

Unstable Burst Fracture Managed with XLIF and Posterior Instrumentation: Technical Note



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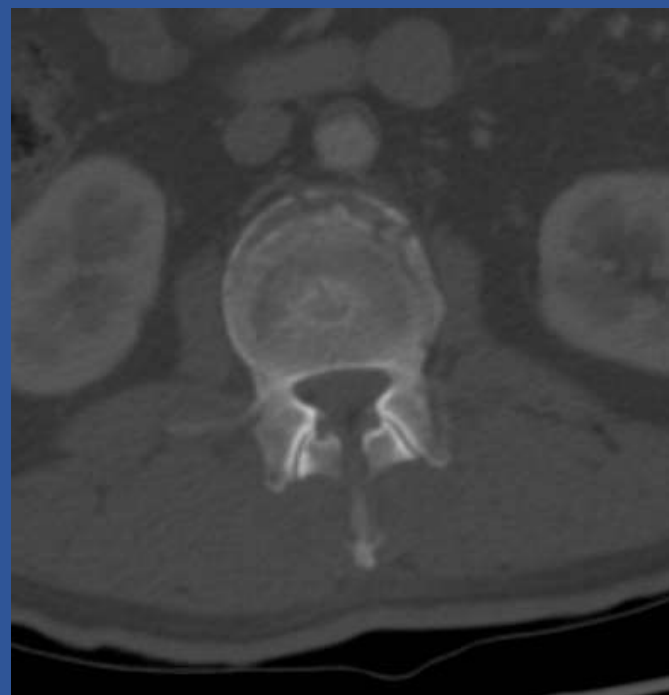
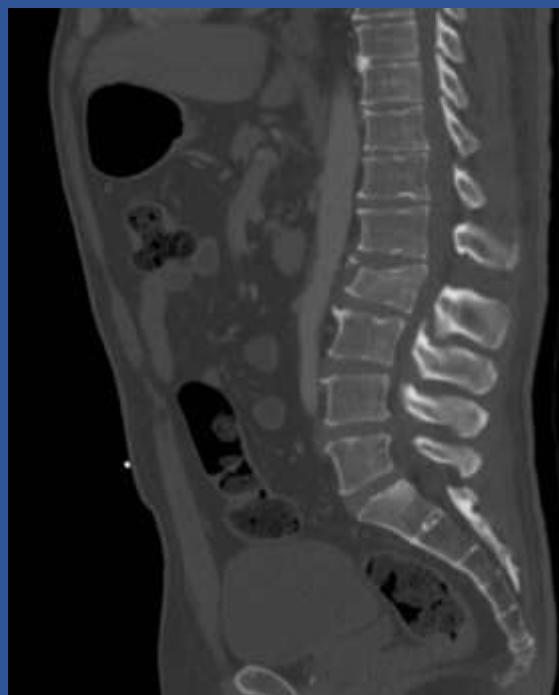
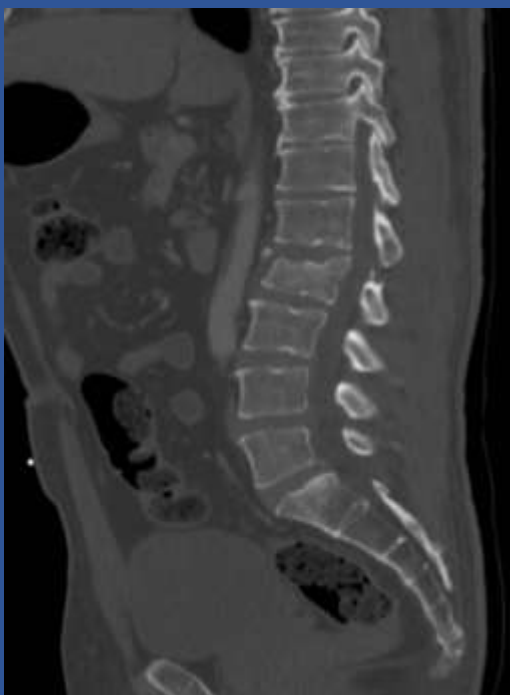
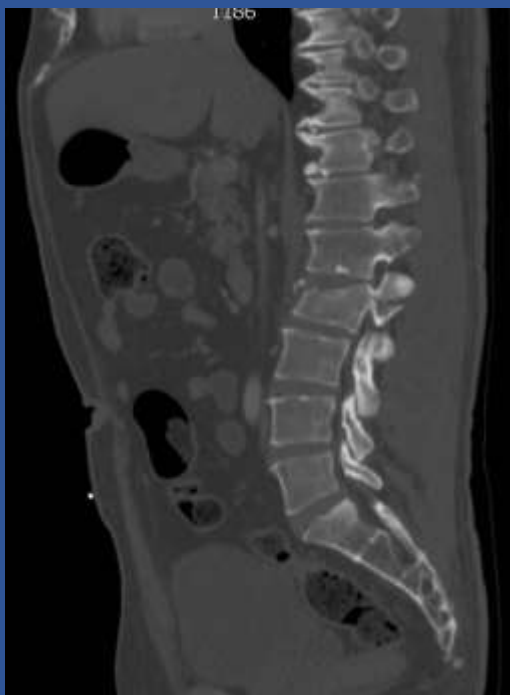
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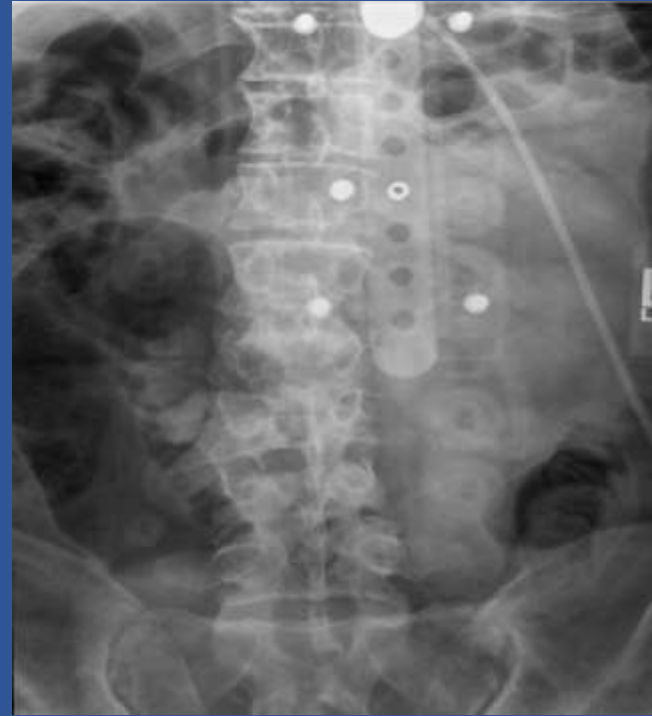
Introduction

- Burst fractures are compression fractures of anterior and middle portions of spinal column¹
- Surgical indications vary based on classification system but accepted that neurologic deficits with radiographic evidence of cord compression or unstable fracture patterns with progressive kyphosis require stabilization
- Standard operative treatment for unstable thoracolumbar burst fractures has been corpectomy using various approaches
- Corpectomy is morbid procedure with high blood loss and fusion of two or more vertebral levels¹⁻⁴
- We propose a novel use of extreme lateral interbody fusion (XLIF) technique for treatment

Case Presentation

- 49M sustained an flexion distraction injury with L2 burst fracture L1-3 transverse process fractures and he was neurologically intact.
- Supine imaging was classified as a Load Sharing 4⁵
- Decision made to obtain upright radiographs in thoracic lumbar sacral orthosis (TLSO) brace
- Upright radiographs demonstrated increased kyphosis to approximately 50 degrees → Recommendation for operative stabilization





Case Presentation

- Underwent minimally invasive L1-L2 XLIF and posterior instrumentation from T12-L3.
- Right lateral decubitus position. 4cm oblique skin incision overlying L1-L2
- Osteotomy of rib with caudal reflection
- Diaphragm reflected off posterior chest and retroperitoneal space connected to retropleural space
- Annulotomy performed after localized correct disc space
- Performed discectomy and sufficient bone stock to support hyperlordotic implant
- Disc space packed with 2 mL of NanOss. The NuVasive 30° hyperlordotic implant was packed with 3 mL of NanOss and 8 mg of BMP and wrapped with Surgicel
- 5.5 mm screw placed into L1 vertebral body through screw tab
- Wound closed and then patient positioned prone. Percutaneous incisions made to place and pass instrumentation from T12-L3.

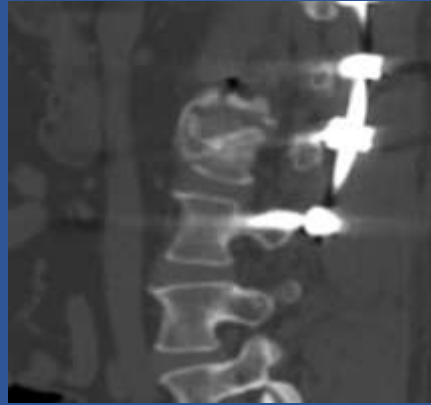
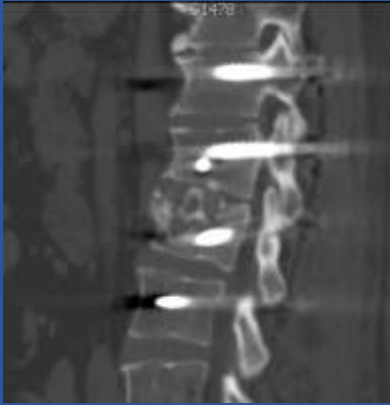
Intraoperative Images



Case Presentation

- Estimated Blood Loss 100 cc. He remained neurologically intact post-operatively and discharged home on POD 3 after ambulating 200 feet.
- He returned to light duty at work as a landscaper at two months post-operatively.
- A CT scan at three months post-operatively demonstrated early bridging bone
- Indicated for hardware removal at levels above and below fusion
- Sagittal alignment remained unchanged. Returned to all activity without limitations at nine months following injury.

Post-operative Imaging



CT Scan at 3 months post-op

Post-op radiographs following instrumentation removal T12 and L3



Upright radiographs 9 months following injury with maintained alignment and fusion

Discussion

- Generally, a corpectomy is necessary to manage unstable burst fractures. For a L2 burst fracture, there would be at least a fusion from L1-L3 and sometimes as many as seven levels are necessary.⁶
 - Approaches include anterior, posterior, combined and mini-open lateral
- XLIF commonly utilized for management of DJD, but not previously described for management of unstable burst fracture
 - No need for access surgeon, operate outside pleura, minimize blood loss
 - Risk of injury to lumbar plexus depending on vertebral level⁷
 - Significant learning curve, but significant reductions in operative time, blood loss, length of hospital stay, faster return to activity

Conclusions

- Lateral interbody fusion via a minimally invasive lateral approach in addition to posterior instrumentation for management of unstable burst fracture is a viable surgical option
- May offer decreased blood loss, earlier mobilization, and quicker return to function
- Further studies necessary to investigate whether or not outcomes seen with XLIF continue to translate to burst fractures managed with similar techniques

Sources

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Questions?

