



Perioperative and Postoperative Complications of Multi-level Minimally Invasive Transforaminal Lumbar Interbody Fusion for Spinal Degeneration in the Elderly

Chad F Claus D.O.; Evan Joseph Lytle DO; Doris Tong MD; Matthew Bahoura BA; Jake Jasinski D.O.; Ascher B Kaufmann BS; Boyd Richards DO; Teck-Mun Soo MD
[Institution]

Click To
Add Logo

Introduction

Elderly patients undergoing traditional open spinal surgery are considered having high complication risk.1–3 Perioperative and postoperative complications risks for the elderly undergoing minimally invasive (MIS) multi-level transforaminal lumbar interbody (MLTLIF) fusion are not well studied.4–6 We sought to demonstrate that MIS MLTLIF can be safely performed in the elderly.

Methods

A retrospective analysis was performed on consecutive patients aged 70 or older who underwent ML (> 2 level) MIS TLIF at a single institution from 2013-2017. Patients were excluded if the surgery was performed for non-degenerative etiologies. Electronic Medical Records were analyzed for patient demographics, procedures, and perioperative and postoperative complications. Complications were defined as major or minor based on Carreon’s classification.2 Postoperative period was defined as 30 days after surgery and perioperative period was defined as the duration of hospitalization.

Results

One-hundred-fifty-four patients underwent MIS MLTIF. Their average age was 76.4 years (range 70-90). Patient demographics and perioperative characteristics are detailed in Table 1. We observed 13 major (8.44%) 74 minor (48.05%) complications (Table 2) with 67 patients (43.5%) experiencing at least one major or minor complication (Table 3). The 13 major complications included acute kidney injury (4/2.60%), wound seroma and/or hematoma (3/1.95%) requiring surgical evacuation, pneumonia (2/1.30%), pulmonary embolism (1/0.65%), epidural abscess (1/0.65%), respiratory distress (1/0.65%), and adjacent level fracture (1/0.65%). The primary minor complications which occurred were anemia requiring transfusion and urinary retention. There were no myocardial infarctions, hardware complications, major visceral, vascular, neural injuries, or death. The complication rate per fusion level is shown in table 4. Estimated blood loss for the number of levels fused is shown in Figure 1.

Conclusions

MIS MLTLIF can be performed in the elderly (70 years and older) with a major complication rate comparable to other MIS TLIF studies in the elderly4,7 and more

Learning Objectives

By the conclusion of this session, participants should be able to: 1) identify and describe perioperative and postoperative complications in the elderly undergoing multi-level transforaminal lumbar interbody fusion.

References

1. Deyo RA, Cherkin DC, Loeser JD, et al. Morbidity and mortality in association with operations on the lumbar spine. The influence of age, diagnosis, and procedure. J Bone Joint Surg Am 1992;74:536–43.
2. Carreon LY, Puno RM, Dimar JR, et al. Perioperative complications of posterior lumbar decompression and arthrodesis in older adults. J Bone Joint Surg Am 2003;85-A:2089–92.
3. Fujita T, Kostuik JP, Huckell CB, et al. Complications of spinal fusion in adult patients more than 60 years of age. Orthop Clin North Am 1998;29:669–78.
4. Karikari IO, Grossi PM, Nimjee SM, et al. Minimally invasive lumbar interbody fusion in patients older than 70 years of age: analysis of peri- and postoperative complications. Neurosurgery 2011;68:897–902; discussion 902.
5. Lee DY, Jung T-G, Lee S-H. Single-level instrumented mini-open transforaminal lumbar interbody fusion in elderly patients. J Neurosurg Spine 2008;9:137–44.
6. Rodgers WB, Gerber EJ, Rodgers JA. Lumbar fusion in octogenarians: the promise of minimally invasive surgery. Spine 2010;35:S355-360.
7. Lee P, Fessler RG. Perioperative and postoperative complications of single-level minimally invasive transforaminal lumbar interbody fusion in elderly adults. J Clin Neurosci Off J Neurosurg Soc Australas 2012;19:111–4.
8. Deyo RA, Ciol MA, Cherkin DC, et al. Lumbar spinal fusion. A cohort study of complications, reoperations, and resource use in the Medicare population. Spine 1993;18:1463–70.
9. Raffo CS, Lauerman WC. Predicting morbidity and

Table 1

Table 1: Demographics and Perioperative Characteristics (N = 154)	
Age (Mean ± SD)	76.4 ± 4.7
Sex (n, %)	
Male	69 (44.8%)
Female	85 (55.2%)
BMI (n, %)	
Underweight (BMI<19)	0
Healthy (BMI 19-24.9)	17 (11%)
Overweight (BMI 25-29.9)	65 (42.2%)
Obese (BMI 30-34.9)	48 (31.1%)
Morbidly Obese (BMI >35)	24 (15.6%)
Diagnosis (n, %)	
Degenerative disc disease/Foraminal Stenosis	53 (34.4%)
Degenerative Scoliosis	35 (2.7%)
Spondylolisthesis	48 (31.2%)
Post-laminectomy Syndrome	18 (11.7%)
Number of Levels (n, %)	
2 Levels	111 (72%)
3 Levels	34 (22%)
4 Levels	8 (5%)
5 Levels	1 (0.6%)
Surgical Time (Hours, Mean ± SD)	3.24 ± 1.03
Estimated Blood Loss (mL, Mean ± SD)	642 ± 290
Length of Stay (Days, Mean ± SD)	4.2 ± 2.8
Disposition (n, %)	
Acute Inpatient Rehabilitation	20 (13.0%)
Subacute Rehabilitation	70 (46.5%)
Home	64 (41.5%)

Patient demographics and perioperative characteristics.

Table 2

Table 2: Total Number of Complications in Elderly Patients	
Minor Complications	
Urinary Tract Infection	8
Urinary Retention	20
Anemia Requiring Transfusion	23
Confusion	10
Ileus	4
Hypotensive Episodes	2
Durotomy	2
Deep Venous Thrombosis	0
Corneal Abrasions	0
C. Diff Colitis	0
Arrhythmias	2
Transient Hypoxia	3
Total	74
Major Complications	
Malpositioned Hardware	0
Fracture	1
Neurological Deficit	0
Cerebral Vascular Accident	0
Myocardial Infarction	0
Congestive Heart Failure	0
Pneumonia	2
Respiratory Distress	1
Bowel Injury	0
Acute Kidney Injury	4
Epidural Abscess/Osteomyelitis	1
Pulmonary Embolism	1
Wound Seroma/Hematoma	3
Total	13
Overall Number of Complications	87

Total number of complications in elderly patients.

Table 3

Table 3: Number of Elderly Patients Experiencing Complications	
Patients with 1 Major Complication (n, %)	12 (7.8%)
Patients with 1 Minor Complication (n, %)	58 (37.6%)
Patients with More Than 1 Complication (major and/or minor) (n, %)	18 (11.6%)
Patients with 1 Major or 1 Minor Complication (n, %)	67 (43.5%)

Number of elderly patients experiencing complications