

## Facilitating Improved TLIF Procedures, with Reduced Operation Time and Blood Loss, using a New Device Enabling Entire Nucleus Removal and Disc Space Preparation

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### Introduction

Transforaminal Lumbar Interbody Fusion (TLIF) is a common spinal fusion procedure, aimed to reduce pain or nerve irritation by eliminating movement between adjoining vertebrae.

Procedure outcome relies on good bone graft implantation, ensured by careful disc space preparation and nucleus and cartilaginous endplates removal. Yet, studies show that cartilage fragments are difficult to remove and nucleus removal is often incomplete.

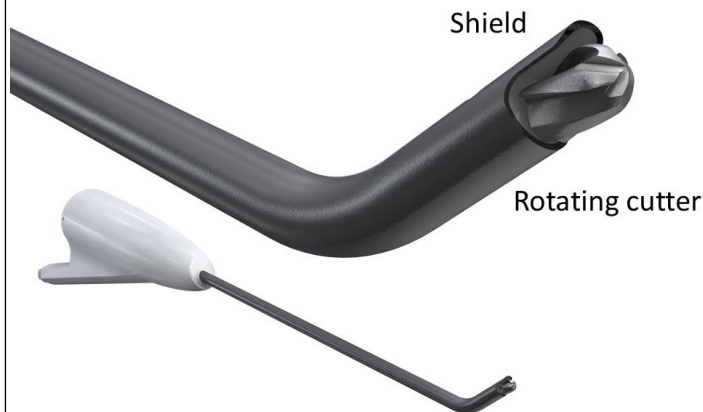
Here we present a modification to the TLIF procedure, potentially allowing entire nucleus removal, facilitated by a dedicated tissue-removal device. The clinical experience accumulated using this method is presented.

### Methods

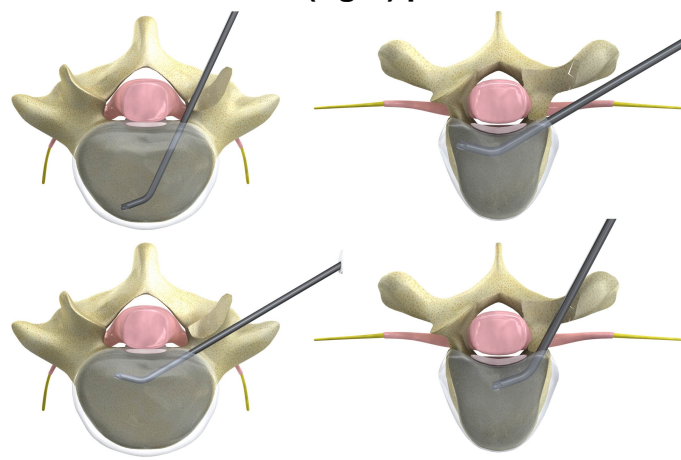
This technique involves opening a small hole in the disc annulus, as with other nucleotomy techniques, followed by inserting the device into the disc space. The cartilage is scrubbed from the bone by means of high-speed rotation then manually removed in a few large fragments, thus lowering the chances of disc tissue and cartilage residuals remaining in the body. The device has a curved tip allowing reach beyond the midline and it was designed to protect both surrounding neural elements and endplates integrity, ensuring the safety of the procedure.

This technique was used to perform 85 lumbar and thoracic TLIF procedures, on varying spinal levels, in a single hospital by five experienced surgeons. Further analysis was performed on clinical data from 23 single-level lumbar procedures and compared with 18 control group procedures.

### The curved-tip drill-like device (bottom) and expanded view of the distal tip (top)

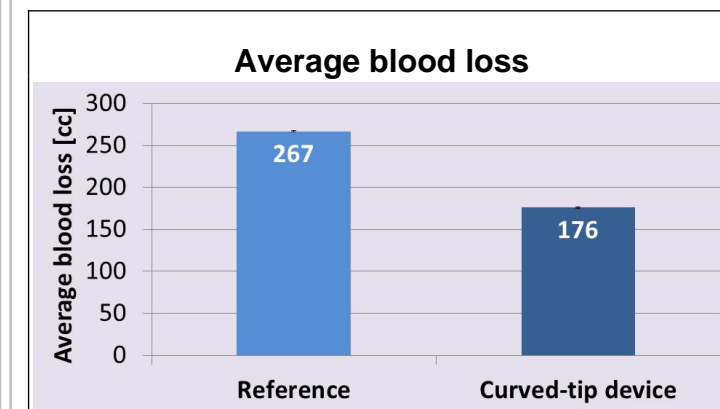
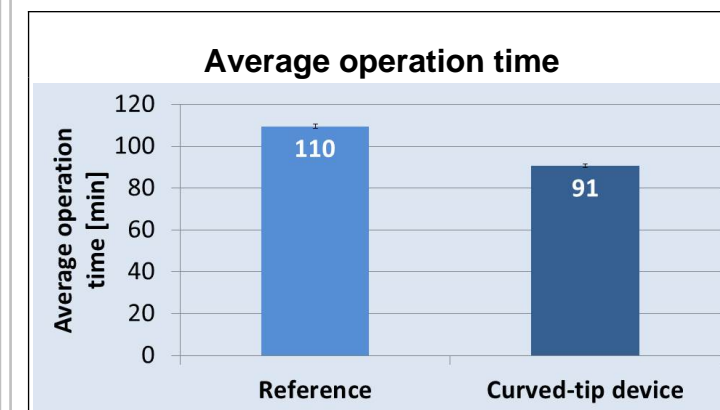


### Examples of device use during lumbar (left) and thoracic (right) procedures



### Results

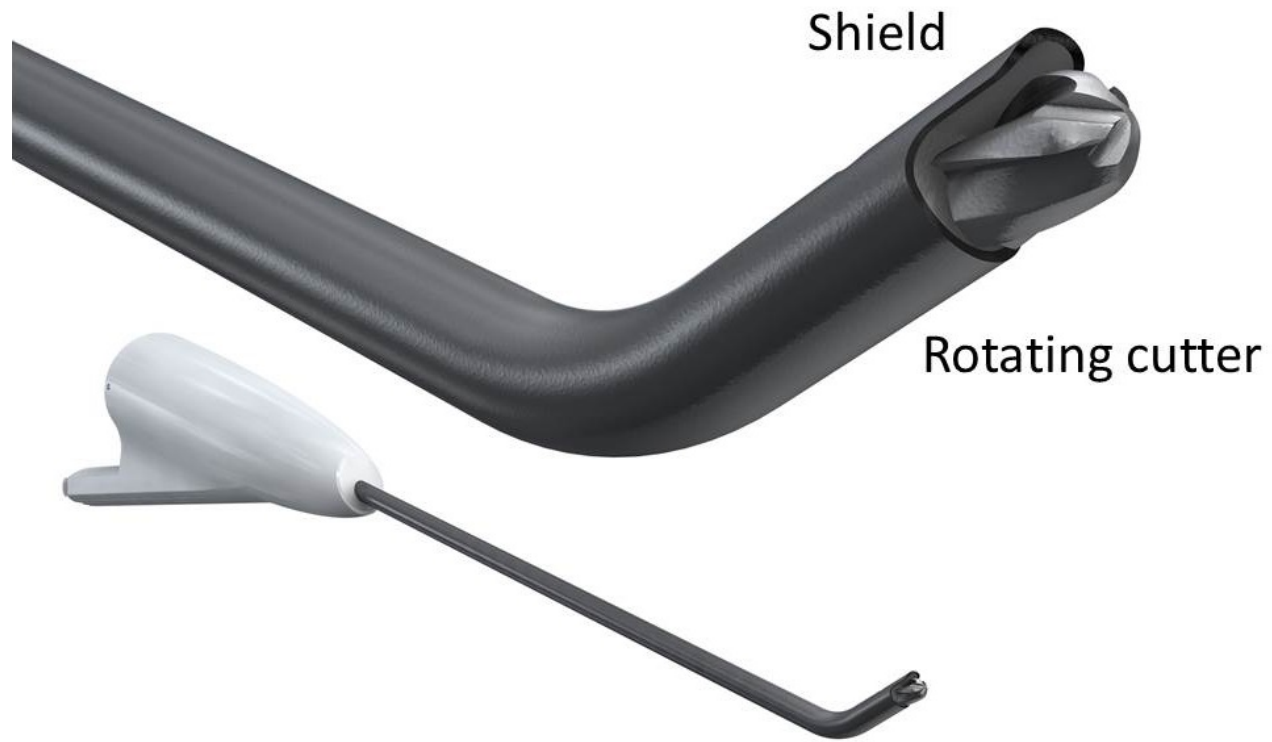
All cases were uneventful, without excess bleeding or dural tears. In the studied subset, average operation time was reduced by 19 minutes (17%,  $p=0.055$ ) and average blood loss was reduced by 90ml ( $p=0.25$ ). The average ODI score for the treated group was lower by 11 points. The number of instrument passes during disc space preparation was lower than referenced for other disc-removal devices.



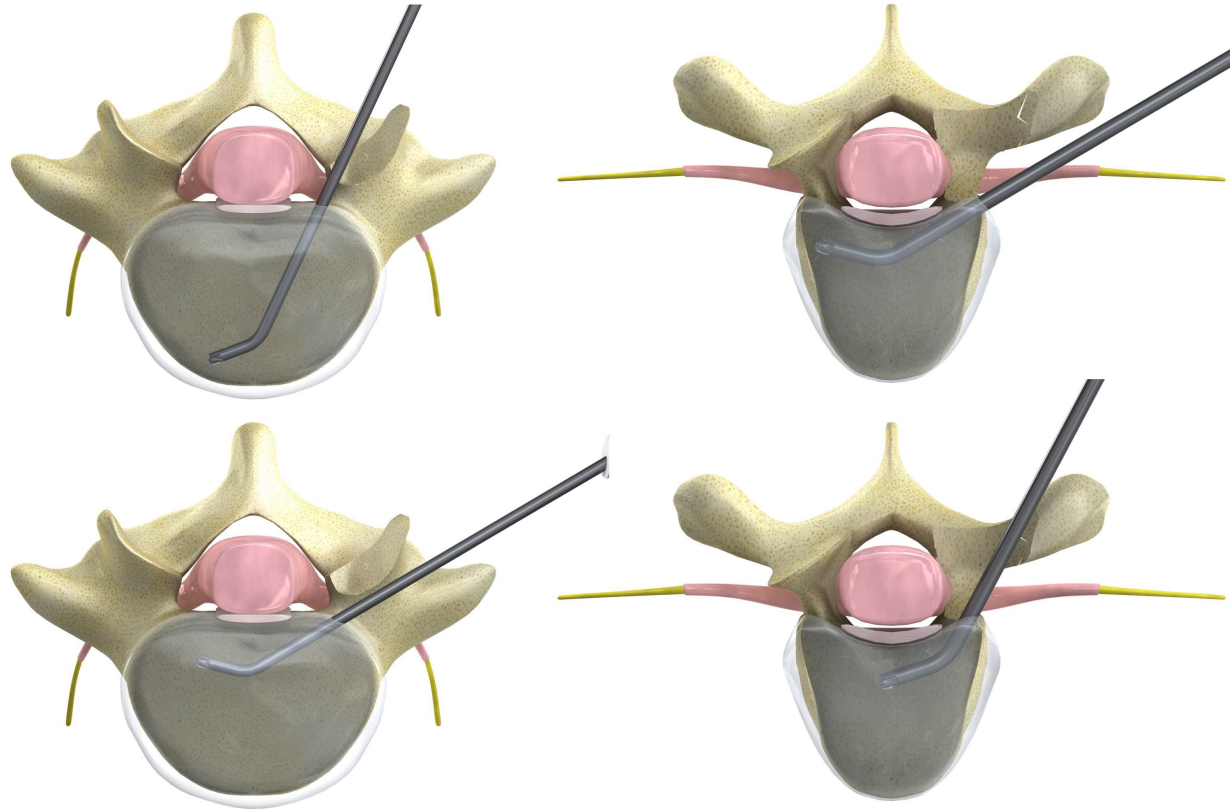
### Conclusions

The suggested TLIF approach allows for a safe, shorter procedure.

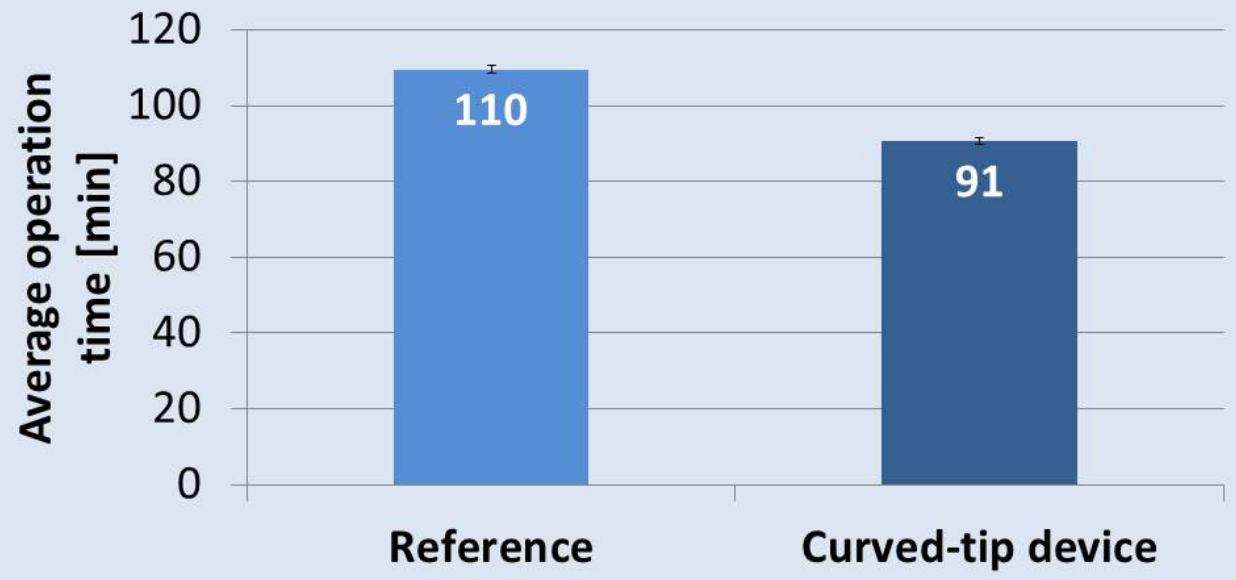
The curved-tip drill-like device (bottom) and expanded view of the distal tip (top)



Examples of device use during lumbar (left) and thoracic (right) procedures



**Average operation time**



**Average blood loss**

