Clinical: Lumbar Fusion (i.e. MIS, TLIF, XLIF, Axial LIF, ALIF)

Combination of Minimally Invasive Surgical Techniques (XLIF and TLIF) for the Treatment of Two-level Disc Disease in the Lumbar Spine. Radiological and Clinical Outcomes out to 20 Months

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Background context: Spine surgical procedures are often referred to as an open procedure or minimally invasive. Open procedures require larger incisions, muscle stripping, more anesthesia, operating time, and hospitalization. Consequently, the patient usually needs more time to recuperate. Minimally invasive surgical techniques utilize portals or small incisions made in the skin (percutaneous). The purpose of this study was to assess the benefits of combining two different minimally invasive techniques in the treatment of two-level lumbar disc disease.

Purpose: To assess the clinical and radiographic outcomes in combining two different minimally invasive techniques in the treatment of two-level lumbar disc disease (XLIF L4-L5 and MIS TLIF L5-S1).

Study design/setting: Prospective clinical study.

Patient sample: 17 patients

Outcome measures: Visual analog pain score (VAS) and Oswestry disability index (ODI) were evaluated preoperatively and at various time-points postoperatively. VAS included the assessment of both back pain and leg pain.

Methods: 17 patients underwent XLIF L4-L5 and MIS TLIF L5-S1 for the treatment of two-level symptomatic low back and/ or leg pain or dysfunction. The interbody graft used in both levels was a PEEK interbody implant filled with DBM in a lipid carrier mixed with autograft bone in the TLIF implant and DBM in a lipid carrier mixed with hydroxyapatite and tri-calcium phosphate granules in XLIF devices. TLIF levels were supplemented with pedicle screw fixation by a percutaneous approach. Patients were followed clinically and radiographically for up to 20 months postoperatively.

Results: 17 patients with symptomatic two-level lumbar disc disease were included. Mean patient age was 47 yrs (range: 24-68 yrs). All patients had a two-level disease L4-L5 and L5-S1. Mean combined operative time was 180 minutes and in all cases measured blood loss was less than 75 cc. Patients were typically out of bed, ambulating and advanced to regular diet on the day of surgery, and discharged home the following 48 to 72 hours. Mean back pain VAS decreased from 7.4 at pre-op to 3.6 at 3 months, 3.4 at 6 months, and 2.8 at 2 years. Mean leg pain VAS was decreased from 6.8 at pre-op, to 1.8 at 3 months, 3.4 at 6 months, and 0 at 2 years. Mean ODI improved from 52.3 at pre-op to 12 at 3 months, 9.3 at 6 months, and 11 at 2 years. [NuVasive1]

Conclusions: This study showed that the combination of XLIF and MIS TLIF is an effective surgical treatment for two-level lumbar disc disease at L4-L5 and L5-S1. Multilevel fusion at the lumbosacral junction can be achieved using this combination. Postoperative recovery is notably faster than traditional open procedures.