

# Expandable TLIF Graft Placement via an Articulating Delivery Arm Facilitates Improved Anterior Graft Placement and Superior Segmental Lordosis

Matthew J. McGirt MD; Scott L. Parker MD; Silky Chotai MD; Clinton J. Devin MD

## Introduction

Transforaminal lumbar interbody fusion (TLIF) is now the most frequently performed method of lumbar arthrodesis in degenerative spine disease. We set out to determine expandable TLIF graft allows for more ventral graft placement, greater foraminal area, and improved segmental lordosis versus static TLIF grafts.

## Methods

Forty-six patients undergoing single-level TLIF were included. Patients composed three cohorts, Fig 1,: 1) straight delivery arm system with static graft(n=14); 2) articulating delivery arm system with static graft(n=16); and 3) expandable TLIF graft via articulating delivery arm(n=16). Degree of segmental lumbar lordosis at fused level and percent anterior location of interbody graft in disc space was assessed radiographically, Fig 2.

## Results

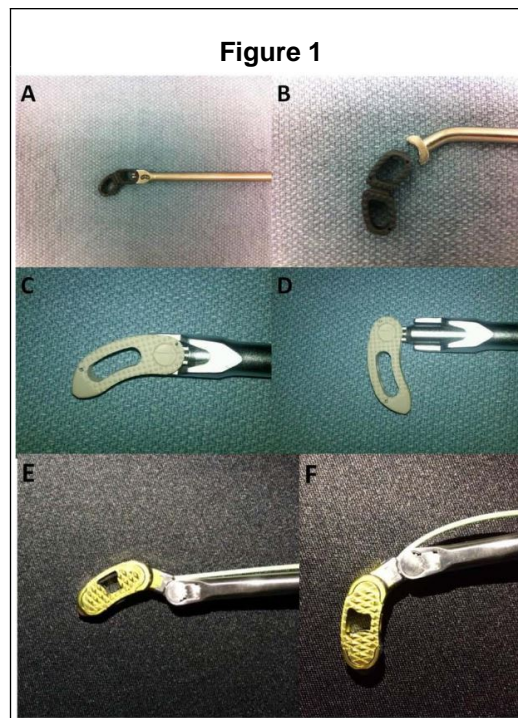
Straight delivery arm-static graft cohort had average of 10.7 degree segmental lordosis at fused level with 54% percent anterior location. Articulating delivery arm-static graft had average of 14.7 degree segmental lordosis with 67% percent anterior location. Articulating delivery arm-expandable graft cohort yielded average of 18.7 degree segmental lordosis with 70% percent anterior location. Use of an articulating arm increased lordosis obtained with static TLIF graft (14.7 degree vs 10.7 degree,  $p < 0.01$ ) while use of expandable vs. static TLIF graft maximized lordosis (18.7 degree vs 14.7 degree,  $p < 0.01$ ), Fig 3. Use of an articulating arm, regardless of graft type, resulted in superior ventral graft placement ( $p < 0.01$ ), Fig 4

## Conclusions

Expandable TLIF graft allows for superior segmental lordosis versus traditional static grafts. This evolution in graft design empowers physicians with the tools to better achieve intraoperative surgical goals during TLIF graft placement.

## Learning Objectives

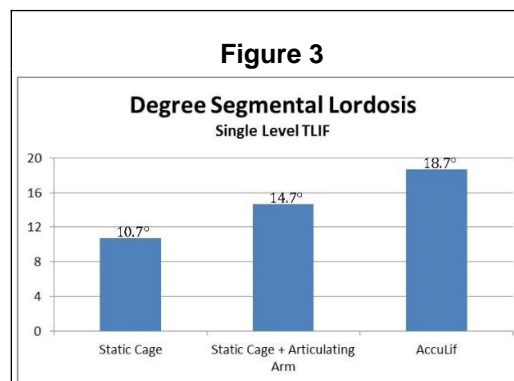
- Use of an articulating arm facilitates increased



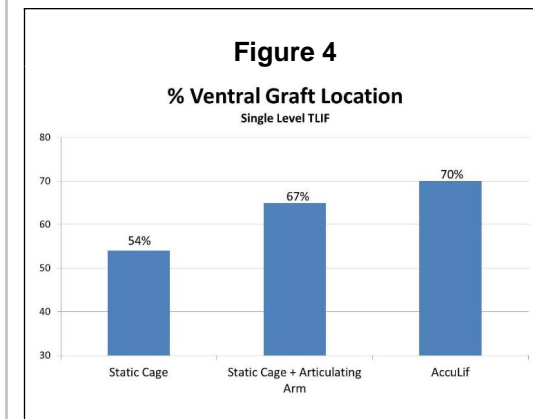
(A) Image of straight interbody graft delivery arm system engaged with static PEEK graft (Leopard®, Depuy-Synthes); (B) secondary impacter used to tamp static graft anterior and contralateral; (C) articulating interbody graft delivery arm system (Signature®, Globus) in the initial insertion position; and (D) articulating interbody graft delivery arm in the completely articulated position 90 degrees. This is the position used to tamp the cage anteriorly once midline cage position is felt to be achieved. (E) Expandable titanium graft on articulating delivery system (AccuLIF®, Stryker) in initial insertion position and (F) articulated position. This is the position used to tamp the cage anteriorly once midline cage position is felt to be achieved.



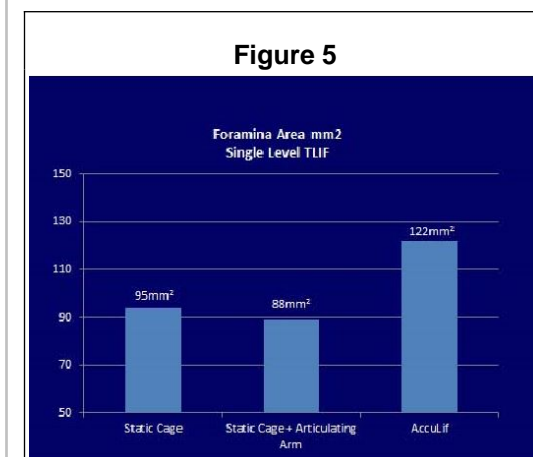
Standing lateral plain film. This images demonstrates the two measurement techniques used in this study. The percent distance along the caudal anterior-posterior endplate length (red lines) was used to determine the percent ventral placement of the midpoint of the interbody graft. The degrees of segmental lumbar lordosis of the fused level was measured using the Cobb angle technique (black lines).



Bar graph comparing the amount of postoperative segmental lordosis for three cohorts of transforaminal interbody fusion (TLIF). There was a significant stepwise improvement in segmental lordosis between static cage, static cage with articulated arm, and expandable cage with articulated arm. Expandable TLIF graft delivered via articulated arm (AccuLIF®, Stryker) provided superior segmental lordosis



Bar graph comparing the percent of ventral graft location for three cohorts of transforaminal lumbar interbody fusion (TLIF). Static and expandable cages had similar degree of ventral location when placed with articulating delivery arm, suggesting the delivery arm is what provides improved ventral graft placement



Bar graph comparing foraminal areas at index level for three cohorts of transforaminal interbody fusion (TLIF). Expandable TLIF graft delivered via articulated arm (AccuLIF®, Stryker) provided significantly increased foraminal area and indirect decompression at the surgical level

[Default Poster]