

Radiological and Clinical Outcome of Thoracolumbar Burst Fracture Following Short Segment and Long Segment Pedicle Screw Fixation

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ABSTRACT

INTRODUCTION: The indications for operative treatment and type of stabilization procedures for the treatment of thoracolumbar fracture remains controversial. Long-segment pedicle screw fixation permits correction of kyphotic deformity while short-segment pedicle screw fixation preserves motion segments, reduces costs and time of surgery. Our aim is to study the correlation and comparison between clinical and radiological outcome of both fixations and identify factors that might contribute to the outcome. **MATERIALS AND METHODS:** 60 patients with thoracolumbar spine fracture from 2017 to 2022 were identified. Age, gender, mechanism of injury, classification of fracture, duration of hospital stays and one-year post-operative outcome of Visual Analogue (VAS) pain score, and Oswestry Disability Index (ODI) score were documented. Pre- and post-operative AP/Lateral radiographs measurements of local kyphotic angle, Cobb angle were measured. Signs of fixation failure were examined at follow-up. **RESULTS:** Subjects mean age is 42.4, male predominance (85%) and work-related. The highest incidence was at level of L1 (56.7 %) in the long-segment and 46.7 % in short-segment. Most common injury was burst fracture (AO classification A3 A4 group) due to fall from height. There is shorter hospital stay documented in the short-segment fixation. Radiological outcome measured in both groups were comparable with no signs of fixation failure. Short-segment fixation group also resulted in better clinical and functional outcome at one-year follow-up. **CONCLUSION:** There is no significant difference in radiologic outcome of Cobb and kyphotic angle in both fixation groups. Short-segment fixation has significantly better clinical and functional outcome post-operative and at 1-year follow up.

Keywords

Thoracolumbar fracture, Short-segment fixation, Intermediate screw

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INTRODUCTION

Thoracolumbar area is commonly affected in spine fractures, representing about 90% of all vertebral fractures.¹ The region between (T10 to L2) is prone to injury because of stress concentration at this transitional zone, between mobile lumbar spine and the stiffer thoracic spine.^{1,2} General consensus on the best approach to treat thoracolumbar burst fracture is absent.² Fixation of thoracolumbar burst fracture can be done through an anterior surgery, posterior surgery, or a combination of anterior and posterior surgery. Many studies reported better functional results including less pain, less surgical blood loss and early return to work in patient treated with posterior only surgery.³ A combined approach has better

correction of sagittal deformity, but has significant operative morbidity with longer surgery time, more blood loss and more tissue damage.

Initial report in 1993 revealed higher rate of implant related complications when short segment fixation (SSF) is used for thoracolumbar burst fracture suggests that posterior fixation alone may not be sufficient when Cotrel Dubousset instrumentation was used for SSF.⁴ However, University of Missouri Medical Centre reported successful treatment with SSF and post operative spinal bracing for less comminuted fractures.⁵ Long segment fixation (LSF) provides superior results in term of radiological outcome