
Review of 50 Cases of Fracture Thoracolumbar Spine Treated with Pedicular Screw Fixation

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Abstract:

50 Patients of thoracolumbar fracture underwent pedicular screw fixation by the above authors. All were inherently unstable fractures with varying neurological deficit. The advantage of pedicular screw fixation was studied.

Key Words: Thoracolumbar fractures, Pedicular screw fixation.

Introduction:

Thoracolumbar fractures are grievous injuries and can cause permanent morbidity. Earlier conservative care was advocated,³ but fractures which are unstable are better treated with internal fixation to provide faster mobilisation and easy nursing care. Simple compression fractures with more than 50% loss of vertebral body height are also potentially unstable¹² and were fixed internally. The beneficial effects of pedicular screw to provide biomechanical support for short segment fixation and preserve adjacent motion segments is documented in the literature.^{9,10,7} Pedicular screws are also used for non traumatic indications.^{1,13} Instrumentation provides better fusion rate compared to non instrumentation fusion.⁴

Materials, Methods and Patients:

A total of 50 cases of thoracolumbar fractures underwent pedicular screw fixation by the two authors using MOSS MIAMI pedicular screw system. All patients with inherently unstable fractures¹¹ were fixed irrespective of the neurological status. All patients were subjected to preoperative assessment of medical status, neurological charting and roentgenograms, CT scan, MRI and scan. Evaluation of pre-operative, postoperative post-op and follow up roentgenograms was done for vertebral body height restoration, status of fusion and any kyphotic deformity, implant failures. Laminectomy was done in patients with neurodeficit and retropulsed fragments were punched back in to place. Facetal fusion was done using autologous bone grafts.

Operative Technique:

The prone position was used. A midline posterior approach to the dorsolumbar spine was made. All patients with documented neurodeficits underwent prior decompressive laminectomy and retropulsed fragments were punched back in to place.

Dessicated and exuded diskal matter was excised. Short segment fixation with MOSS MIAMI pedicular system was carried out and contoured rods were attached and distraction performed to achieve reduction. Facet joints were decorticated as also the lamina (in neurologically stable patients) and spinous process and iliac bone grafts were placed to achieve fusion. Pedicular screw placement was done under image intensifier using the standard procedure described by Roy Camille.¹⁰ The wound was irrigated with gentamicin saline, a gel foam was placed on the exposed cord, then the wound was closed in layers over a closed suction drain (Fig. 1).

Post Operative Care:

The drain was removed after 24-48 hrs. Side turning was allowed after 4 days. Patients were allowed to stand up with Anterior Hyperextension Brace after 10 days of surgery. The Arteria Hyperextension Brace was continued for 6-12 months depending on the fracture stability. Serial x-rays were taken at follow up to document fracture healing and detect complications (Fig. 2).

Results:

A total of 50 cases were evaluated. Of these 47 were males and 3 females. Majority of the patients were in the age group of 20-30yrs. Fourth-five males and two females suffered road traffic accidents and two males and one female suffered fall from height. In 26 patients there was polytrauma with concurrent skeletal injuries. A male who fell from height sustained bilateral calcaneum fracture as well. The majority of the fractures were in the dorsolumbar junction and thoracic spine (n=36). Lumbar fractures were present in 14 cases. The average duration of stay in hospital was around 3 weeks. Neurological deficits were present in 38 patients (76%). Out of these 38

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patients, 17 patients (44.7%) recovered complete motor and sensory function. Of the remaining 21 patients, 16 patients (76.2%) had significant improvement with some residual loss. Of the remaining 5 patients, 4 patients (8%) showed no improvement. One patient (2%) had worsening of neurodeficit and ultimately died presumably due to anaesthetic complications. In 2 patients (4%) fusion

was unsatisfactory and they had persistent backache. Out of the remaining patients only 6 patients (12.5%) complained of mild discomfort in the back. There was no occurrence of infection, kyphosis or broken implant. Overall, 45 patients (90%) returned to near normal prehospitalization work status.

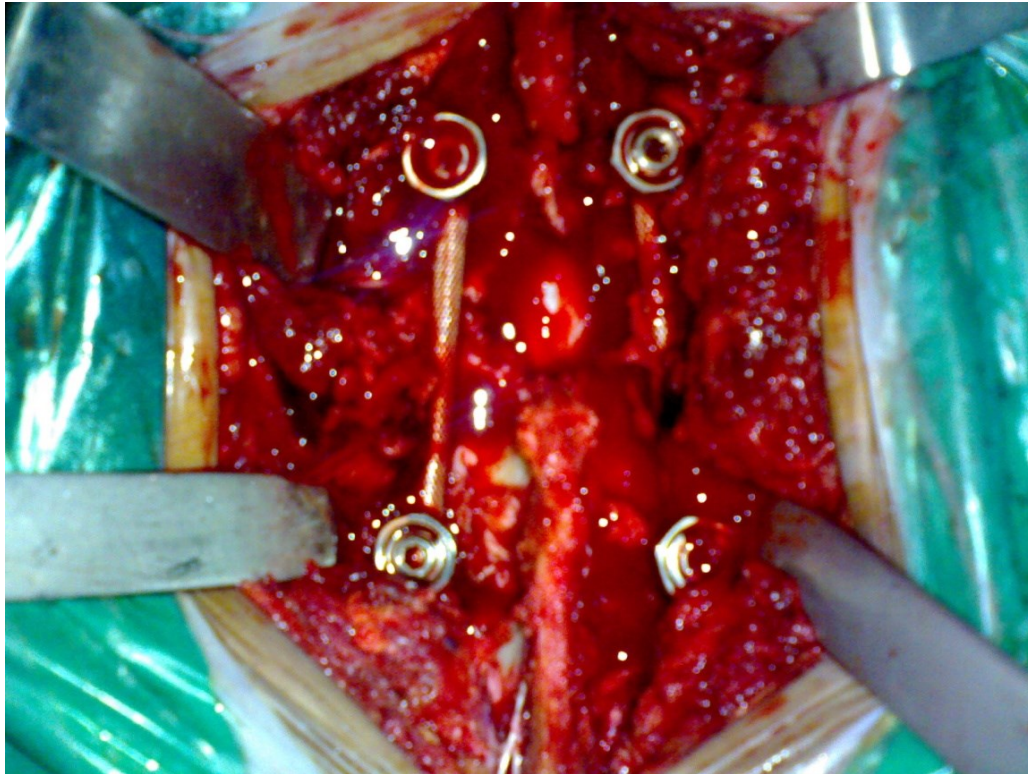


Fig. 1: Intraoperative photograph showing pedicular screws

TABLE Age Distribution

Age in yrs	10-20	21-30	31-40	41-50	51-60
No of cases	2	36	8	3	1

Discussion:

In our series 50 patients of thoracolumbar fractures were evaluated .All patients were treated with MOSS MIAMI pedicular system. All operations were performed by the authors on an alternate basis. Males were predominant probably because they represent the working and movable population. Dorsolumbar area is the most mobile segment of the spine and majority of our cases were in this area. Zero percent infection rate in our series may be attributed to strict aseptic precautions and antibiotic regime and gentle tissue handling. This is comparable with other reported series in the literature.¹¹ Pedicular screw fixation is probably the

most biomechanically strong fixation for spinal fractures,^{10,6} hence it is the mainstay of thoracolumbar fixation today.⁵ Pedicular screws preserve adjacent motion segments and thereby help in maintaining spinal mobility.⁷ Despite several advantages , certain pitfalls are worth mentioning. Pedicular screw insertion is easier in the lumbar spine as compared to thoracic spine. The technique entails a steep learning curve and requires a thorough knowledge of the pedicle anatomy and radiographic control,^{2,8} Risk of complications endangering nerve root, dural sac, and pedicle fracture are present.



Fig. 2: Post operative X ray of pedicular screws

Conclusions:

Ours was a small series of 50 cases. The overall good results may be attributed to good surgical technique, early operation and good instrumentation. One death in our series did occur, probably due to anaesthetic complications inherent in all major surgeries. The patient was around 59 yrs old and had an episode of intraoperative

hypotension due to the toxic effects of anaesthetic gases and in all probability suffered ischemic damage to the cord and myocardium. We do not wish to draw any concrete conclusions as the study was limited to only 50 cases, but it certainly highlights the benefits of pedicular screw fixation.

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