Five-year Retrospective Review of Full-endoscopic Lumbar Fusion Outcomes in Cohorts with Minimal Spinal Deformity Performed at Ambulatory Surgery Center

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BACKGROUND

Posterior lumbar intervertebral fusion (PLIF) is a standard treatment for back pain due to degenerative disc disease and lumbar instability. Traditional open PLIF has been associated with extensive tissue dissection, excessive blood loss, and long recovery time. Full-endoscopic transforaminal lumbar interbody fusion (FE-TLIF) is an evolving treatment for intractable back pain.

OBJECTIVES

This study aims to evaluate surgical outcomes of FE-TLIF performed in ambulatory surgery center (ASC) on patients with advanced disc disease, intractable pain and minimal spinal deformity.
METHODS

Our WIRB-approved retrospective study (WIRB# 1-925640-1) addresses operative time (OR time), post-anesthesia recovery time (PACU time), visual analog scale (VAS) for back and leg pain, blood loss, complication rates, and satisfaction ratings of eighty-five patients who underwent FE-TLIF between 2011 and 2015.

There were no cases of scoliosis or other advanced spinal deformities. Of the 85 study cohort, 75 had one-level fusion and 10 had two-level fusion. All patients had intraoperative epidural anesthesia. Statistical analysis was performed to uncover relationships between risk factors (patient demographics and clinical presentation) and outcome measurements.
RESULTS – EBL

![Estimated Blood Loss Graph]

No. Patients

0-5 CC | 5-20 CC | 20-50 CC

- 58
- 21
- 6

Estimated Blood Loss

RESULTS – INTRA-OP X-RAYS

(a) AP view of pedicle screw fixation
(b) Lateral view of pedicle screw fixation
(c) AP view of facet screw fixation
(d) Lateral view of facet screw fixation
• **Intra-operative:** No intra-operative complications observed.
• **Post-operative:** 2 cases of transient post-operative sympathetically mediated pain and 3 re-operations.
RESULTS – OR/ PACU TIMES

OR time
- Patients with two-level fusion was 110 minutes longer than for those with one-level operation.
- BMI and age had no significant effect on OR time

PACU time
- Patients with two-level fusion had an estimated 29 percent increase in PACU time relative to those with one-level fusion.
- Heavier patients had modest increase in PACU time.
- Gender and age did not affect PACU time.
RESULTS – ANATOMICAL FINDINGS

- Global sagittal alignment measurements were not performed as study cohorts presented with minimal spinal deformities.

- Male pelvic anatomy did present higher difficulty to access L5/S1 compared to other levels, however, FE-TLIF was successfully performed for all patients.
RESULTS – VAS

VAS for both back and leg pain decreased from 7 to 2 at one-year post-operative.
RESULTS – PATIENT SELF-REPORTED SATISFACTION

Satisfaction with Surgery

<table>
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<th>Percentage</th>
<th>GREAT DEAL</th>
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<th>LITTLE SATISFIED</th>
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<td>6 months</td>
<td>68.29</td>
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<td>9 months</td>
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<td>12 months</td>
<td>95.00</td>
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Recommend This Type of Surgery

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<tr>
<th>Percentage</th>
<th>6 MONTHS</th>
<th>9 MONTHS</th>
<th>12 MONTHS</th>
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<td>Yes</td>
<td>95.00</td>
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<tr>
<td>No</td>
<td>5.00</td>
<td>15.00</td>
<td>14.29</td>
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Legend:
- 6 months
- 9 months
- 12 months

Legend:
- Yes
- No
LIMITATIONS:
There is a lack of “open group” for comparison. Comparison with traditional open spine surgery was done by literature review. Surgeries were performed by a single surgeon, therefore limiting the applicability of study. Further studies with multi-center participation are needed.

CONCLUSION:
This level-II retrospective study demonstrates FE-TLIF as a viable technique for lumbar fusion in an ASC. Furthermore, it demonstrates safety and efficacy in a variety of clinical presentations, including obesity, extremes of age, and anatomic access challenge. None of the cohorts presented with significant spinal deformities, hence, further study is required to determine the application of FE-TLIF technique to treat patients with advanced spinal deformities.