

# Transposas Lumbar Fusion

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## Ideal indication- degenerative spondy

- ▶ Herkowitz (1991) classic article
  - ▶ Patients with degenerative spondylolisthesis clinically do better if fused
- ▶ Follow up studies indicated that status of fusion correlated with clinical outcomes
  - ▶ Better fusion, better long term outcomes
- ▶ General trend in literature
  - ▶ Inclusion of interbody improves fusion rate compared to posterior only

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## Board answer- degenerative spondy

- ▶ Decompression
- ▶ Fusion
  - ▶ +/- instrumentation
- ▶ Local bone graft
- ▶ Iliac crest bone graft
  - ▶ Up to 30% rate of donor site morbidity
- ▶ But what are the outcomes?

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### SPORT Trial

- ▶ RTC with ITT and as-treated subgroups
- ▶ In summary
  - ▶ Surgical patients did better (73% instrumented: 21% in situ)
  - ▶ This was evident by 6 weeks and maintained out past 4 years
  - ▶ 89% of patients had no surgical complication
  - ▶ 2 year f/u: only 3% ASD requiring further surgery

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### However...

- ▶ 5% infections
- ▶ 11% dural tears
- ▶ 16% post-operative transfusion
- ▶ 600 cc EBL
- ▶ 15% reoperation rate at 4 years
- ▶ Some of these can be lowered with MIS

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### Not just DS

- ▶ Indications include
  - ▶ Isthmic spondylolisthesis
  - ▶ DDD
  - ▶ Scoliosis
  - ▶ ASD
  - ▶ Central stenosis??

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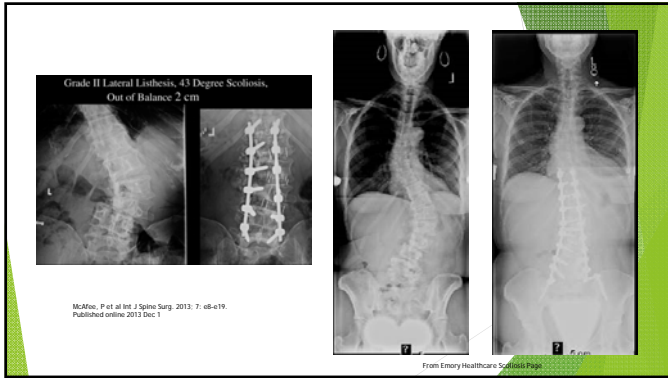
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### Scoliosis

- ▶ Phillips (2013)
  - ▶ 107 patients with degenerative scoliosis
  - ▶ 4.4 levels fused per patient
  - ▶ EBL less than 100 cc in 62.5% of patients
  - ▶ EBL >300 cc in 9 patients
  - ▶ 5% transfusion rate
  - ▶ Fusion rate 90%
  - ▶ 3 infections (all with posterior instrumentation)
  - ▶ 34% transient weakness
    - ▶ 5% permanent (4/5 grade in 4 patients)

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### Can't leave Neel (2013) out of this discussion

- ▶ More heterogeneous data than Phillips
- ▶ 71 patients with scol (54 degenerative) treated with trans sacral fixation, direct lateral, and perc screws
- ▶ Mean f/u 39 months
- ▶ Coronal and sagittal correction around 60%
- ▶ EBL around 400 cc in total
- ▶ 2 infections (3%)
- ▶ Similar results found by Tormenti (2010) with TLIF/Lateral deformity correction; McAfee 2013 with laterals/osteotomies
- ▶ Overall literature scant

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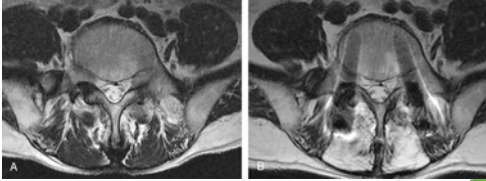
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### Back to the question: Why lateral?

- ▶ Atrophic multifidus= back pain
- ▶ Mechanically dysfunctional muscles are not compensated for with hardware



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### Lateral surgery is safe

- ▶ Rodgers (2010)
- ▶ 600 patients treated (370 women/230 men)
- ▶ 1-4 levels; 60% included L4-5
- ▶ 1.2 day hospital stay
- ▶ No infections
- ▶ No vascular injuries
- ▶ No epidural hematoma
- ▶ <1% transient neuro deficits
- ▶ No dural tears

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### Comparison to other approaches

- ▶ ALIF- very low (1% or less) infection
- ▶ TLIF infection
  - ▶ 2-3% MIS
  - ▶ 3-4% open
- ▶ Open PSF- up to 10%
  - ▶ 5% SPORT
  - ▶ Prior to use of local abx

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### Remember other approach related complications

- ▶ PSF motor injury 2-3%
- ▶ TLIF motor injury 3-4%
- ▶ PLIF motor injury 5-6%
- ▶ ALIF motor injury 1%
  
- ▶ Length of stay 3-4 days for open cases
  - ▶ 1-2 days with lateral

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### Limiting nerve distraction

- ▶ Interbody placement improves fusion rates in many studies
  - ▶ Question of whether this improves clinical outcomes
  - ▶ Kornblum...
- ▶ Direct nerve trauma can occur with nerve distraction
  - ▶ Humphreys (2001)
    - ▶ 40 patients treated with 1-2 level TLIF and no neuro complications
    - ▶ 34 patients treated with PLIF: 4 (12%) radiculitis
  - ▶ Also
    - ▶ 5 day hospital stays
    - ▶ Blood loss > 300 (nearly 700 cc in 2 level PLIF)

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### Lateral surgery is effective in spondy

- ▶ Indirect decompression works
  - ▶ Olivera (2010)
    - ▶ 21 patients with Grade I-II spondy and/or degen scoliosis
    - ▶ All treated with stand alone lateral interbody
    - ▶ Foraminal diameter increased by 25%
    - ▶ Central diameter increased by 33%
    - ▶ 90% success; no major complications
  - ▶ 2 revisions/decompressions
    - ▶ One with posterior hardware not previously removed
    - ▶ Second with early subsidence

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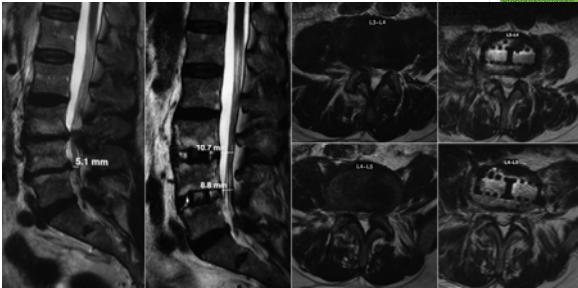
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### Olivera



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### Clinical outcomes

- ▶ Sembrano (2016)
- ▶ 29 patients with degenerative spondy treated with XLIF
- ▶ 73% improvement in back pain
- ▶ 79% improvement in leg pain
- ▶ One transient motor injury (4/5 Quad; resolved)
- ▶ 100% fusion rate at 2 years
- ▶ 2 day average hospital stay

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### Outcomes

- ▶ Khajavi (2015)
- ▶ 60 spondy patients treated with indirect decompression
  - ▶ 43% also decompressed posteriorly
- ▶ Disc height increased 71%
- ▶ Slip reduced >60%
- ▶ Foraminal height and width both increased >18%
  - ▶ Open decompression probably why central area not described in the paper
- ▶ Substantial clinical benefit seen in greater almost 95% of patients

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### Stand alone

- ▶ Marchi (2012)
- ▶ 52 patients with grade I/II slips treated with indirect decompression
  - ▶ No screws
- ▶ VAS back/leg and Oswestry improved by 60/50%
- ▶ However, 17% subsided
  - ▶ 13% revision surgery
  - ▶ Consistent with other studies favoring posterior instrumentation

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### Indirect and Perc screws

- ▶ Ahmadian (2013)
- ▶ 31 consecutive patients with Grade I and II slips
- ▶ All decompressed posteriorly only
- ▶ No motor injuries
- ▶ ODI decreased from 60-40
- ▶ VAS decreased from 70-38.7
- ▶ SF-36 significantly improved as well

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### Indirect Decompression and instrumentation

- ▶ Rodgers (2012)
- ▶ "Worst case scenario:" L4-5 Grade II slips
- ▶ 63 patients followed for 12 months (61/63 at L4-5)
- ▶ Indirect decompression and screws only
- ▶ VAS decreased from 8.7-2.2
- ▶ No neural injuries
- ▶ 100% fusion rate
- ▶ Transient upper thigh pain and HF weakness not considered neuro injuries

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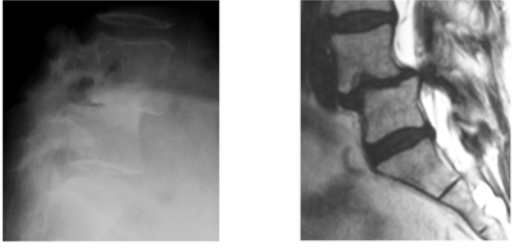
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Rodgers



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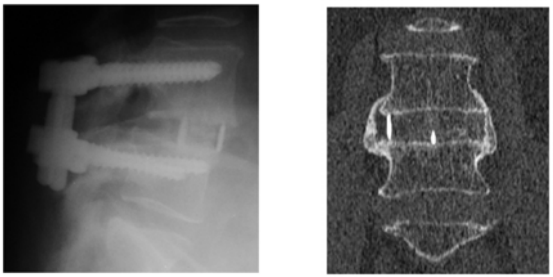
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Rogers



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In conclusion

- ▶ Lateral interbody fusion is superior to open surgery
- ▶ Direct decompression is usually unnecessary
- ▶ Clinical outcome studies are beginning to appear in the literature

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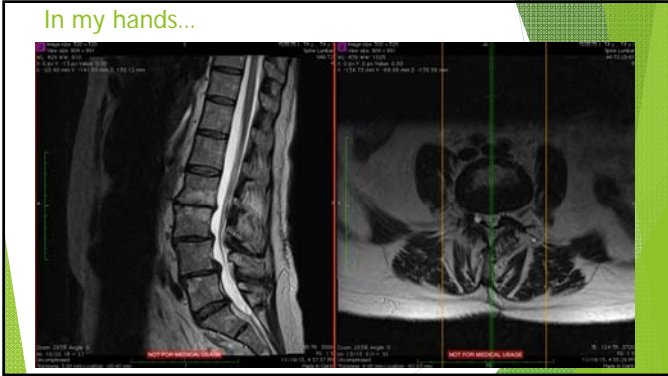
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In my hands...



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Go lateral!!!



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