

Related Quality of Life Outcomes with Minimally Invasive Transforaminal Lumbar Interbody Fusion Based on Long-Term Analysis of 318 Consecutive Patients

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Introduction

Long-term prospective outcomes in patients undergoing minimally invasive spinal fusion for debilitating back pain has not been well studied.

Patients and Methods

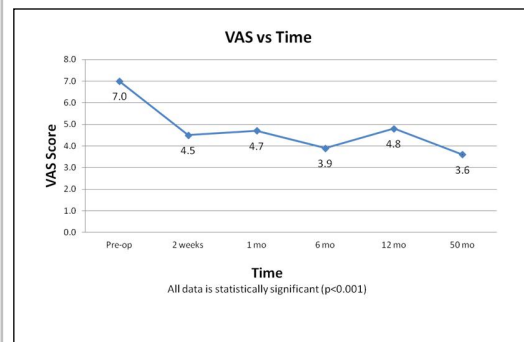
Minimally invasive transforaminal lumbar interbody fusion (MITLIF) was performed on 318 consecutive patients (196 females, 122 males) from September 2003 to December 2010 using a paramedian, muscle-sparing approach. Mean age was 62.4 years (range: 19-93). Diagnosis included lumbar spondylolisthesis (n=236) and degenerative disc disease (n=82), based on radiographic evaluation. The majority of cases were at L4-L5 (n=151) and L5-S1 (n=87). Other cases included L1-L2 (n=4), L2-L3 (n=17), L3-L4 (n=33), and multi-level cases (n=10).

Fusion was assessed using lumbar CT-scans. A key criterion for fusion was the presence of osseous bone bridging between vertebrae. Functional outcomes were measured using the visual analog scale (VAS) and Oswestry Disability Index (ODI). Quality of life outcomes were measured using the Short Form 36 (SF-36) questionnaire. Patients were assessed in the office pre-operatively, at two weeks, six months, and twelve months post-operatively, and prospectively followed-up with by telephone.

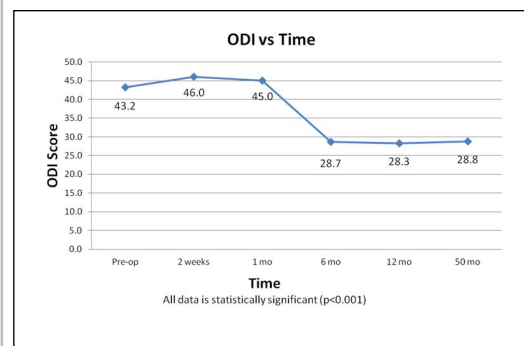
Results

Estimated blood loss and hospital stay was 128.4 mL and 4.37 days, respectively. Fusion rate was greater than 95% at 2-year follow-up. The mean final follow-up time was 50 months (range: 2-7 years), at which re-operation rate for adjacent level disease was less than 2%.

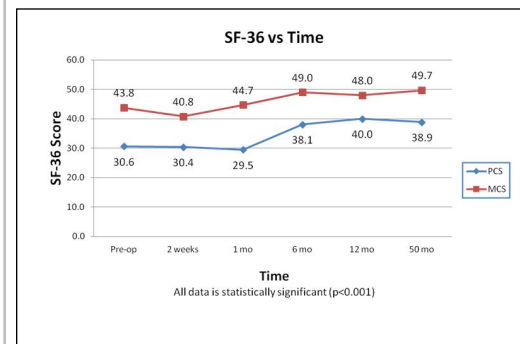
Short-term VAS scores decreased significantly from 7.0 pre-operatively to 4.5 at 2 weeks follow-up. Mid/long-term VAS scores were 4.8 and 3.6 (p<0.001) at 12 and 50 months follow-up, respectively.



ODI scores declined from 43.2 pre-operatively to 28.3 and 28.8 (p<0.001) at 12 and 50 months follow-up, respectively.



SF-36 mental component scores (MCS) increased from 43.8 pre-operatively to 48.0 and 49.7 (p<0.001) at 12 and 50 months follow-up, respectively. Similarly, SF-36 physical component scores (PCS) increased from 30.6 pre-operatively to 40.0 and 38.9 (p<0.001) at 12 and 50 months follow-up, respectively.



Overall, VAS scores displayed a 48.6% improvement, ODI scores displayed a 33.1% improvement, SF-PCS displayed a 13.3% improvement, and SF-MCS displayed a 13.3% improvement from baseline at 2-7 years follow-up.

Summary of results

Survey	Preoperative	50 month follow up	Percent improvement (50 month)
VAS	6.99	3.59	48.6%
ODI	43.15	28.83	33.1%
SF-PCS	30.61	38.90	27.08%
SF-MCS	43.84	49.68	13.3%

Conclusions

MITLIF resulted in a high rate of spinal fusion and a very low rate of adjacent segment disease requiring re-operation. Glassman et al [1] established that substantial clinical benefit is achieved following lumbar spine arthrodesis with a 41.4%, 36.8%, and 19.4% improvement in VAS, ODI, and SF-PCS outcomes, respectively. Per these criteria, this study presents a large, long-term, prospective outcomes analysis of MITLIF revealing clinically and statistically significant outcome improvement out to seven years. In addition, short-term (2 week) VAS outcomes for low back pain also displayed clinical and statistically significant improvement. This study, therefore, endorses the practicality of using minimally invasive surgical techniques in lieu of traditional open surgery to promote prompt recovery and good short and long-term outcomes.

Learning Objectives

- Review long term outcome analysis of minimally invasive spine fusion for chronic low back pain disorders.
- Understand patient selection and indications for MITLIF.
- Review techniques used in achieving outcomes.

References

- Glassman, SD. Defining substantial clinical benefit following lumbar spine arthrodesis. J Bone Joint Surg AM, 2008;1839-47.