

EXPANDABLE TECHNOLOGIES: A SURGEONS POINT OF VIEW

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Introduction

- Who am I?
- Fellows Course



- It's 2024 and this is the 24th time Globus have asked me to teach!
- My experience with Thoracolumbar Expandables – interbody and corpectomy cages:
 - RISE, RISE L, ELSA, EXPAND, FORTIFY, XCORE

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Spinal Surgery

- Decompression
 - Spinal cord / nerve roots
- Realignment
 - Correct deformity
- Stabilization
 - Prevent / Treat
 - Neurological deficit / deformity / pain
 - (Non fusion technology form of "stabilization")

All may require fusion

Require Instrumentation

Instrumentation increases fusion

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Spinal Surgery

- What are you trying to achieve?

- Non-maleficence - "first, do no harm" (primum non nocere).

- DO THE APPROPRIATE OPERATION FOR THE PATIENT AND THEIR PATHOLOGY AND YOUR SKILL / ABILITY

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Patient Selection

- What does the patient want?
- What is most appropriate for your patient?
- Surgical factors to consider Lumbar Surgery - ABC Approach:
 - Age Alignment Anatomy Access
 - Bone Quality
 - Compression – central / lateral / foraminal
 - Disc Height / Degeneration / Deformity / Dura
 - Evaluate Stability – supine / erect / dynamic
 - Facet Orientation / Gap
 - (Globus kit!!!)
 - How many operations?...

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Patient Selection

- The 3Ps
 - Patient / Pathology / Practitioner
- Address patient Ideas / Concerns and Expectations (ICE)
- Have an algorithm / use best evidence
- Start with simple cases
- Practice "open" / go on courses
 - practice over the top decompressions from same side when doing simple decompressions

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Interbody Fusion

- Is an interbody fusion required?
 - Restore foraminal height (up / down)
 - Improve fusion potential
 - Revision of failed posterolateral fusion
 - Restore lordosis / correct deformity
 - Biomechanics – shear / large disc height / entire facet removed / long construct involving L5/S1
- Types:
 - Auto / allograft
 - Threaded / Cylindrical cages
 - Banana cages
 - Oblique cages
 - Articulated cages
 - Expandable cages

DO YOU NEED TO FUSE AT ALL OR WILL A DECOMPRESSION ALONE SUFFICE?

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Considerations TLIF

- All lumbar levels
- Restore foraminal height (up / down) ☒
- Improve fusion potential ☒
- Revision of failed posterolateral fusion ☒
- Restore lordosis / correct deformity ☒
- Biomechanics – shear / large disc height / entire facet removed / long construct involving L5/S1 ☒

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Considerations LLIF

- All lumbar levels – except L5/S1
- Restore foraminal height (up / down) ☒
- Improve fusion potential ☒
- Revision of failed posterolateral fusion ☒
- Restore lordosis / correct deformity ☒
- Biomechanics – shear / large disc height / entire facet removed / long construct ☒

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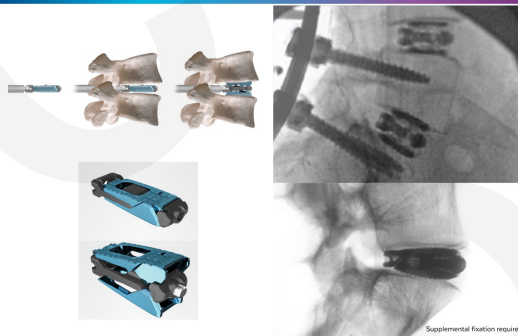


Real Purpose of Surgery



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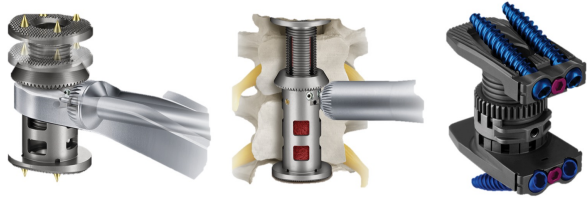
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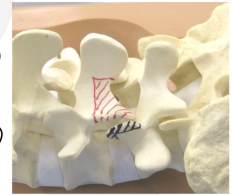
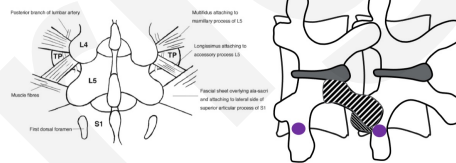


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Anatomy Approaches - TLIF

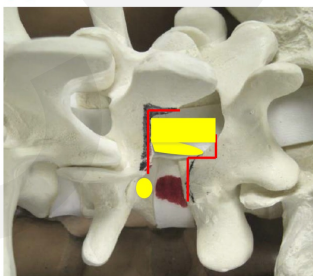


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Anatomy Approaches - TLIF

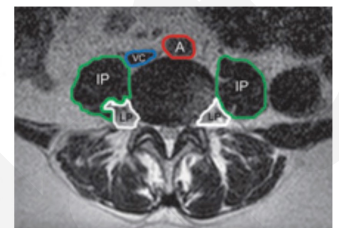
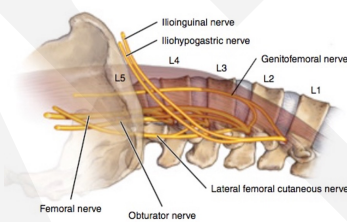


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Anatomy Approaches - LLIF



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Anatomy Approaches - LLIF



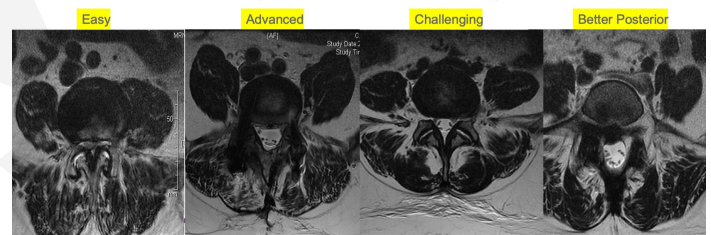
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Anatomy Approaches – LLIF / ATP

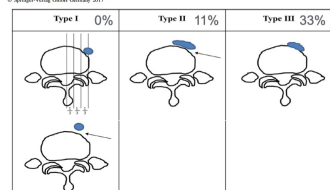
- Access Window – Psoas size, position – Vascular – Vertebral Rotation - etc.
- Rationale – Alternatives (ALIF, Lateral, TLIF, Posterior)?



Preoperative evaluation of left common iliac vein in oblique lateral interbody fusion at L5-S1

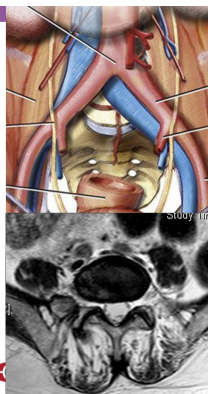
Nam-Se Chung¹, Chang-Hoon Joo², Han-Dong Lee³, Hoon-Ju Kwon⁴

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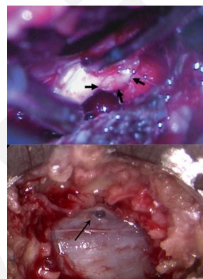


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TLIF Limitations

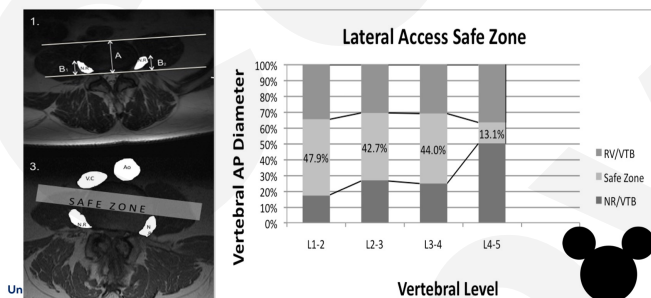


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LLIF Limitations



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WHAT DO I EXPECT FROM YOU?...



Now, you just insert it above the flange and

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What Do I Expect From You?

- Be on time
- Be present at the sign in and time out
- Have a laser and lots of coffee / snacks!
- Check the kit and implants are all there prior to the patient being asleep
 - Inventory control and contingency plans
- Go through everything with the scrub nurse - support
- Go through everything with the surgeon – support (especially 1st ops / younger)
 - no matter how arrogant they are!
- Feedback to the Company to improve the equipment

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General Tips

- BE AN EMOTIONAL SUPPORT REP!
- “PERHAPS YOU CAN TRY THIS...”
- NEVER EVER SAY “DR / MR / MISS X DOES IT THIS WAY...”
- MASSAGE THE EGO “THAT WENT WELL...”

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Why Do I Use Expandable Cages*?

- I have done >100 expandable cages
- Minimize tissue trauma during insertion
- Minimize neural retraction
- Minimize endplate trauma during insertion
- Minimize implant subsidence (gradual load sharing)
- Minimize cage back out
- Maintain lordosis with lordotic implant
- **Remember - my TLIF / LLIF / Corpectomy is not the same as others**
- **My endplate prep not the same as others**
- **What works in one person's hands does not necessarily work in another's**

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*Points on slide represent my opinions based on my clinical experience



Cases



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Case 1

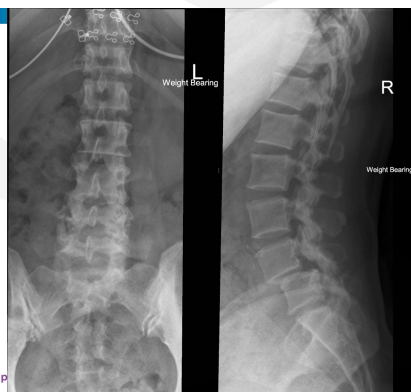
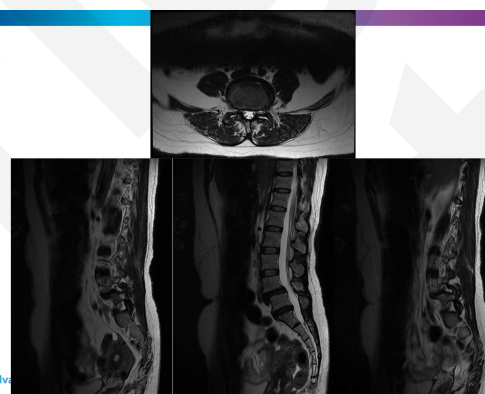
- 40-year-old female
- Stenotic Leg Symptoms > Low Back Pain
- Failed conservative management

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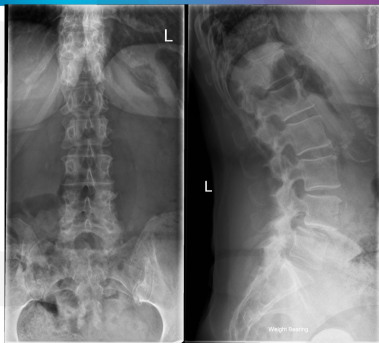
Case 2

- 50-year-old female
- Spinal claudication
- Right leg worse
- DDD L4/5, Spondylolisthesis with stenosis and instability

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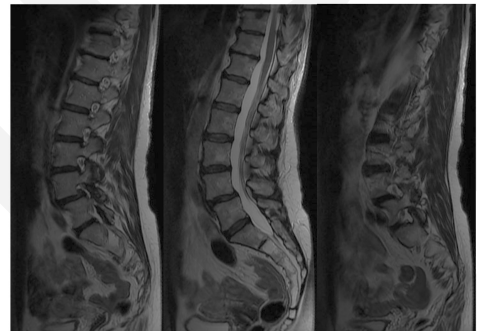
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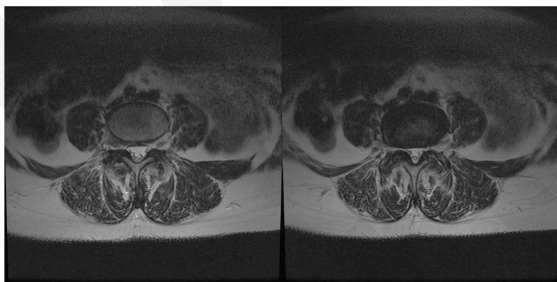
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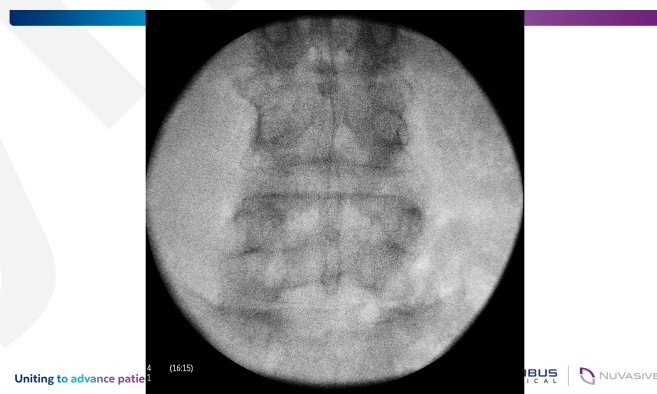
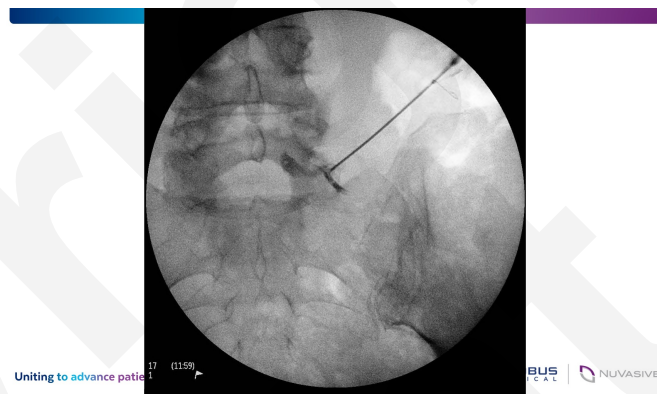
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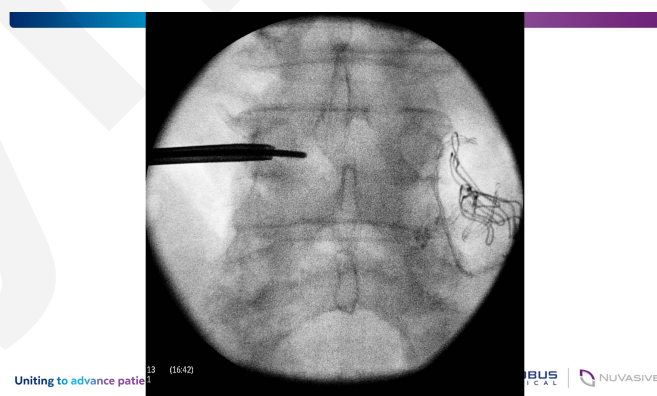
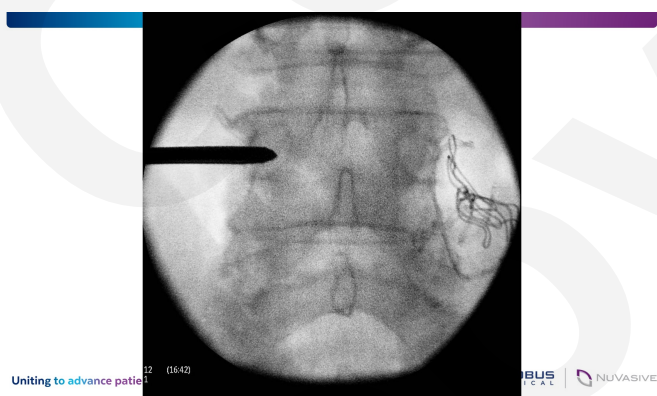
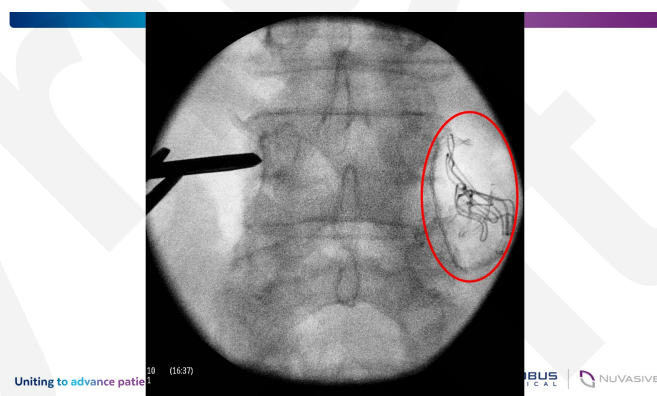


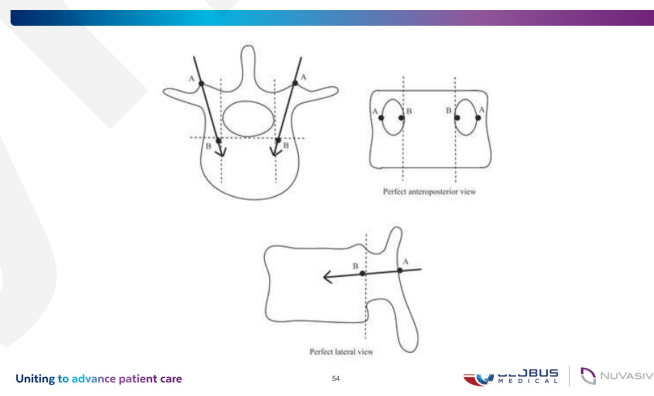
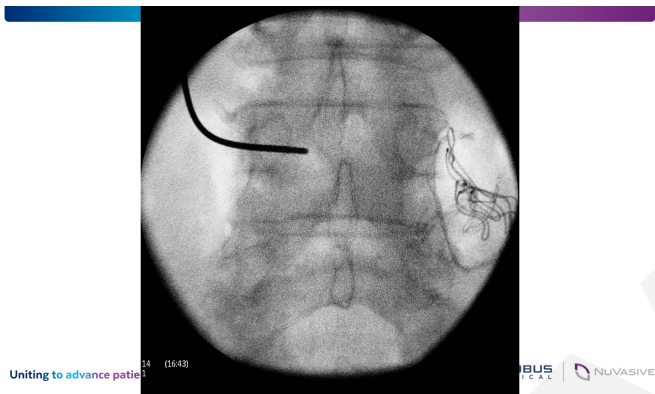
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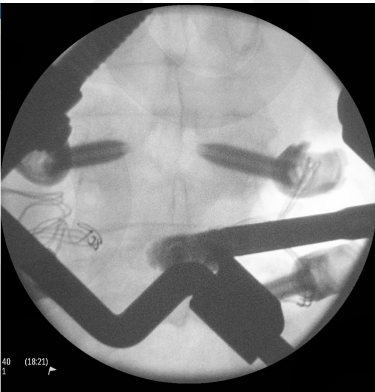


Grafting the Disc Space



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40 (1822)



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43 (1823)



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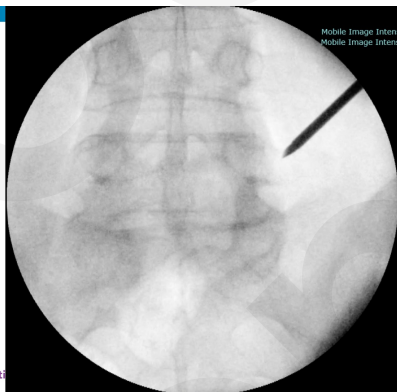
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Personal Experience Expandable TLIF

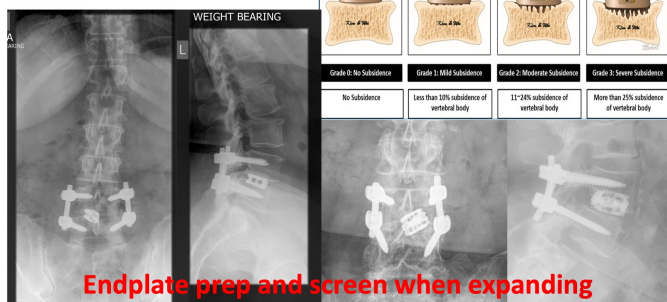
- RISE / Caliber TLIF and Rise L cages
 - Tend to use 12 x 30 x 15 deg RISE – whole facet comes off (ie a TLIF!)
 - MIS TLIF – 2 incision – adequate access
- No cage back outs
- No post op subsidence
 - Yes to intra op endplate damage and intra op subsidence
 - Yes to cage insertion nonparallel to endplates
- Yes to post op perineural inflammation
- No revisions...yet!
 - Adjacent segment surgery - yes of course!

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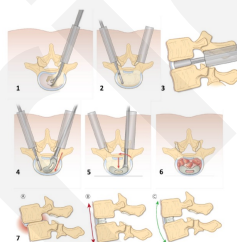
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Subsidence



TLIF and Lordosis / Subsidence



Bilateral facetectomies = can improve lordosis...

Unilateral facetectomy = beware subsidence...

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Endplate Prep

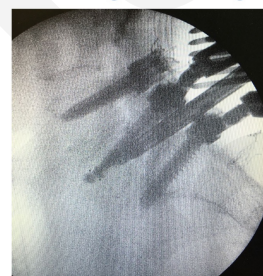


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Be Careful Inserting the Cage



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Cage Insertion

- TLIF - pack some graft in disc space first then reinsert a paddle to create space for cage
 - Use graft inserting device
- Watch the root / theca - +/- retract
- Ensure cage mounted properly and tight
- Check orientation parallel with disc space in all planes prior to insertion
- Screen before and during expansion
 - Helps avoid cage into endplate
 - The “click off” only protects the implant!

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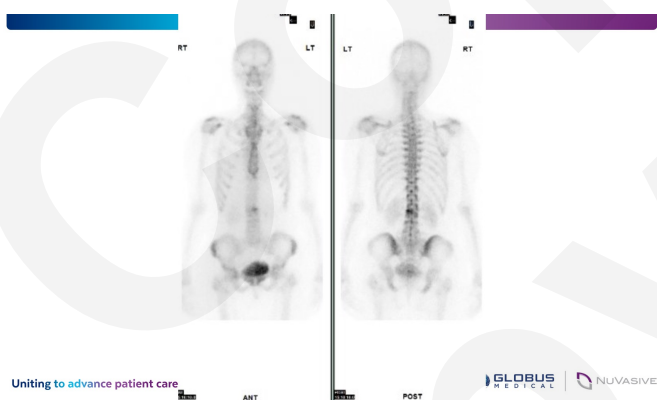
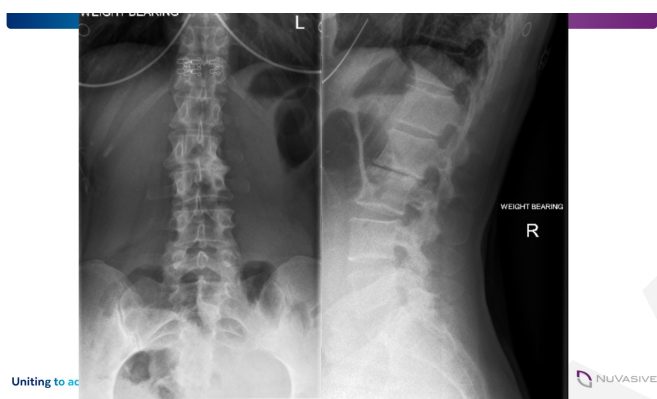
Case 3

- 40-year-old female
- 2 previous L2/3 discectomies for leg pain
- No complications
- Now has severe LBP and some leg pain

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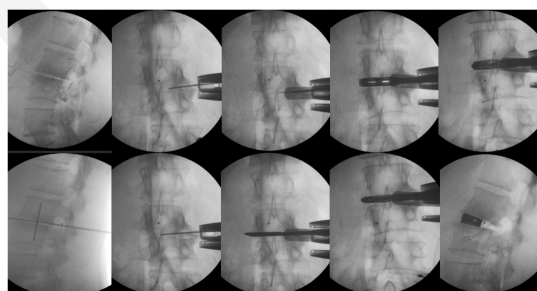
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Options?

- INTERBODY DEVICE TO ADDRESS PAIN SOURCE
 - Access into a shut down disc space...
- ALIF
 - Access surgeon (?) / specialist training - L2/3...
 - Good fusion footprint - Will require additional posterior surgery (?)
- LLIF
 - Specialist training (?)
 - Low risk to neural structures
 - Ribs might get in the way
 - Good fusion footprint - Will require additional posterior surgery (?)
- TLIF
 - Neuronal elements exposed – not necessarily required – already been there twice
 - Smaller fusion footprint
 - All in one approach – front and back addressed



L2/3 LLIF with Perc Posterior



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Avoid Endplate Damage

- Gouging the endplate...
- Be gentle with disc shavers / curettes
- "Feel" the endplate prep
- Avoid pts with osteoporosis
- Screen endplate prep if needs be



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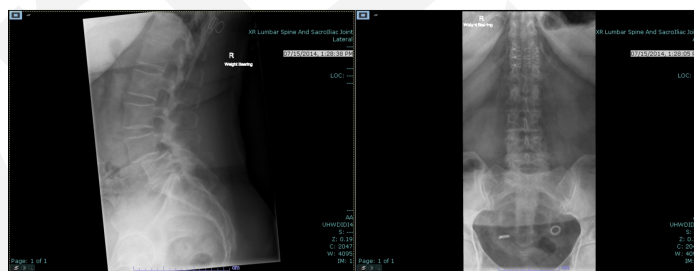


Case 4

- 60-year-old female
- Severe spinal claudication failed conservative management

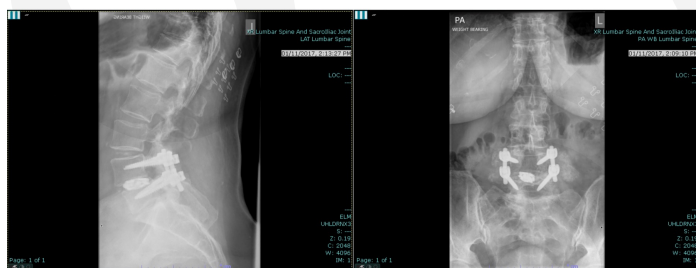
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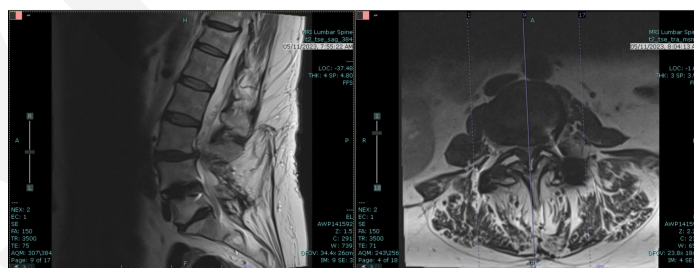
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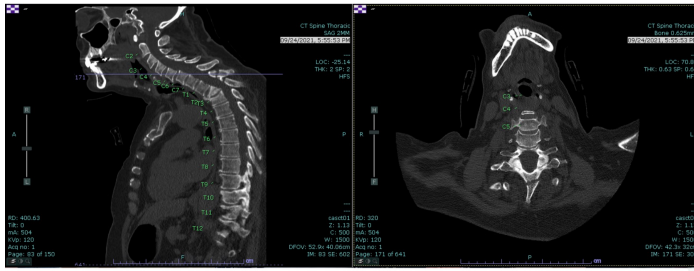
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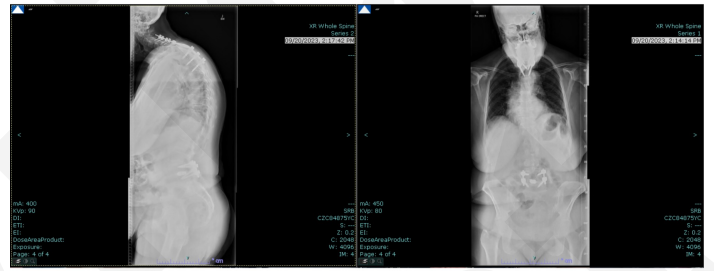
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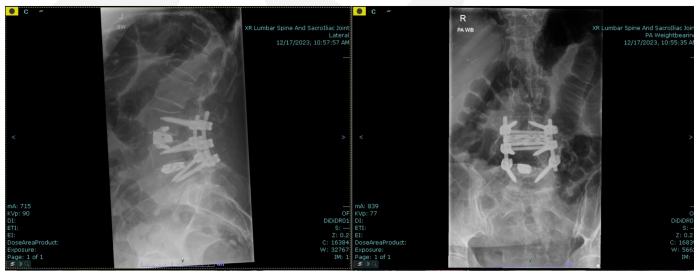
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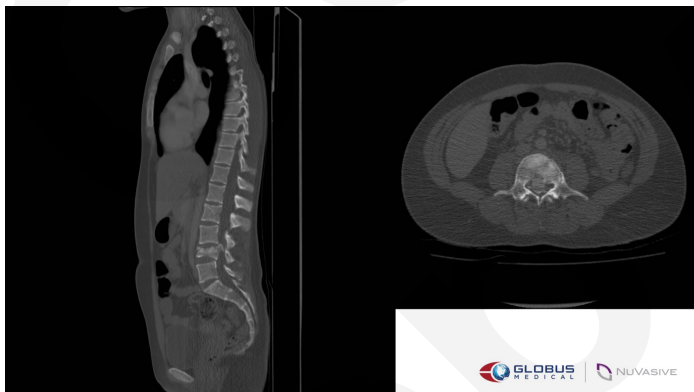


Case 5

- 30-year-old female
- MTC / RTC
- Severe low back pain and some altered sensation in thigh

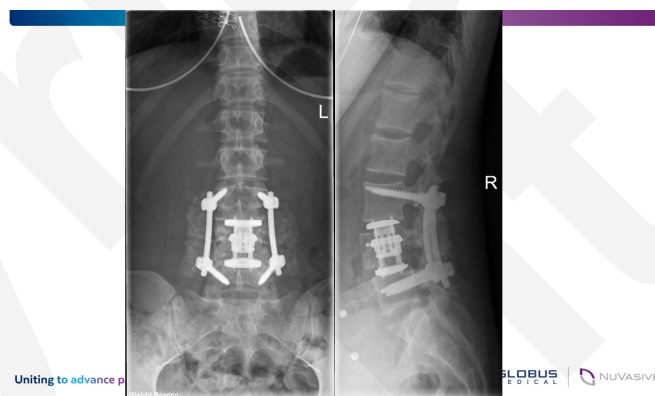
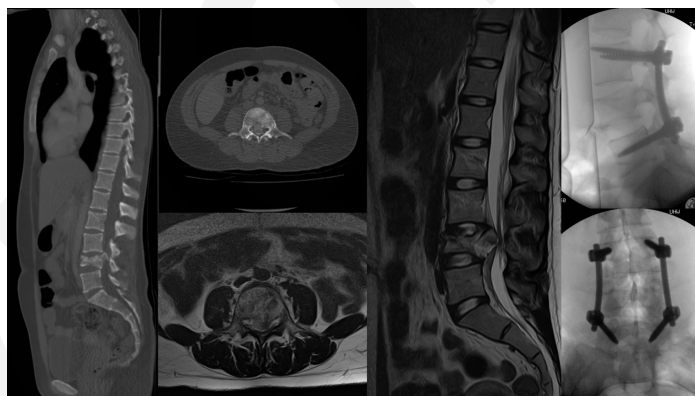
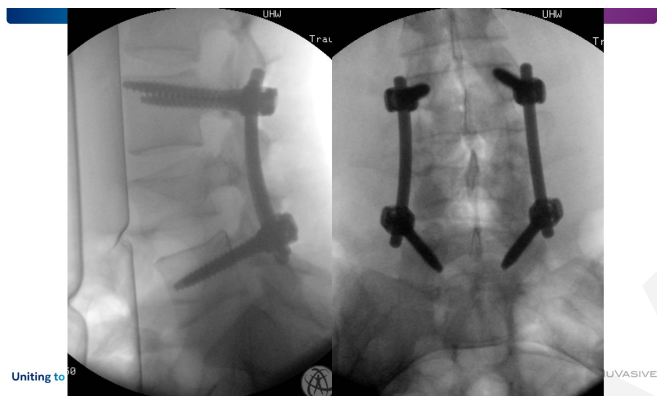
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Case 6

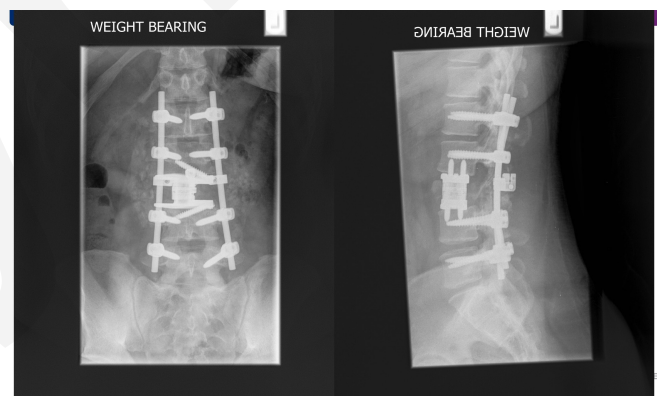
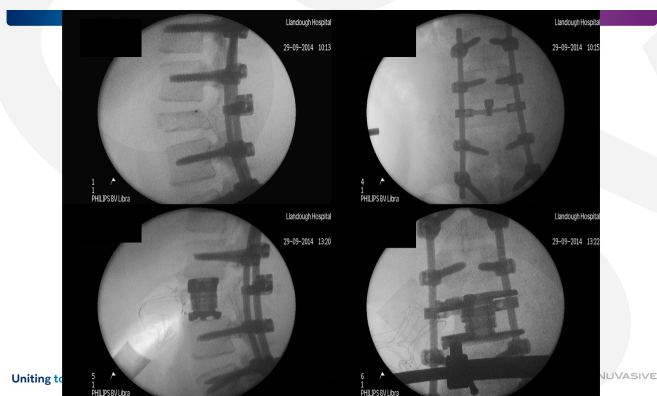
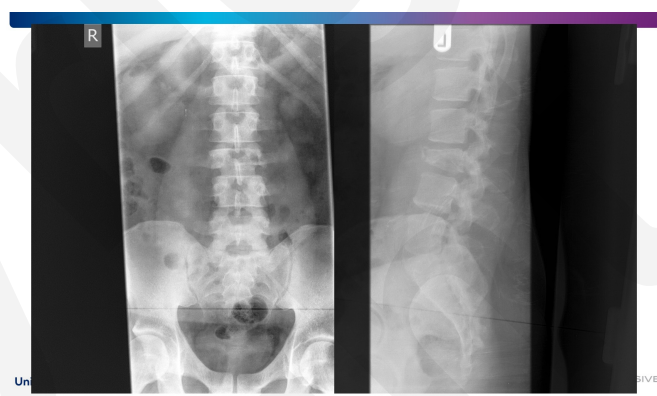
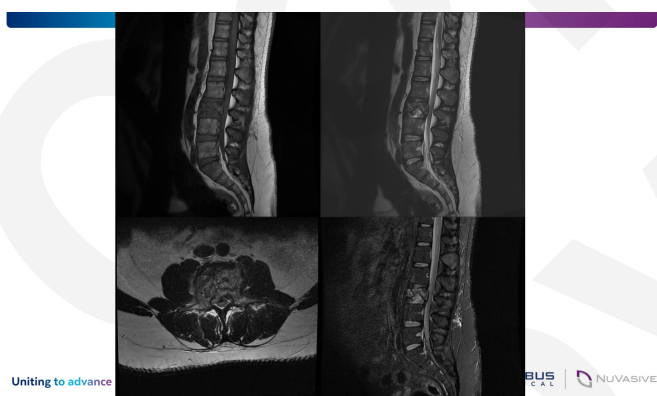
- 35-year-old male
- Severe low back pain
- No neurological deficits



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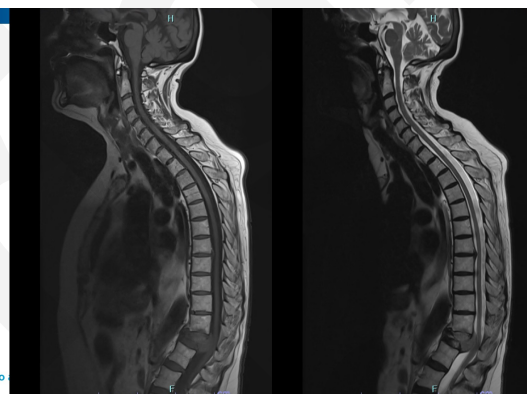


Case 7

- 65-year-old female
- Known renal cancer
- Going off legs

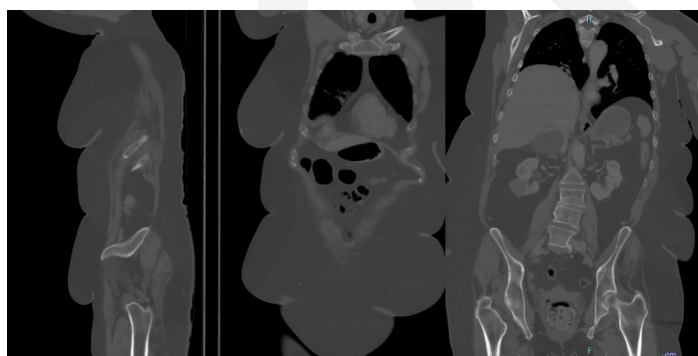
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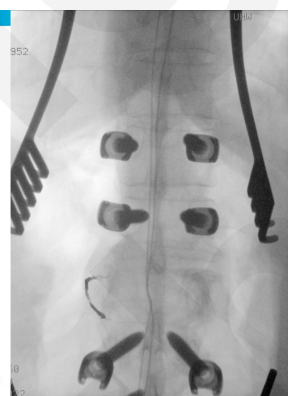
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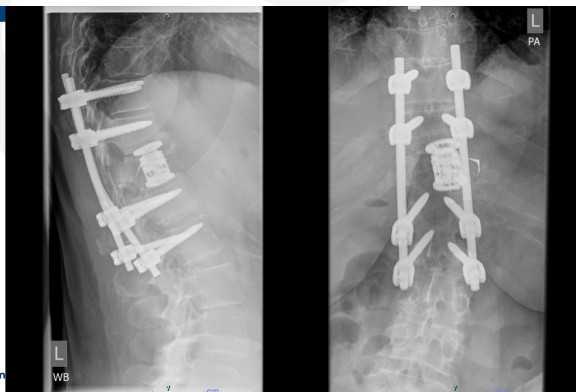


Case 8

- 60-year-old female
- Known breast cancer – stable
- Increasing thoracolumbar pain
- Known mets

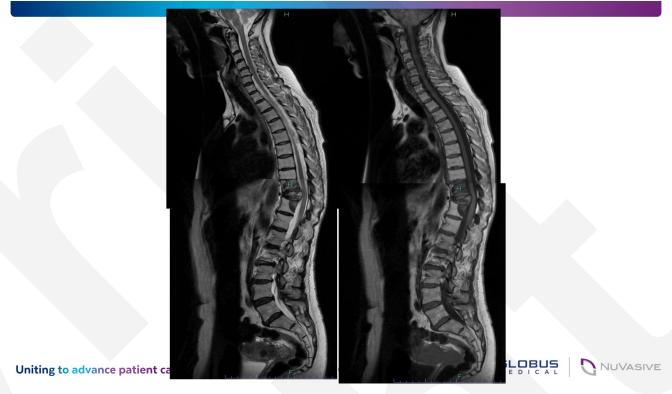
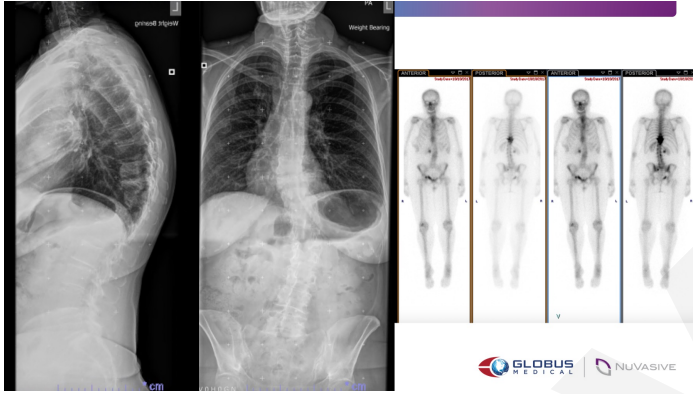
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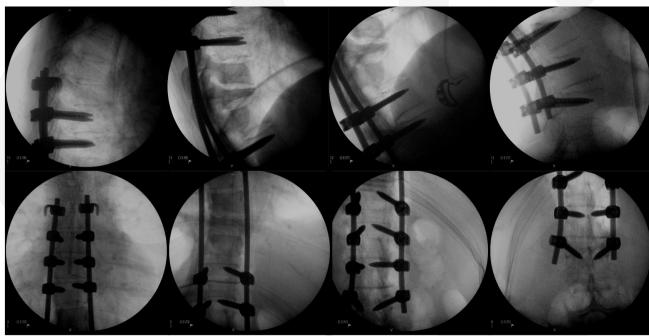
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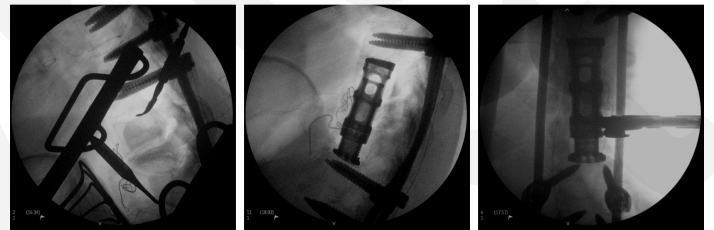
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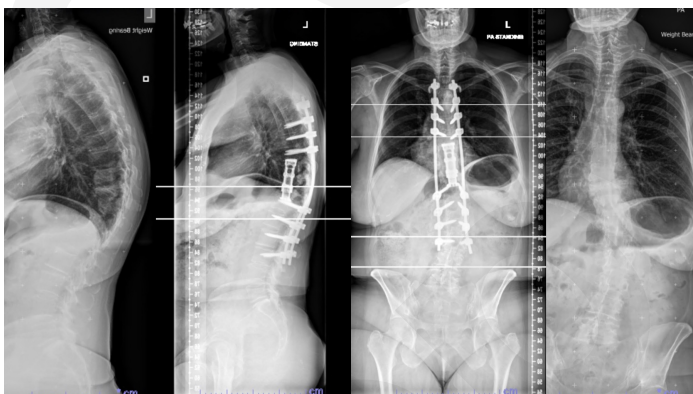
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Summary TLIF LLIF Tips for Reps

- Know the kit and its nuances
- Help the team get the right theatre set up
- Help the radiographer get the right angles
- Plan the implant sizes preop if able
- Double check the way the scrub has mounted the implants
- Be prepared for bailout procedures

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**Pay attention to the detail
Never let your guard down**

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