

Reclaiming Spinal Stability: An In-Depth Look at Pedicle Subtraction Osteotomy for Posttraumatic Thoracolumbar Fracture with Kyphosis

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INTRODUCTION:

Thoracolumbar fracture if not treated correctly prone to kyphosis. Posttraumatic thoracolumbar fracture with kyphosis often causing severe back pain, spinal stenosis, nerve compression and spinal cord injury, therefore affecting patient's quality of life. Pedicle Subtraction Osteotomy (PSO) is designed to correct sagittal plane deformity in these patients hence relieve spinal compression and improve neurological function.

REPORT:

39 years old male with underlying Hepatitis B and C and history of L1 burst fracture in 2022 presented with progressive lower back pain and weakness of bilateral lower limb. On examination, noted power 3/5 at level L2-L3 and 0/5 at L4-S1 bilaterally, hyporeflexia at bilateral L3 and S1 level. MRI reported old fracture of T12 and L2 vertebral body, L1 acute compression fracture with retrolisthesis causing severe spinal canal and neural foramen narrowing resulting in gibbus deformity and cauda equina impingement. He underwent decompression, PSIF, laminectomy, pedicle subtraction and osteotomy of L1. At 4 months post op, power at L2-L5 improved to 4/5 and achieved full power 5/5 at S1 level bilaterally.

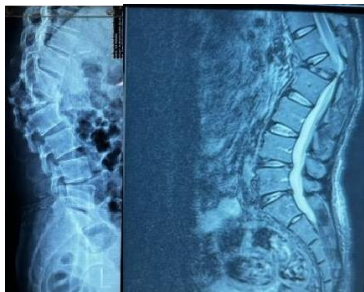


Figure 1: Radiological image showing L1 compression fracture with kyphosis. MRI image showing spinal canal stenosis at fracture level.

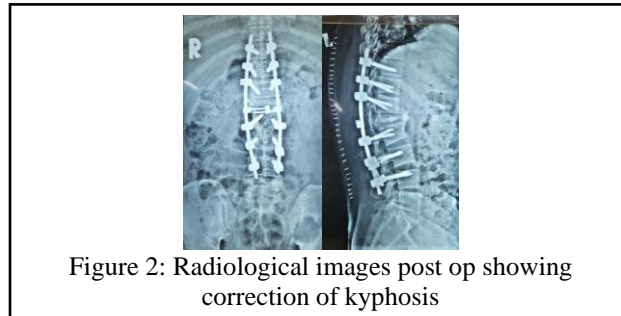


Figure 2: Radiological images post op showing correction of kyphosis

PSO allows maximal amount of segmental correction via single-stage procedure as described by Li et al. Bridwell et al. reported significant improvements in pain in patients treated with PSO for fixed sagittal imbalance. They also reported temporary new onset neurological deficits as a complication. Murrey et al. and Lehmer et al. reported similar findings. Smith et al. identified rod fractures following PSO as a long-term complication. Otani et al. believe that interbody fusion at proximal level using Lehmer's PSO and at distal level using TLIF was effective in preventing rod fractures. Otani et al. noticed significant risk of intraoperative bleeding, iatrogenic nerve injury, deep vein thrombosis, and delirium as major complications of PSO.

CONCLUSION:

Improvements in pain and functional status is gratifying in patients treated with PSO. Shorten operative time, use of intra-operative neuromonitoring and multidiscipline intensive post-operative care are key to minimize complications.

REFERENCES:

1. Heary et al., J. Neurosurg: Spine/Volume 5/July, 2006.
2. Otani et al., Spine Surg Relat Res. 2018;2(3):221-225.