



Percutaneous Pedicle Screw Fixation for the Treatment of Traumatic Thoracolumbar Spine Injuries

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Introduction

Minimally invasive spinal surgery (MIS) has been increasingly utilized for the treatment of various pathologies. To date, many clinical studies have focused on degenerative pathologies. MIS techniques have several advantages over open techniques including shorter hospitalization, decreased blood loss, tissue manipulation, and postoperative pain, and shorter operative times. Percutaneous pedicle screw (PPS) fixation is one such MIS technique. Indications have been expanding to include deformity and trauma. The authors herein describe the use of PPS fixation in traumatic thoracolumbar fractures in which the long-term stability relies on the healing of the fracture instead of traditional posterolateral fusion.

Learning Objectives

By the conclusion of this session, participants should be able to 1) Describe the importance of minimally invasive spinal techniques, 2) Discuss in small groups the advantages and disadvantages of MIS techniques compared with open techniques, and 3) Identify when MIS techniques may be appropriate to treat traumatic thoracolumbar injuries.

Methods

From December 2008 – February 2014, PPS fixation has been used in 35 cases of traumatic thoracic and lumbar fractures at our institution. These fractures extended from T5-L5. Thirteen patients had flexion - distraction injuries, 11 had burst fractures, 7 had extension fractures, 3 had fracture dislocations, and 1 had a flexion-compression fracture. American Spinal Injury Association (ASIA) scores and degree of kyphosis were recorded at admission, discharge and follow-up.

Results

At mean follow-up of 9+/-8 months, no patients had worsening of neurologic status, and one patient with a burst fracture improved from ASIA D to E. Average hospital stay was 8 +/- 5 days and improvement in kyphosis was from 2.20 to 3.12 degrees. This was not statistically significant ($p>.05$). One patient was taken back to the OR for revision of a pedicle screw and another patient developed spinal infection distant from the surgical site.

Pre-op sagittal CT

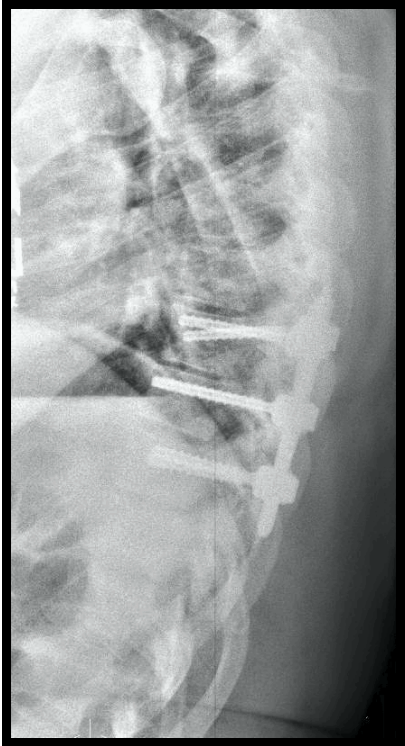


Flexion-distraction injury

Conclusions

PPS fixation is a treatment option in thoracolumbar spine trauma when direct decompression is not necessary, as in flexion-distraction injuries, burst fractures with limited retropulsion, and extension fractures. Here we show good initial results from PPS fixation when dealing with a variety of spine fractures. Long-term follow-up is needed.

Post-op lateral xray



Short segment MIS instrumentation

Post-op AP xrays



Short segment MIS instrumentation

References

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3. Percutaneous pedicle screw fixation through the pedicle of fractured vertebra in the treatment of type A thoracolumbar fractures using Sextant system: an analysis of 38 cases. Wang H, et al. Chin J of Traumatology. 2010;13(3):137-45.