



Direct Midline Posterior Corpectomy and Fusion of a Lumbar Burst Fracture with Retrospondyloptosis:

Technical Note

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Introduction

The authors describe a direct midline posterior lumbar corpectomy technique with circumferential reconstruction and fusion for an L4 burst fracture with retrospondyloptosis of L3 and L4 over L5 in a patient with severe neurological deficit.

Methods

Case Report

Results

A 37 year-old male presented with severe neurological injury including loss of motor function below the level of the iliopsoas muscles bilaterally, saddle anesthesia, and absent rectal tone, following a fall from 60 ft. CT scan revealed an L4 vertebral body comminuted burst fracture with complete posterior translation of L4 over L5 (Fig. 1). Patient was taken to the operating room for an L4 corpectomy and L2-S1 posterior fusion. The L4 vertebral body was visualized posterior to the posterior elements of L5 and resected in a piecemeal fashion. Since the thecal sac had been completely transected, a visible path down the L3-L4 and L4-L5 disk spaces was apparent allowing direct posterior discectomies at these levels, and completion of the L4 segment resection (Fig 2). The use of a direct posterior approach resulted in minimal blood loss, correction of sagittal alignment, and satisfactory outcomes comparable to the standard posterior transpedicular approach. Construct stability and solid bony fusion have been maintained through 4 years postoperatively (Fig 3).

Conclusions

We have described a modified posterior corpectomy in which circumferential reconstruction was performed via a direct posterior approach across the thecal sac. In our case, an anterior approach was contraindicated due to the patients multiple abdominal injuries, and a lateral approach would not have allowed for significant correction of his high degree of sagittal deformity without risking an injury to his great vessels. Furthermore, a lateral approach posed a significant risk of damaging his lumbar plexus and possible loss of his remaining iliopsoas function. The use of a direct midline posterior corpectomy approach may be considered for patients with lumbar burst fractures, high grade neurological injury, and transection of the thecal sac.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Understand the surgical technique of performing a direct midline posterior corpectomy and fusion of a lumbar burst fracture with retrospondyloptosis.
- 2) Understand the indications and advantages of the approach.

Figure 1



Fig. 1. Preoperative images. A: Sagittal CT of the lumbar spine indicating L4 burst fracture with posterior dislocation of the vertebral body. Additionally, there is complete retrolisthesis of L3 with respect to L5. B and C: Axial CT depicting severe burst fracture of L4 with dislocation of the vertebral body posterior to the posterior elements of L5.

Figure 2

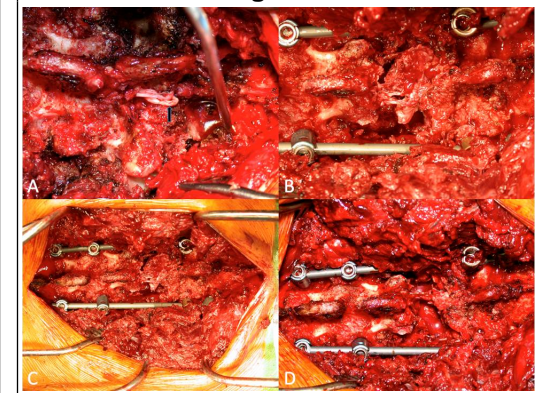


Fig. 2. Intraoperative photographs. A: Gross deformity of the lumbar spine evident on exposure. Severe disruption of the soft tissues and bony architecture, as well as significant damage to the neural elements (arrow). B: Resection of the subluxed L4 vertebral body and its posterior elements exposing the transected thecal sac. C: Pedicle screw fixation restoring alignment of vertebral column with the L4 comminuted burst fracture. D: Postcorpectomy of the L4 vertebral body and adjacent disc spaces via direct posterior approach.

Figure 3

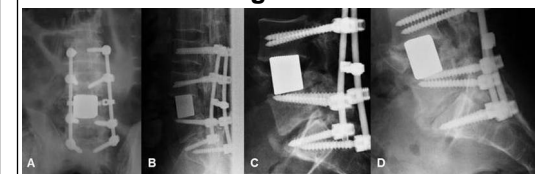


Fig. 3: Postoperative images. A and B: Postoperative lumbar x-rays illustrating L4 interbody and posterior pedicle screws fixation. C: Repeat radiographs at 3 months demonstrating stable construct and progressing bony fusion. D: Lumbar radiographs at 4 years postoperatively indicating successful bony fusion.