graph 2) Most commonly involved region of dorsal spine is D6-D7, followed by D9-D10 (Graph 3) Average operative time was 2 hrs. Average blood loss of 500ml. No intra operative complications are observed. 1 patient developed drug reaction (Nausea, skin rash, abdominal discomfort) but did not warrant stoppage of ATT. out of 34 patients with paraplegia complete neurological recovery is seen in 32 patients. In this study Partial recovery is seen in 1 patient. Post-operatively one patient developed respiratory embarrassment and was put on ventilator but unfortunately patient succumbed.

Results of the study are followed as:

Excellent result: Complete resolution of disease with DOTS regimen for 18 months, with no residual disability or deformity with solid bony union.

Good result: Complete resolution of disease with DOTS regimen for 18 months with no residual disability or deformity and with the occurrence of medically manageable mild pain, however not limiting physical activity with no neurological deficit.

Fair result: Complete resolution of disease, but with a post treatment kyphosis deformity of 30 degrees or more at the affected level, with partial neurological recovery, or patients who are having moderate residual pain limiting their physical activity.

Poor result: Failure to achieve bony union or no neurological improvement or death due to complications.

Out of 34 patients, 32 patients showed excellent results, one patient showed fair result.

One patient showed poor result (Graph 4).

DISCUSSION: Radical debridement and decompression remains the standard surgical procedure for removal of disease which needs additional structural support using rib graft. Rib graft is used as auto graft after spinal decompression as a strut. Successful incorporation of strut graft allowed early axial loading and mobilization of the patient. The autogenous rib graft also helps in enhancing osteo-genic potential. Frequently, the spinal tuberculosis often involves 2 or more number of vertebral bodies in dorsal and dorso-lumbar region. However, involvement and destruction of 3 or more vertebral bodies needs more rigid and stable fixation. Autogenous iliac crests and fibular strut grafts can be used in patients who require most stable fixation.

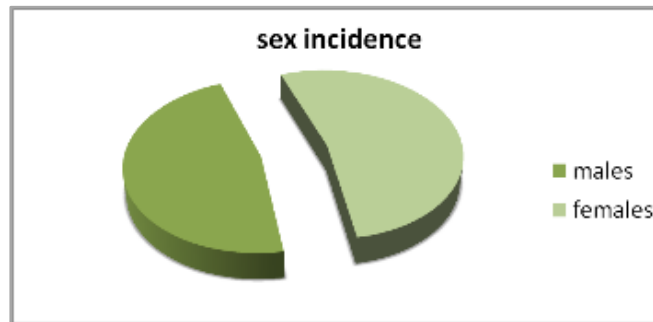
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Study done by S. Govender et al., by using allogenic bone grafts for stabilization of anterior column showed similar results, all the patients achieved complete neurological recovery and significant bony union.

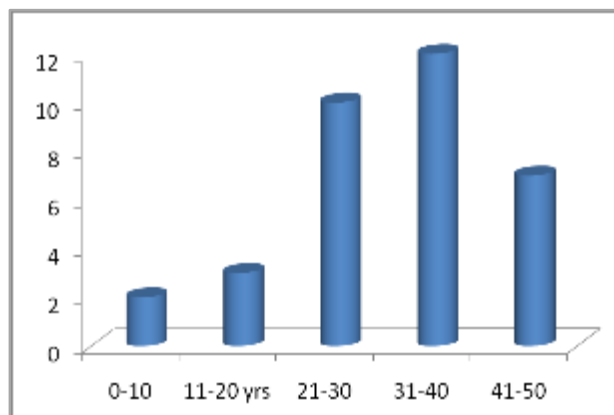
Most common cause of paraplegia in tuberculous spine is inflammatory edema of the cord, followed by mechanical compression due to tuberculous granulation tissue. Intra operatively it was observed that clearance of granulation tissue relieved mechanical pressure on cord and post operatively helped in neurological recovery.

The earlier the initiation of the treatment, the better is the result. If the treatment is started during the pre -destructive or early destructive stages, the results are excellent or good, however, in the later stages of kyphosis with involvement of more vertebrae, the results start becoming fair or poor. The destroyed tissues can never attain the pre-disease level this explains the better results in those patients treated in the early stages of the disease.

CONCLUSION: Anterior spinal decompression and fusion using rib graft for tuberculosis of the spine was highly successful in producing significant neurological recovery, and Solid bony fusion. Good clinical outcomes as well as improvement of neurological functions are achieved. Graft slippage is not a problem with autologous rib graft if properly inserted. But correction of kyphotic deformity in two or more vertebrae disease was not satisfactory and requires larger bone grafts and instrumental fixation.

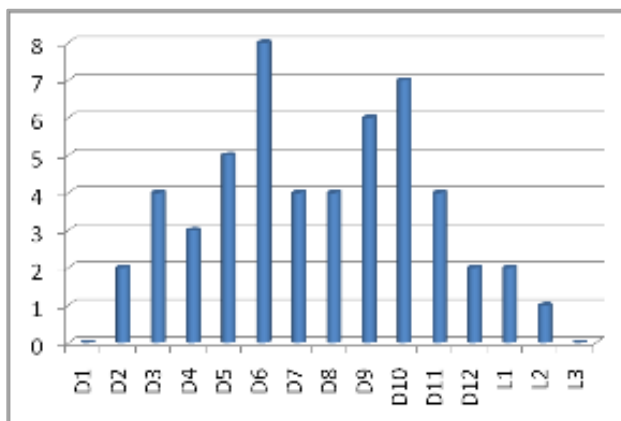


Graph 1

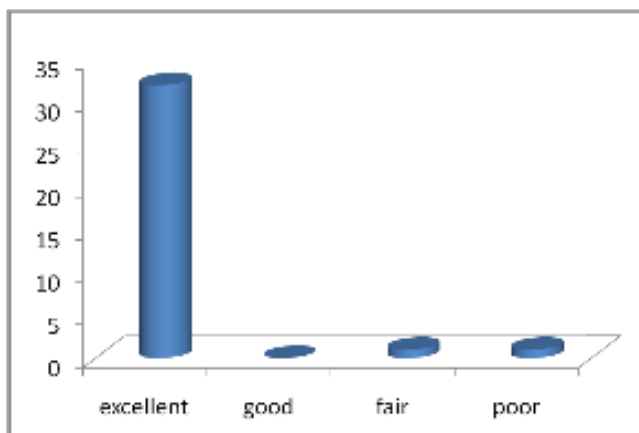


Graph 2

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Graph 3



Graph 4

INTRA-OPERATIVE PICTURES:

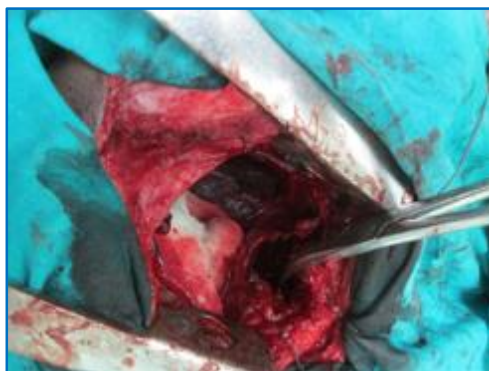


Fig. 1



Fig. 2

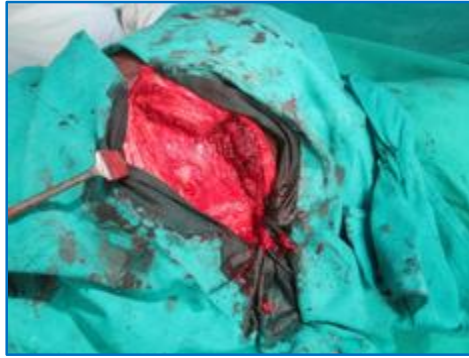


Fig. 3

Grade		Clinical features
1	NEGLIGIBLE	Unaware of neural deficit, Plantar extensor/ Ankle clonus
2	MILD	Walk with support
3	MODERATE	Non-ambulatory, Paralysis in extention, sensory loss <50%
4	SEVERE	3+ paralysis in flexion/sensory loss>50%/ Sphincters involved

Table 1 : Kumar's classification of Tuberculous paraplegia

Stage		Features	Usual duration
1	Pre-destructive	Straightening, spasm, hyperemia in scinti	<3 mo
2	Early-destructive	Diminished space paradiscal erosion Knuckle <10	2-4 mo
3	Mild kyphos	2-3 verte k:10-30	3-9 mo
4	Moderate kyphos	>3 verte K:30-60	6-24 mo
	Severe kyphos	>3 verte K:>60	>2 years

Table 2 : Kumar's Clinico Radiological Classification

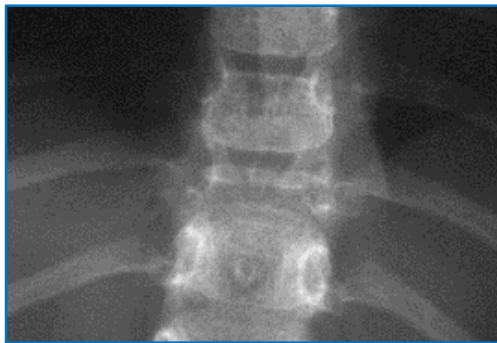


Fig.1: Collapse of vertebral body with Sparing of the disc space



Fig.2: Anterior wedging of the bodies with pre vertebral abscess



Fig. 3: Huge Fusiform Para-spinal abscess



Fig. 4: MRI showing skipped lesion

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