Clinical and Radiographic Outcomes Following MIS TLIF Supplemented with Percutaneous Pedicular Screws (PPS): 24 Months Follow up
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Background context: Standard techniques for lumbar pedicle screw fixation involve open exposures and extensive muscle dissection. The purpose of this study was to report the initial clinical experience with a device for percutaneous posterior fixation of the lumbar spine.

Purpose: To assess the long-term maintenance of clinical and radiographic outcomes using a combination of minimally invasive transforaminal interbody fusion (TLIF) supplemented with pedicular lumbar screw by a percutaneous approach.

Study design/setting: Prospective clinical study.

Patient sample: 78 patients

Outcome measures: Pain visual analog score (VAS for both back and leg pain), Oswestry disability index (ODI) and radiographs were evaluated preoperatively and at various time-points postoperatively.

Methods: 78 patients underwent MIS TLIF and PPS for the treatment of symptomatic low back and/or leg pain or dysfunction. A contoured (banana shaped) PEEK interbody implant filled with DBM in a lipid carrier mixed with autograft bone was placed in the disc space at the operative level followed by PPS. Patients were followed clinically and radiographically for up to 24 months postoperatively.

Results: The 78 patients ranged in age from 19-72 years. 13 had Grade I or II spondylolisthesis and 9 had a failed prior discectomy. All patients underwent successful percutaneous fixation. 75 patients underwent single-level fusions (73 at L5-S1, 16 at L4-5, 2 at L3-4, 1 at L2-3 and 1 at L1-2), and three underwent two-level fusions (from L4 to S1). The follow-up period ranged from 3 to 24 months (mean 13.5 months). Mean combined operative time was 150 minutes and in all cases measured blood loss was less than 60 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 7.3 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 1.2 at 3 months, 1 at 6 months, and maintained at 1.5 at 2 years. Mean ODI improved from 61.2 at pre-op to 11 at 3 months, 8 at 6 months, and maintained at 9.5 at 2 years. Fusion rate was 38% at 6 months, 52% at 12 months, and 78% at 24 months.

Conclusions: The current results support prior reports of interbody fusion (TLIF) with percutaneous lumbar pedicle screw placement, with optimal fusion rate and clinical improvement. Paraspinous tissue trauma is minimized without compromising the quality of spinal fixation.