

The Role For Hyperlordotic Implants

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Disclosures

- ◇ Consultant
 - ◇ Innovasis
 - ◇ Medacta
 - ◇ Silony Spine
 - ◇ K2M
- ◇ Royalties
 - ◇ Innovasis
 - ◇ K2M

Hyperlordotic Implants

- ◇ ANTERIOR

- ◇ Most common



- ◇ LATERAL

- ◇ With our without ALL release



- ◇ POSTERIOR



Advantages

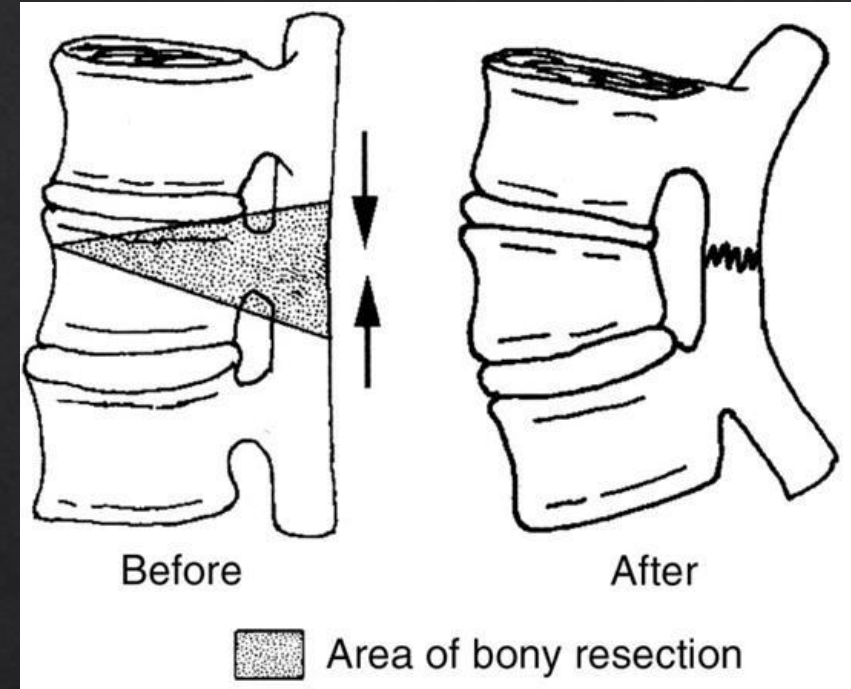
- ◇ Significantly improve lordosis with surgery at 1-2 segments
- ◇ Avoid morbidity of PSO
- ◇ Better match native anatomy

Disadvantages

- ◇ Assuming the implant will do all the work for you
- ◇ Edge loading → SUBSIDENCE
- ◇ Applicability without ALL release in lateral

PSO

- ◆ Complication rate up to 58%
- ◆ EBL 1.1L/level
- ◆ 11% Neurological complication rate
- ◆ Pseudarthrosis



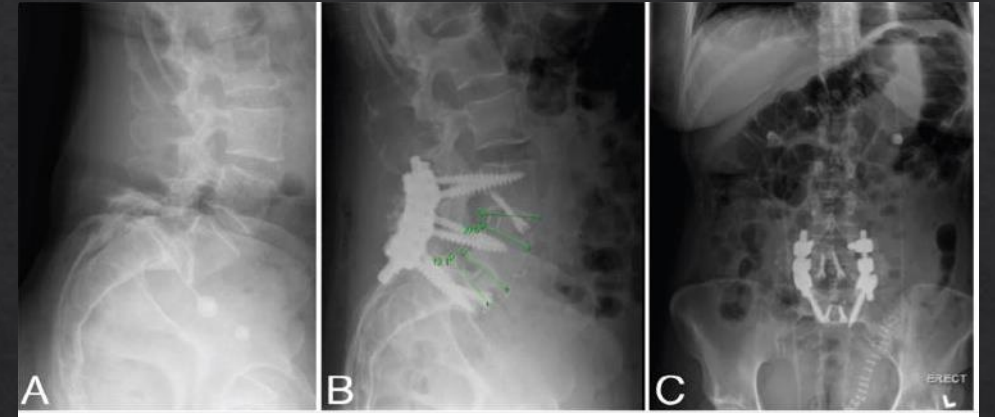
Anterior hyperlordotic cages: early experience and radiographic results

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ALIF

- ◇ Most common indication in my hands
- ◇ **60-80%** of lordosis originates from L4-S1
 - ◇ (Vialle R JBJS Am 2005)
- ◇ Match lordosis (especially L4-S1) if alignment normal
 - ◇ 20 and 30 degree cages can produce segmental lordosis almost as much as the cage measurement
- ◇ Improve lordosis with or without without posterior osteotomy
 - ◇ (Saville PA JNS 2016)
- ◇ Significantly improve lordosis with osteotomy
- ◇ Technical Note: Fixate to ONE vertebra



Lateral

◇ Without ALL Release

- ◇ Match lordosis (maybe improve slightly)
 - ◇ Very lordotic L4-5 above collapsed L5-S1
- ◇ Osteotomy necessary if you want to make a big change

◇ With ALL release

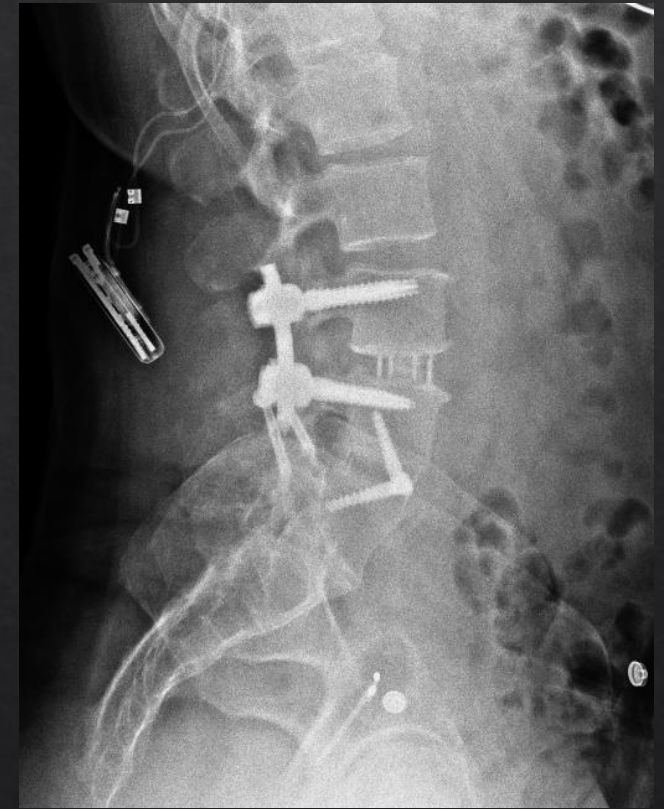
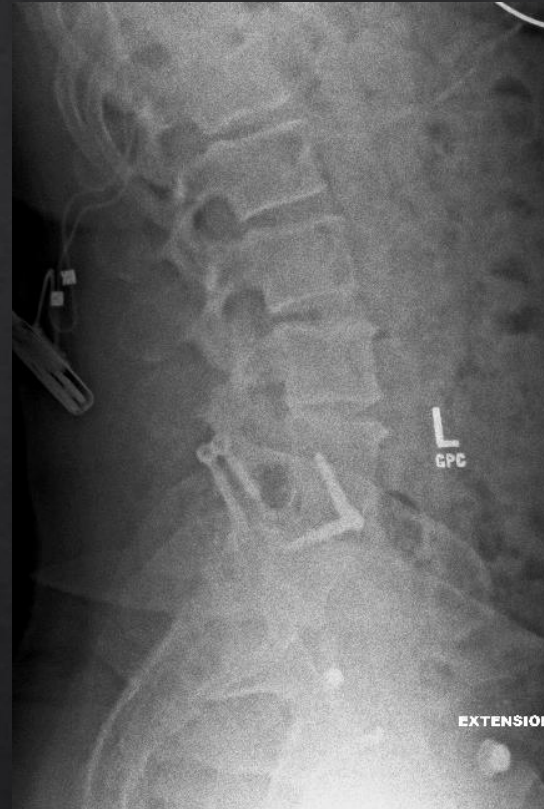
- ◇ Opportunity to significantly increase lordosis
- ◇ Technically demanding
- ◇ There is risk
- ◇ Likely need posterior osteotomy for full effect

Do Hyperlordotic Lateral Cages Work?

- ◇ 10 degree cages increased segmental lordosis 2.8 degrees but no effect on overall lordosis
 - ◇ (Sembrano JN et al Clin Spi)
- ◇ DLIF improves segmental lordosis at level treated but no effect on overall sagittal alignment
 - ◇ (Acosta FL et al JNS 2011)
- ◇ “XLIF did not change overall lumbar lordosis or significantly alter pelvic indices associated with sagittal balance”
 - ◇ (Johnson RD et al J Clin Neurosci 2013)
- ◇ “The mean maximum increase in segmental lordosis of 11.6° followed ALL release and placement of the 30° cage.”
 - ◇ (Uribe SA et al JNS 2012) – cadaveric study

My experience with lateral

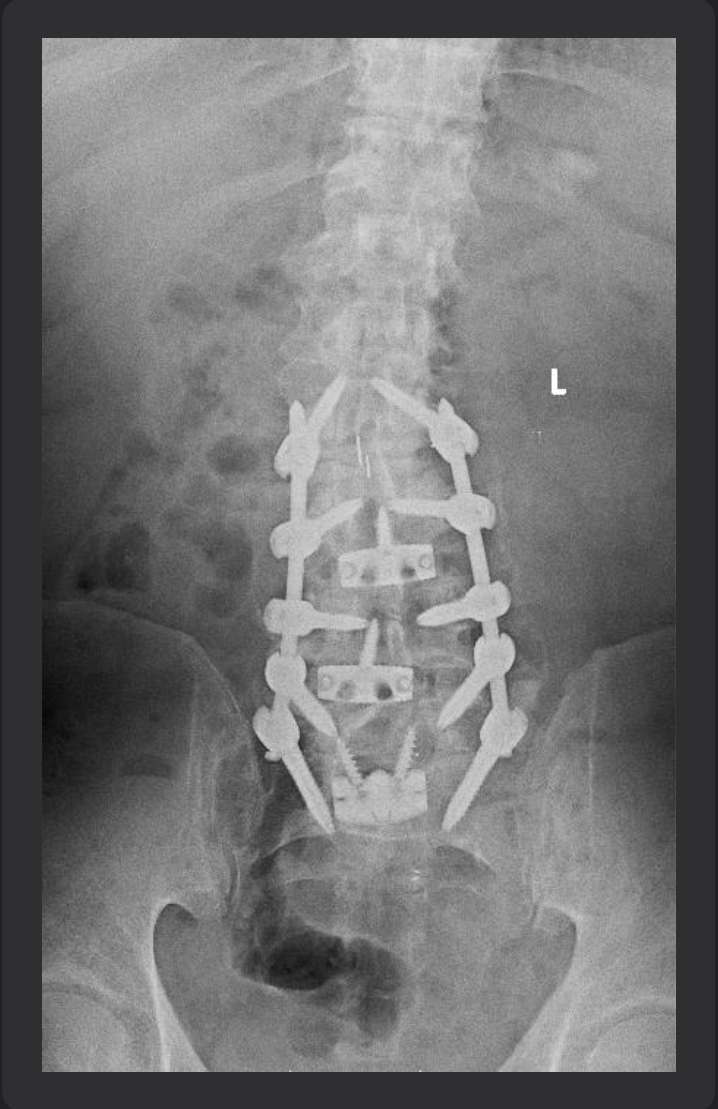
- ◆ Important not to lose lordosis (lordotic L4-5 disc above collapsed 5-1 level)
- ◆ I don't think very lordotic implants create significant lordosis without ALL release or posterior osteotomy
- ◆ Get the implant anterior for more lordosis

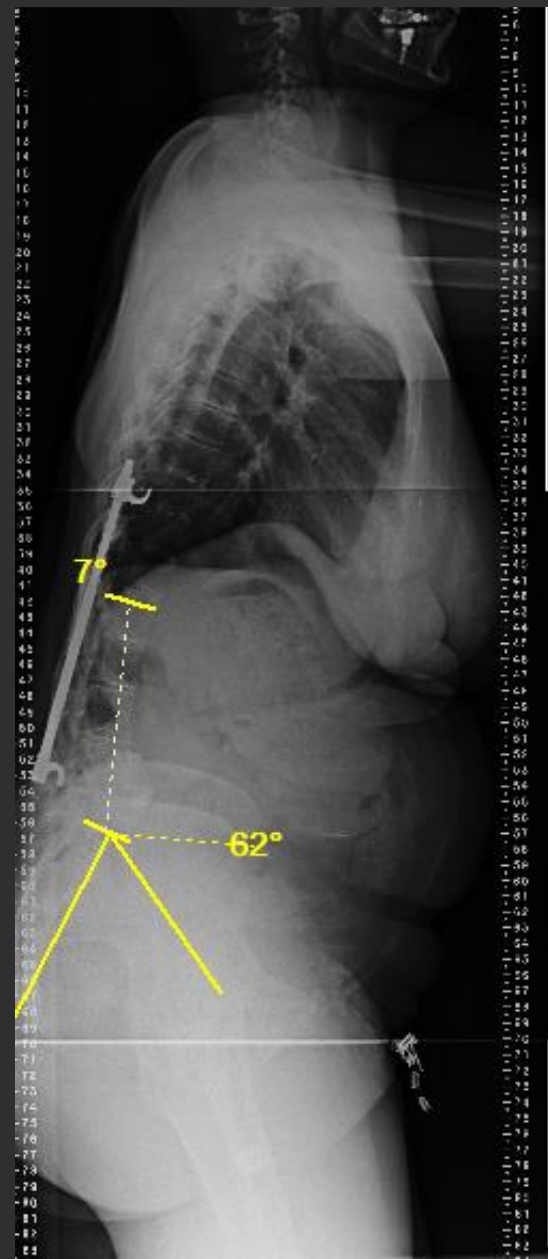


TLIF/PLIF

- ◇ TLIF's CAN improve lordosis
- ◇ Best when combined with posterior osteotomy (~10 degrees per level)
- ◇ Hyperlordotic TLIF without posterior osteotomy?
 - ◇ Not a lot out there
- ◇ No difference in segmental or lumbar lordosis between lordotic expandable and static cages
 - ◇ Yee TJ Neurosurgery 2017







Harrington Rod fused to L4

PSO?





Final Thoughts

- ◇ ALIF works best
- ◇ Lateral: easy to overdo it, match lordosis.
 - ◇ For bigger corrections, posterior osteotomy and/or ALL release
- ◇ Posterior release is important if significant gain in lordosis is your goal
- ◇ TLIF: HL cages may better match native lordosis. Facet resection osteotomy likely needed to realize significant gains in lordosis
- ◇ Be careful about edge loading, especially in osteoporotics