



# Assessment of Radiographic and Clinical Outcomes of an Articulating Expandable Interbody Cage in Minimally Invasive Transforaminal Lumbar Interbody Fusion For Spondylolisthesis

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## Introduction

Inability to correct sagittal imbalances and risk of subsidence have been a limitation of traditional bullet shaped minimally-invasive transforaminal interbody fusion (MIS -TLIF) devices. This study evaluates the use of a crescent shaped articulating expandable lordotic cage, Altera (Globus Medical) in MIS -TLIF.

## Methods

A retrospective review 44 consecutive patients treated at 49 surgical levels. Radiographic outcomes included segmental and global lordosis (L1 to S1), disc height, presence of interbody fusion, and any endplate violations. Clinical outcomes included Numeric Rating Scale for leg and back pain (NRS), and Oswestry Disability Index for low back pain (ODI).

## Results

Thirty-nine patients underwent single level MIS-TLIF, and 5 underwent two level MIS-TLIF. Median OR time for the single level procedures was 139 minutes.

On average, spondylolisthesis corrected 4.3mm (pre = 6.69mm, post = 2.39mm, p<0.001), segmental angle improved 4.94° (pre = 5.63°, post = 10.58°, p<0.001), and segmental height increased 3.1mm (pre = 5.09, post = 8.19, p<0.001). Sagittal parameters trended toward improvement.

Thirty-nine of the 40 levels (92%) with one year CT data had solid fusion across the disc space, through the interbody at one year. Fourteen patients had suspected endplate violation during placement of the cage. Only three of these had any progression of subsidence with an overall subsidence rate of 6% (3 of 49), none of which required further intervention to date.

At 90 days, there were significant reductions in back pain and leg pain on the NRS of -4.2 points (p<0.001), and -4.3 points (p<0.001) respectively. Mean ODI was reduced by 17.6 points, from 41.6 to 27.4 (p<0.001).

## Conclusions

## Learning Objectives

By the conclusion of this session, participants should be able to:

1. Identify limitations of traditional MIS TLIF cages.
2. Understand the strengths and limitations of an expandable, articulating, lordotic cage.
3. Identify patients who would benefit from use of an expandable, articulating, lordotic cage.

## References

1. Bin Abd Razak HR, Dhoke P, Tay KS, Yeo W, Yue WM: Single-Level Minimally Invasive Transforaminal Lumbar Interbody Fusion Provides Sustained Improvements in Clinical and Radiological Outcomes up to 5 Years Postoperatively in Patients with Neurogenic Symptoms Secondary to Spondylolisthesis. Asian Spine J 11:204-212, 2017

2. Brodano GB, Martikos K, Lolli F, Gasbarrini A, Cioni A, Bandiera S, et al: Transforaminal Lumbar Interbody Fusion in Degenerative Disk Disease and Spondylolisthesis Grade I: Minimally Invasive Versus Open Surgery. J Spinal Disord Tech 28:E559-564, 2015

3. Cheng X, Zhang K, Sun X, Zhao C, Li H, Ni B, et al: Clinical and radiographic outcomes of bilateral decompression via a unilateral approach with transforaminal lumbar interbody fusion for degenerative lumbar spondylolisthesis with stenosis. Spine J 17:1127-1133, 2017

4. de Kunder SL, van Kuijk SMJ, Rijkers K, Caelers I, van Hemert WLW, de Bie RA, et al: Transforaminal lumbar interbody fusion (TLIF) versus posterior lumbar interbody fusion (PLIF) in lumbar spondylolisthesis: a systematic review and meta-analysis. Spine J, 2017

5. Djurasovic MO, Carreon LY, Glassman SD, Dimar JR, 2nd, Puno RM, Johnson JR: Sagittal alignment as a risk factor for adjacent level degeneration: a case-control study. Orthopedics 31:546, 2008