



Approaching the Curve Convexity or Concavity with Minimally Invasive Lateral Transpsoas Lumbar Interbody Fusion in Adult Patients with Thoracolumbar Degenerative Scoliosis: An Analysis of Complications and Radiographic Correction

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Introduction

The minimally invasive lateral transpsoas approach for correction of adult degenerative scoliosis has been shown to be effective and safe. However, it has yet to be determined if correction from either side of the curve apex results in a reduction in complications and/or offers improved corrective ability. The purpose was to compare the approach related neurological complications and magnitude of correction in patients undergoing lateral lumbar interbody fusion (LLIF) for degenerative thoracolumbar scoliosis based on a convex versus a concave approach.

Methods

This is a single center retrospective chart review. Inclusion criteria: patients that underwent a LLIF for adult degenerative thoracolumbar scoliosis and had the LLIF prior to any other supplemental procedures. Patients were grouped based on the LLIF approach toward the curve apex concavity (CAVE) or toward the curve apex convexity (VEX) (Figures 1 and 2). Standard regional and segmental coronal radiographic measurements were made as well as regional sagittal spino-pelvic parameters. Neurological complications and reoperation indications were also recorded.

Results

A total of 32 patients were included (CAVE: 17, VEX: 15) with a mean age of 65.5±10.2yrs and mean follow-up of 17.0±15.7 months. Overall, there were 8 total post-operative neurological complications for 8 (25.0%) patients and 7 reoperations for 6 (18.8%) patients (CAVE: 4/17 [23.5%] and VEX: 2/15 [13.3%]). CAVE had 6/17 neurological complications (35.3%, 4 ipsilateral and 2 contralateral to the approach side) and VEX had 2/15 (13.3%, 1 ipsilateral and 1 bilateral to the approach side, p>0.05). (Table 1). All patients significantly improved in all mean regional and segmental Cobb angles (p<0.05) except for T11-T12 (p>0.05). There were no significant differences between CAVE and VEX for any of the radiographic parameters measured (p>0.05).

Conclusions

Approaching the curve apex from either the concave or convex resulted in significant improvement in correction. The concave approach was associated with more post-operative neurological complications.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) understand that there is no standard approach side to degenerative scoliosis using a LLIF approach, 2) appreciate that either approach may result in similar corrective ability, and 3) acknowledge that there may be a higher incidence of neurological complications using a concave approach probably related to a stretch injury of the lumbar plexus during and following correction.

