Early Experience with a Hybrid Approach to Correcting Adult Degenerative Deformity: Combined MIS-LIF with SPO and Open Instrumentation

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Introduction

Minimally invasive (MIS) approaches to the thoracolumbar spine have recently been gaining popularity given their ability to reduce blood loss, operative time, and hospital stay1,3. Although these techniques have been successfully applied to the adult degenerative deformity patient, they have some limitations when addressing severe degenerative scoliosis3. Despite these shortcomings, the MIS lateral interbody fusion (LIF) offers several advantages1,2. Here we report our early experience with a hybrid approach utilizing MIS-LIF with open Smith-Peterson osteotomies (SPO) and posterior instrumentation to address adult degenerative deformity.

Methods

We reviewed the medical records of all patients who underwent a combined MIS-LIF and open multilevel SPO/facetectomies and fusion spanning T10 to pelvis from January 2015 to June 2016. All patients underwent MIS-LIF across the apex of their curve. SPOs were performed at all levels that underwent interbody fusion. Included patients had at least one of the following: SVA>6cm, LL-PI mismatch>30, or PT>25. 7 patients were identified. 3 patients had preoperative and post-operative

Results

Average postoperative measurements was pelvic incidence (PI) 49.5±3.2°, pelvic tilt (PT) 18.3±5°, Lumbar lordosis (LL) 34.3±13°, C7 sagittal vertical axis (SVA) 30±33.9mm and coronal cob angle (CCA) 2.5±0.6°. Comparing pre- and postoperative scoliosis films showed an average reduction (CI=0.95) in PI by 18.3±12°, PT by 15.7±15°, and CCA by 16±11°. On the other hand, Lumbar lordosis showed an average improvement by 44.3±17°. Pre- and postoperative difference in C7-SVA measured 2±27 mm. Average follow up was 12±8 months. Complications included one patient with ureteral injury.

Conclusions

MIS-LIF combined with open posterior SPOs and instrumentation is a powerful tool for addressing adult degenerative deformity. Risks of combined approaches must be weighed against potential benefits including improved sagittal and coronal balance and improved fusion rates.

Learning Objectives

combining MIS lateral interbody fusion with posterior Smith-Peterson osteotomies (SPO) and posterior instrumentation will allow better improvement spinal alignment when compared to standard MIS interbody fusion combined with MIS posterior fusion

References

References

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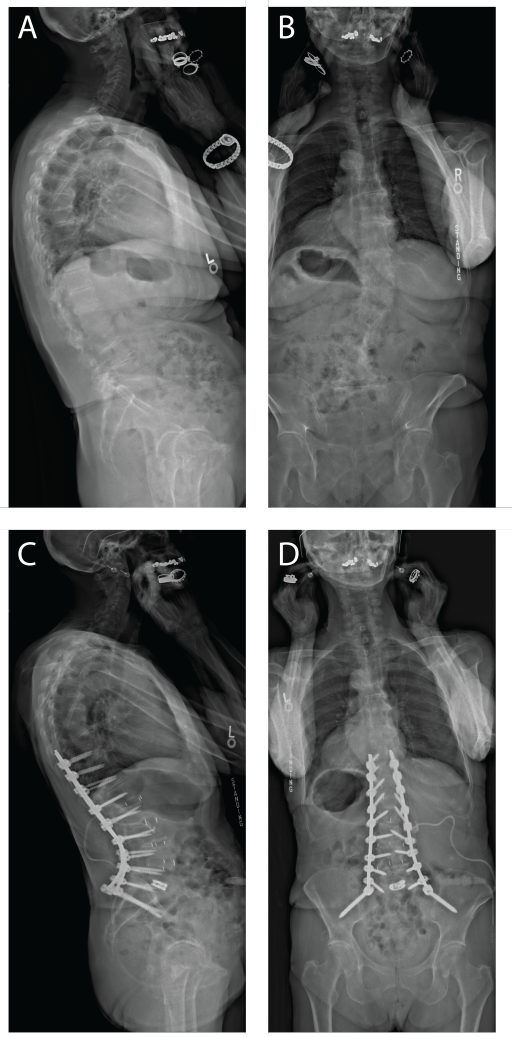
figure



Preoperative Sagittal (A) and coronal (B) standing scoliosis films. Postoperative sagittal (C) and coronal standing scoliosis films. Comparing the pre and postoperative sagittal films, note how the lumbar kyphosis and excessive pelvic tilt was corrected. Comparing pre- and postoperative coronal films shows significant improvement in the levoscoliosis after surgery