

Safety and Efficacy of L5-S1 Inclusion in Multi-Level Oblique Lumbar Interbody Fusions

Danyal Quraishi BS, Shahed Elhamdani MD, Chen Xu MD, Alexander Yu MD

Background: Lumbar interbody fusions have become a widespread technique in addressing the lumbar spine for spinal conditions such as spondylolisthesis, degenerative pathologies, and disc herniations. The oblique lumbar interbody fusion (OLIF) enables secure access to most lumbar levels, as a generous space between the psoas and aorta facilitates a secure and uncomplicated approach to the discs above L5. However, incorporating L5–S1 in this approach warrants concern due to the intricate vascular anatomy beyond the bifurcation of the great vessels. Due to this complexity when including L5–S1 in OLIFs, one may hypothesize that L5–S1 inclusion increases the likelihood of complications and morbidity associated with the procedure. This study aims to illustrate our experience with the safety and efficacy of including L5–S1 during multi-level OLIFs using a modified technical approach.

Methods: This was a single-institution, retrospective analysis of patients undergoing a multi-level, modified OLIF procedure within the L5-S1 region. A standard OLIF technique was performed with the exception that a retractor was placed above the psoas, allowing direct visualization of the psoas, and dynamic retraction was utilized to enter and visualize the disc space. All L5-S1 levels were performed in conjunction with multi-level fusion constructs. Data was abstracted from Electronic Health Records, including basic patient characteristics, number of levels, posterior instrumentation, and any new postoperative complications.

Results: Among 63 patients, the overall modified OLIF complication rate during multi-level fusions that included the L5-S1 region was 15.9%. 5 patients (7.9%) denoted a motor complication. This included extremity weakness, foot drop, iliopsoas weakness, and quadriceps weakness. One patient who experienced iliopsoas weakness improved after clinical follow-up. 5 patients (7.9%) indicated a sensory complication. This included pain within the legs, hip flexor, or anterior thigh numbness. One patient who experienced right anterior thigh numbness improved after clinical follow-up.

Conclusions: Our study shows that an oblique lumbar interbody approach to L5–S1 is safe and feasible when incorporating a modified OLIF approach. Our cohort demonstrated fewer motor and sensory complications compared to the literature-reported values. Considering all L5-S1 levels were operated on in conjunction with other multi-level fusion constructs, the observed complications may be associated with the over levels. Nonetheless, L5–S1 inclusion could add complexity due to the mobilization of large vascular structures. Additional studies are needed to further evaluate and monitor this novel technique's efficacy and complication profile when addressing the L5-S1 level.