## Impact of Single-Level Minimally Invasive Versus Open L4-L5 and L5-S1 Transforaminal Lumbar Interbody Fusion on Postoperative Distal and Lumbar Lordosis

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INTRODUCTION: Restoring or maintaining L4-S1 DL and LL is an important component of TLIF surgery. However, the current literature is conflicting regarding the effect of surgical approach on these postoperative sagittal parameters. The objective of this study was to compare distal lordosis (DL) and lumbar lordosis (LL) generated by single-level minimally invasive transforaminal lumbar interbody fusion (MI-TLIF) and open TLIF at L4-L5 and L5-S1. METHODS:

Preoperative DL and LL were compared to postoperative values among adult patients undergoing single-level MI- and open TLIF surgeries. Subgroup analyses were performed with patients stratified based on pre-operative DL (low <  $25^{\circ}$ , normal  $\geq 25^{\circ}$ ) and pelvic incidence (PI) (low <  $45^{\circ}$ , moderate  $45-60^{\circ}$ , high >  $60^{\circ}$ ). Regression analyses were conducted to determine factors associated with postoperative DL and LL.

RESULTS: Of the 285 patients included in the study, 211 underwent MI-TLIF (74.0%) and 74 (26.0%) underwent open TLIF. There were no differences in DL or LL between patients undergoing MI- and open TLIF at any postoperative timepoint regardless of their preoperative DL or PI. Patients with a high preoperative PI obtained a significant increase in LL at 6-month follow-up with an open TLIF ( $\Delta 4.2^{\circ}$ , p=0.009) but not with an MI-TLIF ( $\Delta -0.8^{\circ}$ , p=0.151). Patients with a preoperative DL  $\geq$  25° experienced a decrease in DL at 6-month follow-up with both an open TLIF ( $\Delta -2.0^{\circ}$ , p=0.013) and MI-TLIF ( $\Delta -1.4^{\circ}$ , p=0.011). Patients with a preoperative DL  $\geq$  25° also experienced a decrease in LL at 6-month follow-up with an MI-TLIF ( $\Delta -1.0^{\circ}$ , p=0.002) but not with an open TLIF ( $\Delta -0.3^{\circ}$ , p=0.552). Patients with a preoperative DL < 25° obtained an increase in both DL and LL with both MI-TLIF and open TLIF.

DISCUSSION AND CONCLUSION: There are no significant differences in postoperative DL or LL between patients undergoing single-level MI- or open TLIF at L4-L5 or L5-S1. Both MI-TLIF and open TLIF are effective for restoring DL and LL among patients with a low preoperative DL (<25°). However, patients with a high preoperative PI (>60°) may

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