

Unilateral vs. Bilateral Posterior Lumbar Interbody Fusion Advantages and limitations of interbody space restoration

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Unilateral vs. bilateral



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Unilateral vs. bilateral

Introduction

- For an interbody fusion, the following actions contribute to neurological decompression:
- Restoration of disc space height
 - Sagittal and coronal balance
 - Reduction of a slip

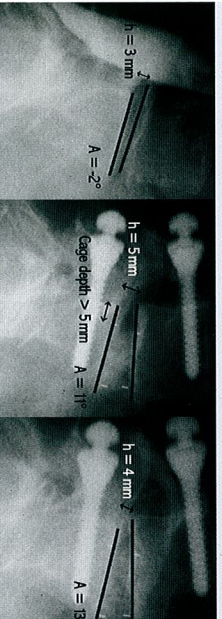
This study compared at pre-op, post-op and one year the various parameters that influence the result obtained, in particular:

- Interspace height before surgery
- The quality of the vertebral end plates
- The positioning of the impacted cages
- The effect of the lordosis created by the construct

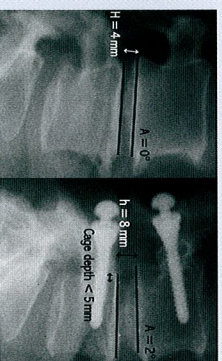
Materials & Methods

The above parameters were compared pre-op, immediate post-op and at one-year for a TLF and PLIF series: TLF 152 patients 193 levels from 1997 to 2003 (173 levels > 1 year/20 levels < 1 year), PLIF 73 levels 56 patients 1992 to 1996 (73 levels > than 1 year). Both series were performed by the same surgeon. In the TLF series, the cages were ostarPek® composite cages filled with iliac crest autograft, 23 mm in a/p, 5° lordosis angulation, allowing placement in the anterior aspect of the disc space. All TLF patients had unilateral or bilateral pedicle fixation, in either complete titanium or titanium screws and ostarPek® plates*. All PLIF patients had titanium pedicle fixation.

Example failed back

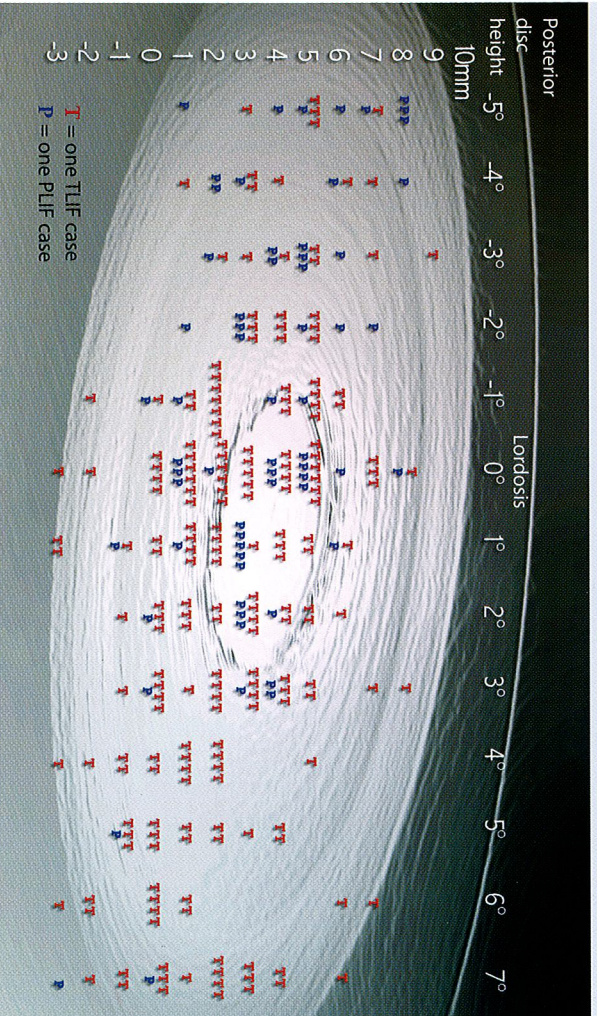


Case 1, anterior cage placement in the interspace with good lordosis (+13°), moderate restoration of the posterior disc space height (+2 mm)



Case 2, posterior cage placement in the interspace with moderate lordosis (+2°), important restoration of the posterior disc space height (+3 mm)

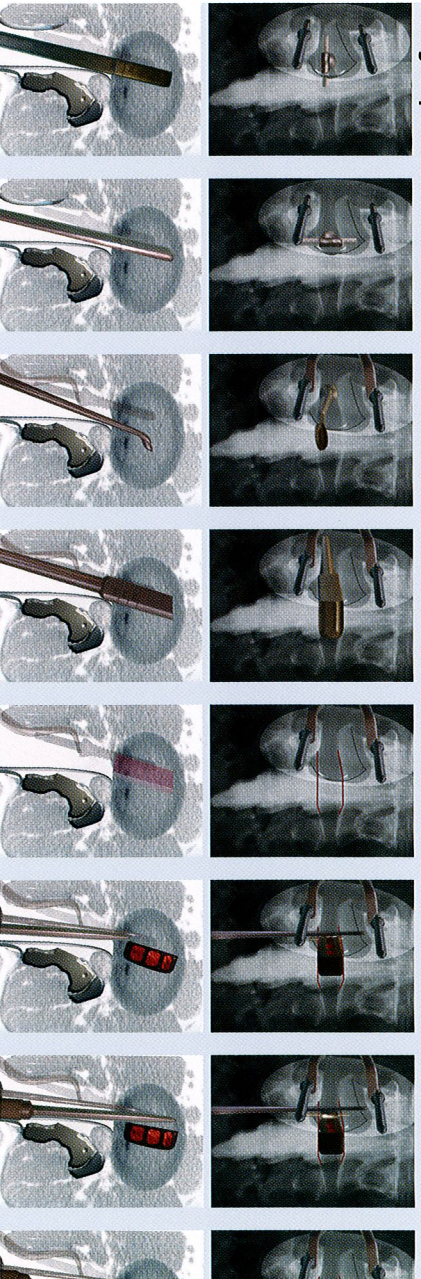
Unilateral vs. bilateral Change in lordosis and posterior disc height



T = one TLF case
P = one PLIF case

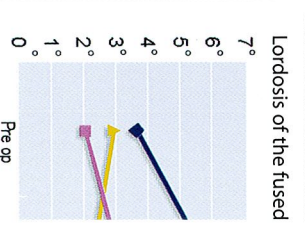
In spite of the varied outcome, the TLF series provided better lordosis and a more moderate restoration of the posterior disc height than PLIF.

Surgical procedure

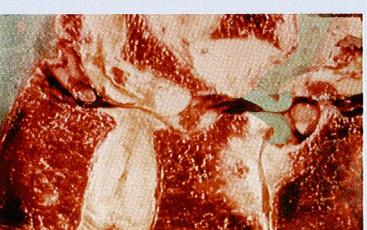


Pedicle fixation: Titanium screws and ostarPek plate*

Evolution lordosis and



At one-year follow-up no Three of 173 TLF cases st



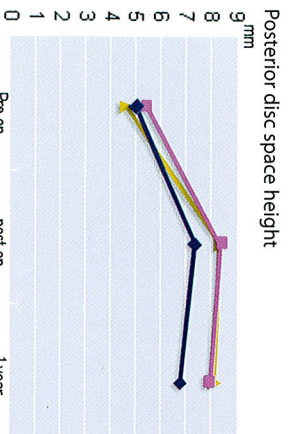
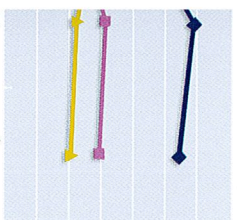
Graphic diagram based upon

Conclusions

Comparison of the series showed that the unilateral approach achieves a correction and biomechanical construct which is either comparable or an improvement over the PLIF technique. There are limitations to the unilateral technique, notably with osteoporosis, which have led the author to technical refinements. More study with longer follow-up is required.

sc height

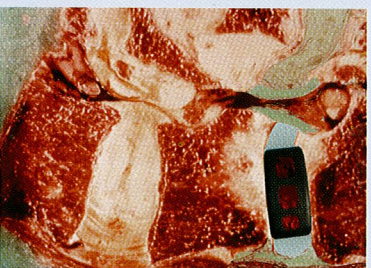
gment



ost op
: anteriorly placed: 76
posteriorly placed: 97

Pre op
post op
1 year
TLIIF with cages anteriorly placed: 76
TLIIF with cages posteriorly placed: 97
PLIF: 73

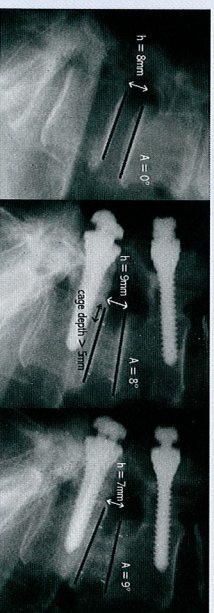
ision was observed in 2/73 cases in the PLIF series and 2/173 cases in the TLIIF series. ed a slight retropulsion of the second cage. These were non-symptomatic.



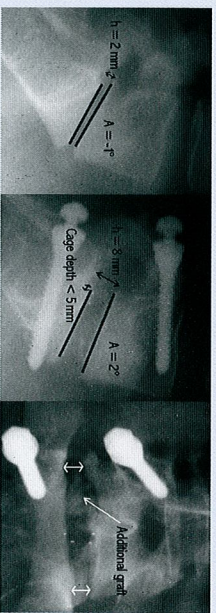
tomical slide from Prof. W. Rauschnig

The TLIIF achieved better lordosis than PLIF. Most likely this was achieved by the first cage that is translated to the contra-lateral and anterior portion of the interspace. The lateral translation of the cage, coupled with the intact posterior elements (the side opposite the surgical approach), along the posterior longitudinal ligament and annulus fibrosus, form a wedge effect similar to ligamentotaxis. These together achieve lordosis.

With the wedge effect, nerve root decompression is achieved for both sides, not only the side of the surgical approach, but also the contra lateral side.



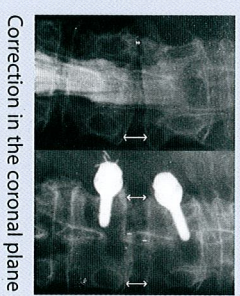
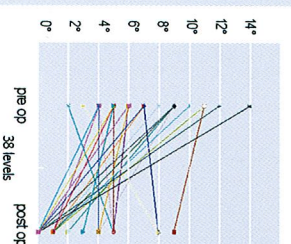
Degenerative spondylolisthesis with thick disc, cage placement anterior in the interspace with good lordosis (+ 8°), interspace height preserved



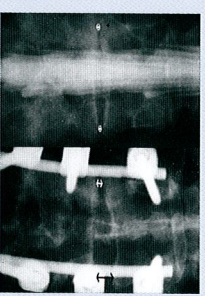
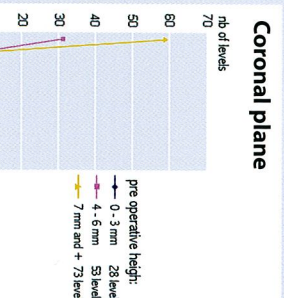
Failed back with thin disc, TLIIF with unilateral ostarPeK® plate, preservation of the coronal balance

Coronal plane

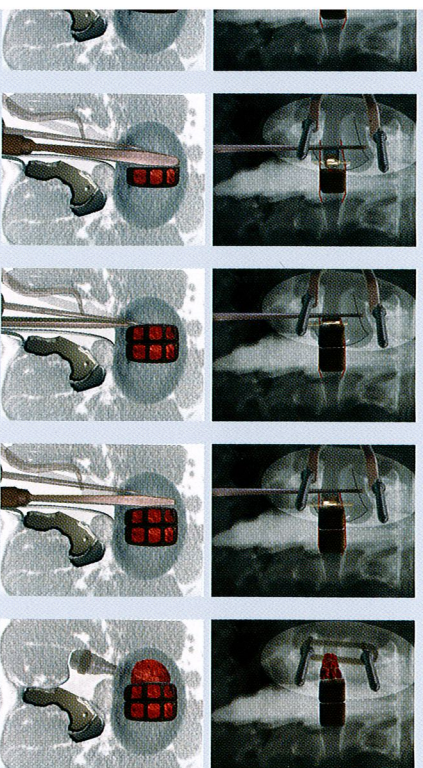
Approach from the collapsed portion of the disc & correction coronal plan



Correction in the coronal plane



TLIF limitations: Thin interspace height with osteoporosis = risk of coronal imbalance



* Long fiber carbon/PEKEKK composite colligene AG
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