Transforaminal Lumbar Interbody Fusion Does Not Correct Lordosis, A Factor Related to the Occurrence of Adjacent Segment Disease

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INTRODUCTION:
The preference of using interbody fusions varies among surgeons. A lot of controversies exist around whether or not transforaminal lumbar interbody fusions (TLIFs) can help achieve ideal lordosis values. This study aims to analyze whether or not TLIF can achieve ideal segmental lordosis values and whether achievement of ideal segmental lordosis influences complication rates.
METHODS:
The study cohort included patients who underwent TLIF between L3 and S1. Patients were grouped based on TLIF location: L3-L4 (designated as Group 1, G1), L4-L5 (G2), and L5-S1 (G2). Segmental lordosis correction was assessed at 6 weeks, 1 year, and 2 years within each group and compared between groups. Additionally, a sub-analysis focused on patients with an upper instrumented vertebra (UIV) at L4 or above and a lower instrumented vertebra (LIV) below L5. Two subgroups were formed based of whether or not their 6-week radiographic L4-S1 lordosis fell within the ideal interval (35-45°), the first with L4-S1 outside the interval and the second with L4-S1 within the ideal interval.
RESULTS:
91 patients were included in G1, 267 in G2, and 99 in G3. In G1, the L3-L4 segmental lordosis did not significantly differ across baseline (10.0°), 6 weeks (10.1°), 1 year (10.2°), and 2 years (10.5°), $p>0.05$. For G2, the L4-L5 segmental lordosis increased from baseline (13.4°) to 6 weeks (14.1°) and 2 years (14.6°), $p<0.05$. For G3, L5-S1 segmental lordosis did not significantly differ at baseline (17.2°), 6 weeks (18.5°), 1 year (17.4°), and 2 years (20.4°), $p>0.05$. When comparing correction of segmental lordosis between the three groups, there was no significant difference. Sub-analysis included 184 eligible patients, 27 with L3-L4 TLIF, 105 L4-L5 TLIF, and 52 L5-S1 TLIF. Of these, 71 patients had two-year follow-up and did not show a significant improvement in L4-S1 lordosis from baseline (30.9°) to 2 years (31.1°). Additionally, 69 patients had 6 weeks follow up and 78% of them (n=54) were outside of the ideal L4-S1 interval. These patients had a higher rate of adjacent segment disease (34.0%) compared to the patients within the interval (6.7%), $p=0.038$.
DISCUSSION AND CONCLUSION: These findings suggest TLIF may not be effective method for attaining optimal segmental lordosis values. Importantly, failure to achieve these ideal values could potentially pose a risk to patients. Our analysis identified a higher rate of adjacent segment disease in patients who have not achieved segmental L4-S1 lordosis.