Comparison of Two Minimally Invasive Techniques: MIS TLIF vs XLIF in the Treatment of Degenerative Disc Disease in Single-level Lumbar Fusion at L4-L5
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Background context: Standard techniques for lumbar fusion surgery involve open exposures and extensive muscle dissection. Minimally invasive surgery (MIS) for lumbar fusion is becoming viable common alternative to traditional open techniques. In this report, we compare our experience using two minimally invasive alternatives to open fusion at L4-L5: MIS TLIF and XLIF.

Purpose: To assess the clinical and radiographic outcomes of MIS (TLIF) supplemented with pedicular lumbar screw by a percutaneous approach in comparison with standalone XLIF, contrasting the safety and effectiveness of each MIS alternative.

Study design/setting: Prospective clinical and radiographic assessment.

Patient sample: 39 patients (14 MIS TLIF, 25 XLIF)

Outcome measures: Visual analog pain score (VAS), Oswestry disability index (ODI) and radiographs were evaluated preoperatively and at various time-points postoperatively. Complications and length of hospital stay were also assessed.

Methods: 39 patients underwent MIS treatment (14 MIS TLIF, 25 XLIF) of symptomatic L4-L5 disc. Outcomes and complications are reported. Patients were followed clinically and radiographically for up to 24 months postoperatively.

Results: A consecutive 14 patients, ranging in age from 19-72 years, 12 M, 2 F, underwent MIS TLIF; and a following 25 patients, ranging in age from 28 - 74 years, 7 M, 8 F, underwent XLIF. All patients underwent single-level fusions at L4-L5. The follow-up period ranged from 2 weeks to 24 months (mean 13.5 months). In the MIS TLIF group mean operative time was 150 minutes and in all cases measured blood loss was less than 60 cc. Average length of stay was 2.2 days. Mean back pain VAS decreased from 7.3 at pre-op to 2 at 3 months, 2 at 6 months, and maintained at 2.8 at 24 months. Mean leg pain VAS decreased from 8.2 at pre-op to 1 at 3 months, 1 at 6 months, and 1.5 at 2 years. Mean ODI improved from 61.2 at pre-op to 11 at 3 months, 8 at 6 months, and 9.5 at 2 years. Fusion rate was 38% at 6 months, 52% at 12 months, and 78% at 24 months. In the XLIF group mean operative time was 68 minutes and in all cases measured blood loss was less than 50 cc. Average length of stay was 1.32 days. Mean back pain VAS decreased from 8.1 at pre-op to 2.8 at 3 months, 3.4 at 1 year, 4.8 at 2 years, and 4.6 at 30 months. Mean ODI improved from 53 at pre-op to 19 at 3 months, 22 at 1 year, 21 at 2 years, and 28 at 30 months. Fusion rate was 28% at 6 months, 48% at 12 months, and 74% at 24 months.

Conclusions: We found similar clinical and radiographic outcomes between the two procedures, but lower OR times, blood loss, and length of hospital stay in the XLIF group. Back pain in the early postoperative time due to approach manipulation in the MIS TLIF group is notably higher than in the XLIF group.