



Novel Algorithm for the Surgical Management of Lumbar Adjacent-Segment Disease: Adding Modern Techniques to the Surgeon’s Armamentarium

Jason Ilias Liounakos MD; Iahn Cajigas MD PhD; Jonathan N. Sellin MD; Michael Y. Wang MD, FACS
[Institution]

Click To
Add Logo

Introduction

Adjacent-segment disease (ASD) is common following lumbar spinal fusion surgery. While the incidence of radiographic ASD is reported to be as high as 100%, the incidence of symptomatic ASD varies widely, with reports ranging from 0% to 27%. Revision posterior surgery with laminectomy and extension of instrumented fusion remains the mainstay of treatment. We propose a novel treatment algorithm, which aims to incorporate minimally invasive alternatives in order to maximize outcomes while minimizing morbidity.

Methods

We retrospectively reviewed a consecutive series of patients treated surgically for ASD by the senior author (MYW) from September 2007 to January 2018. A treatment algorithm based on this series was constructed. To assess the algorithm, patient demographics, surgical characteristics, and pre-operative/post-operative numeric pain scale (NPS) scores for back and leg pain were analyzed, as well as complication, pseudoarthrosis, and revision rates.

Results

Ninety patients undergoing surgery for 92 index cases of ASD were reviewed. Mean follow-up was 13.5 months. Patients underwent open extension of fusion (n=52), stand-alone lateral lumbar interbody fusion (LLIF) (n=28), endoscopic-assisted decompression +/- discectomy (n=4), or open decompression (n=8). Age, sex, number of previously fused levels, and number of levels of ASD did not vary significantly between groups. Hospital length of stay and EBL was greatest for open extension of fusion. Significant improvements in NPS scores were seen for back and leg pain following open extension of fusion (p<0.001, p<0.001) and LLIF (p=0.01, p<0.001). Significant improvement in NPS scores for leg pain (p<0.001) was observed in endoscopic-assisted decompression. Low rates of surgical complications and pseudoarthrosis were present in all groups. Endoscopic-assisted decompression was associated with the highest revision rate (50%).

Conclusions

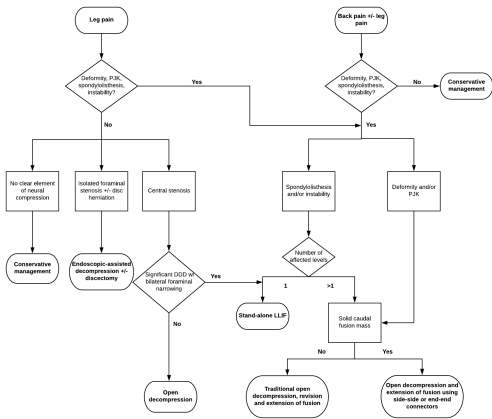
Adjacent-segment disease is amenable to a multitude of surgical interventions given appropriate clinical and radiographic indications. Less invasive alternatives may help reduce surgical morbidity, EBL, and length of stay while providing

Learning Objectives

- By the conclusion of this session, participants should be able to:
- 1)Describe the importance of prevention, identification, and management of adjacent-segment disease after thoracolumbar fusion.
 - 2)Discuss, in small groups, the various surgical treatment options and patient selection criteria for the management of adjacent-segment disease.
 - 3)Identify an effective treatment algorithm for the surgical management of adjacent-segment disease.

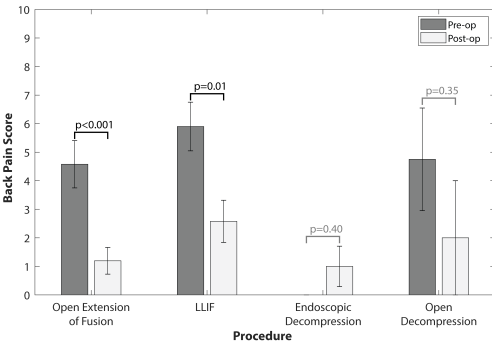
References

Figure 1: Adjacent-Segment Disease Treatment Algorithm



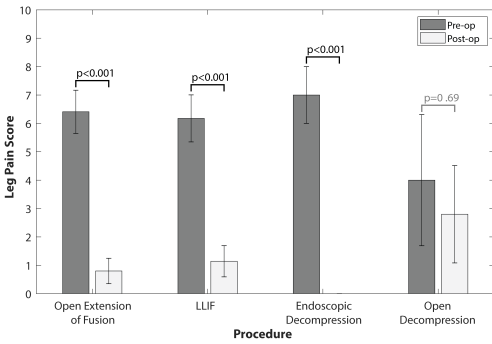
DDD: degenerative disc disease, LLIF: lateral lumbar interbody fusion, PJK: proximal junctional kyphosis

Figure 2: Pre-operative and Post-operative Numeric Pain Scale Scores for Back Pain



LLIF: lateral lumbar interbody fusion

Figure 3: Pre-operative and Post-operative Numeric Pain Scale Scores for Leg Pain



LLIF: lateral lumbar interbody fusion