

Adult Deformity Correction

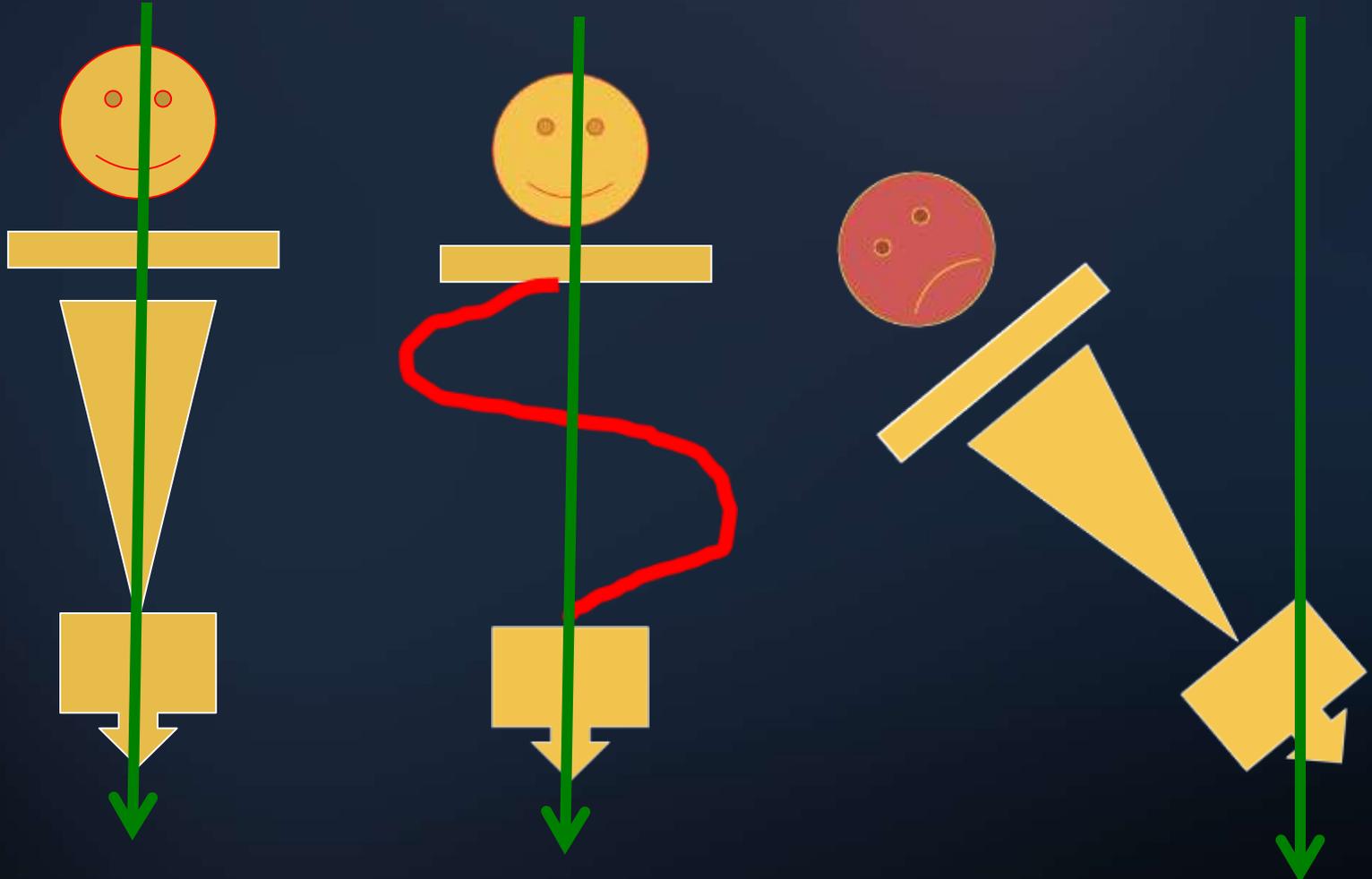
Osteotomies and Complications

Wayne Cheng, MD

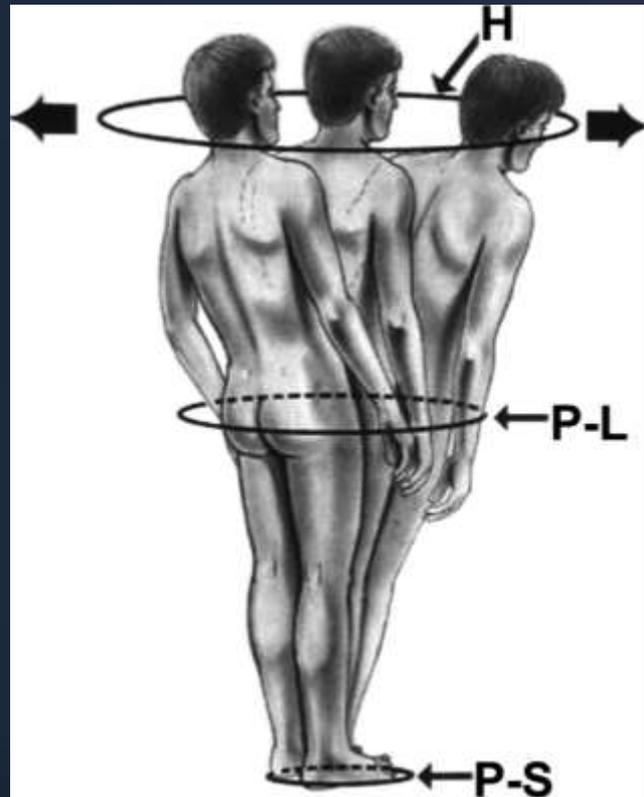
Professor

Bones & Spine Surgery

CONCEPT BALANCED SPINE



Cone of Balance/ Zone of Economy



Dubousset J. Three-dimensional analysis of the scoliotic deformity. In: Weinstein SL, ed. Pediatric Spine: Principles and Practice. New York, NY: Raven Press; 1994.

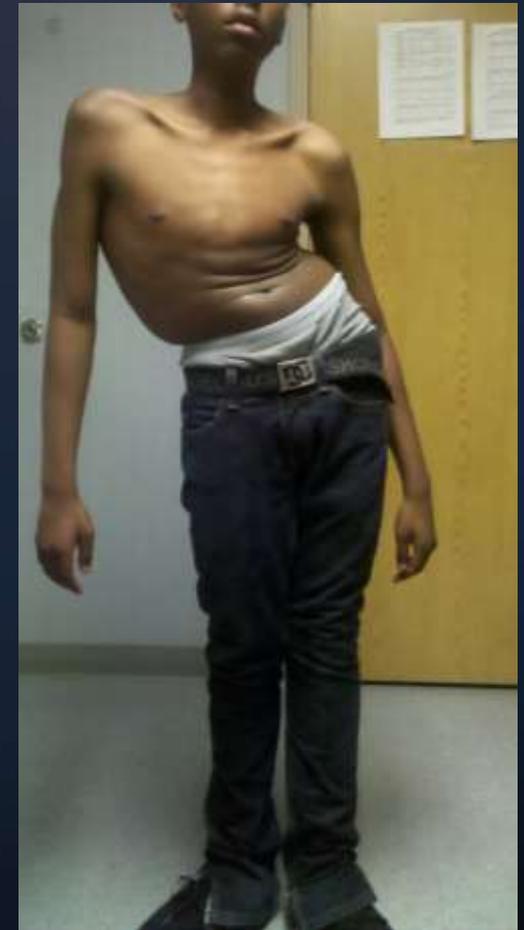
Presentation-flat back



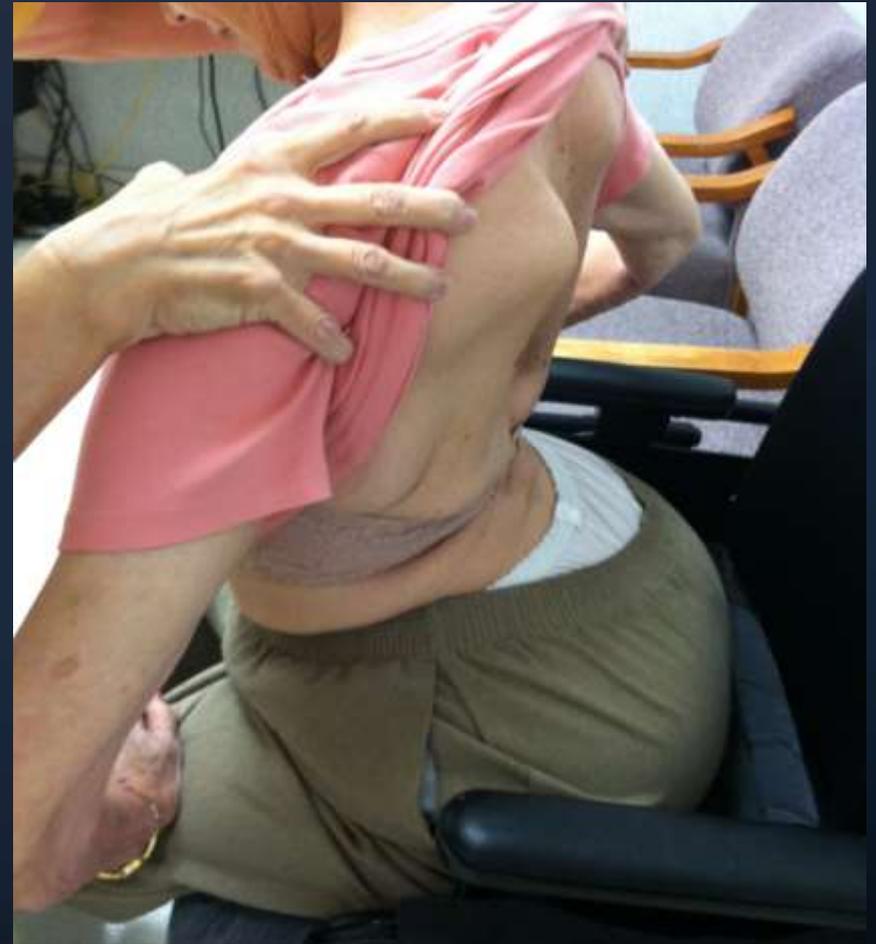
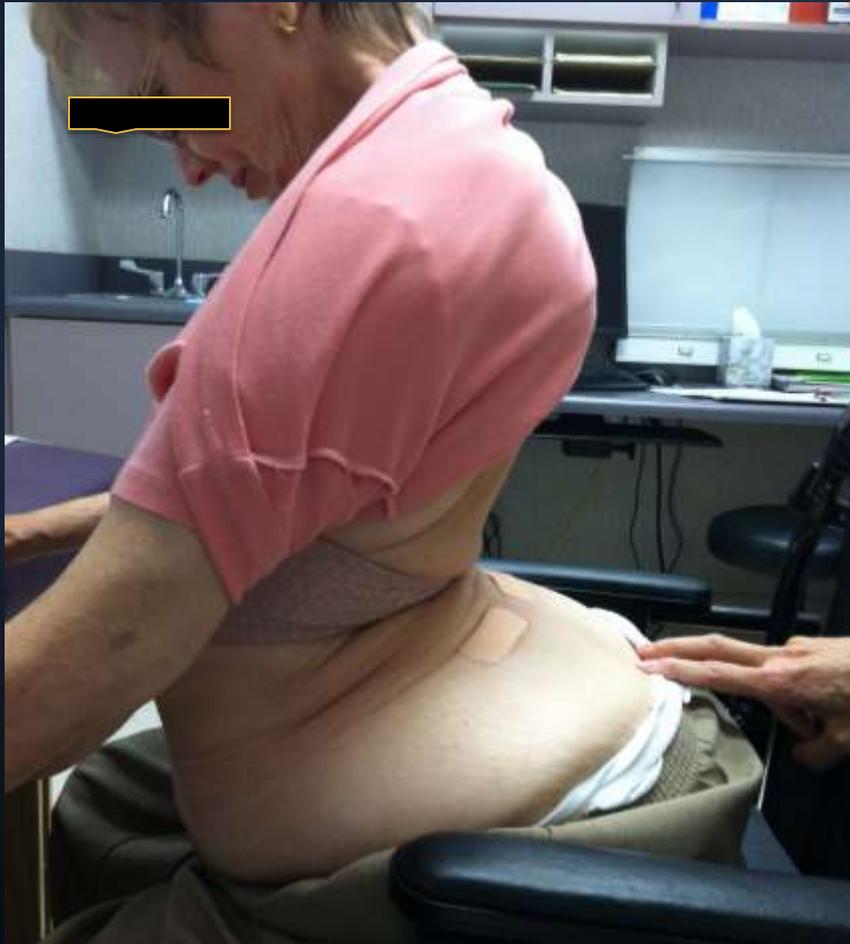
kyphoscoliosis



Presentation-Scoliosis



Presentation-hyperlordosis



Presentation-leaning



Radiographs

- 36 " standing xray
- CT myelogram
- CT + MRI
- DEXA



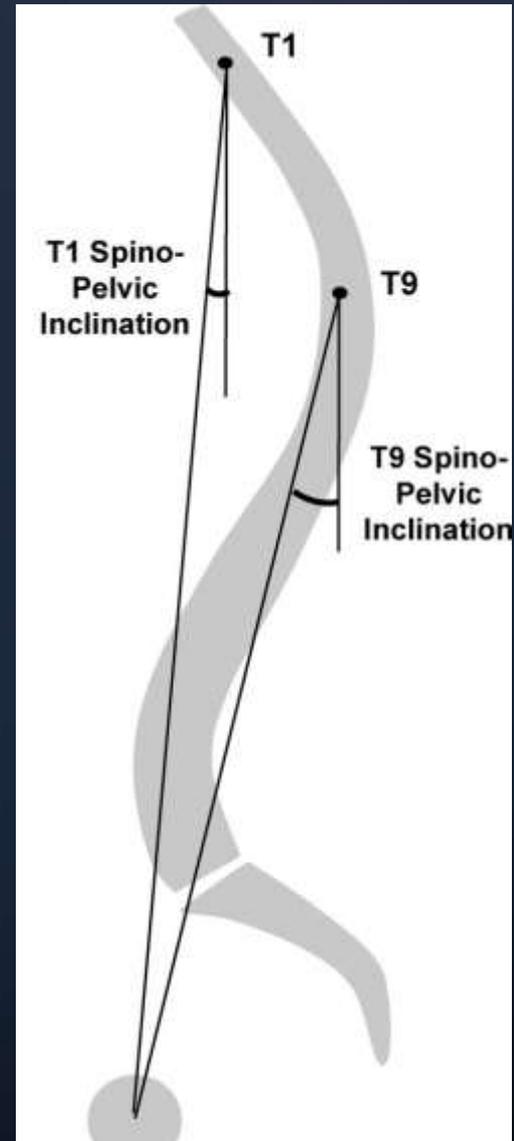
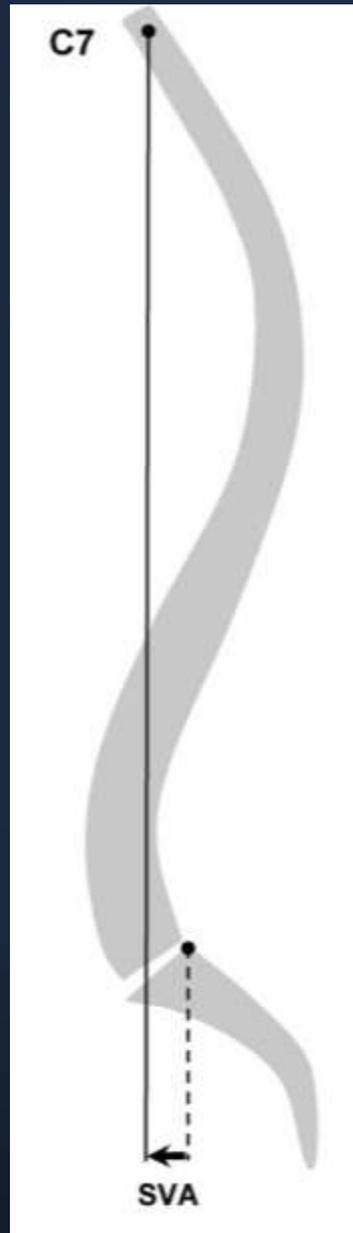
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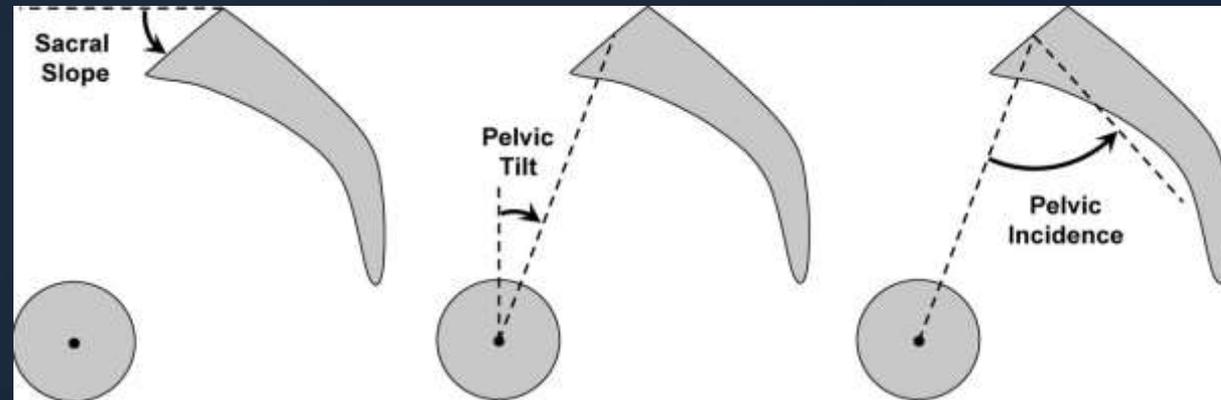
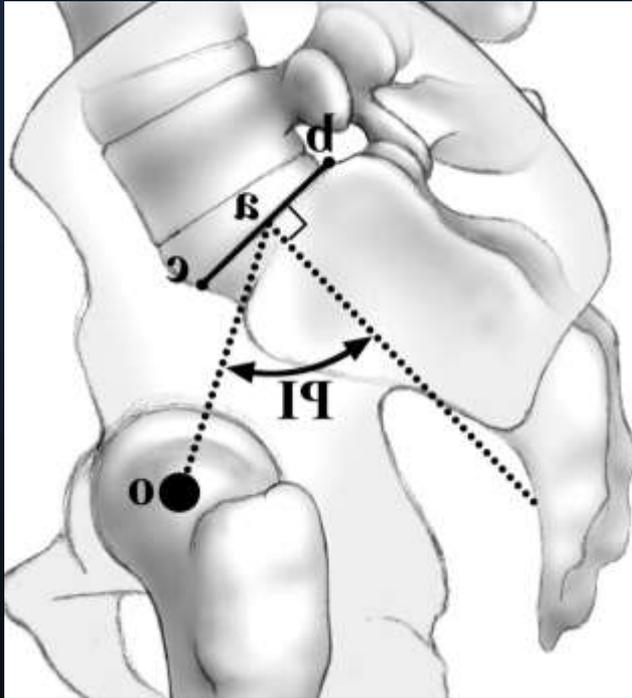
Radiographs - flexibility



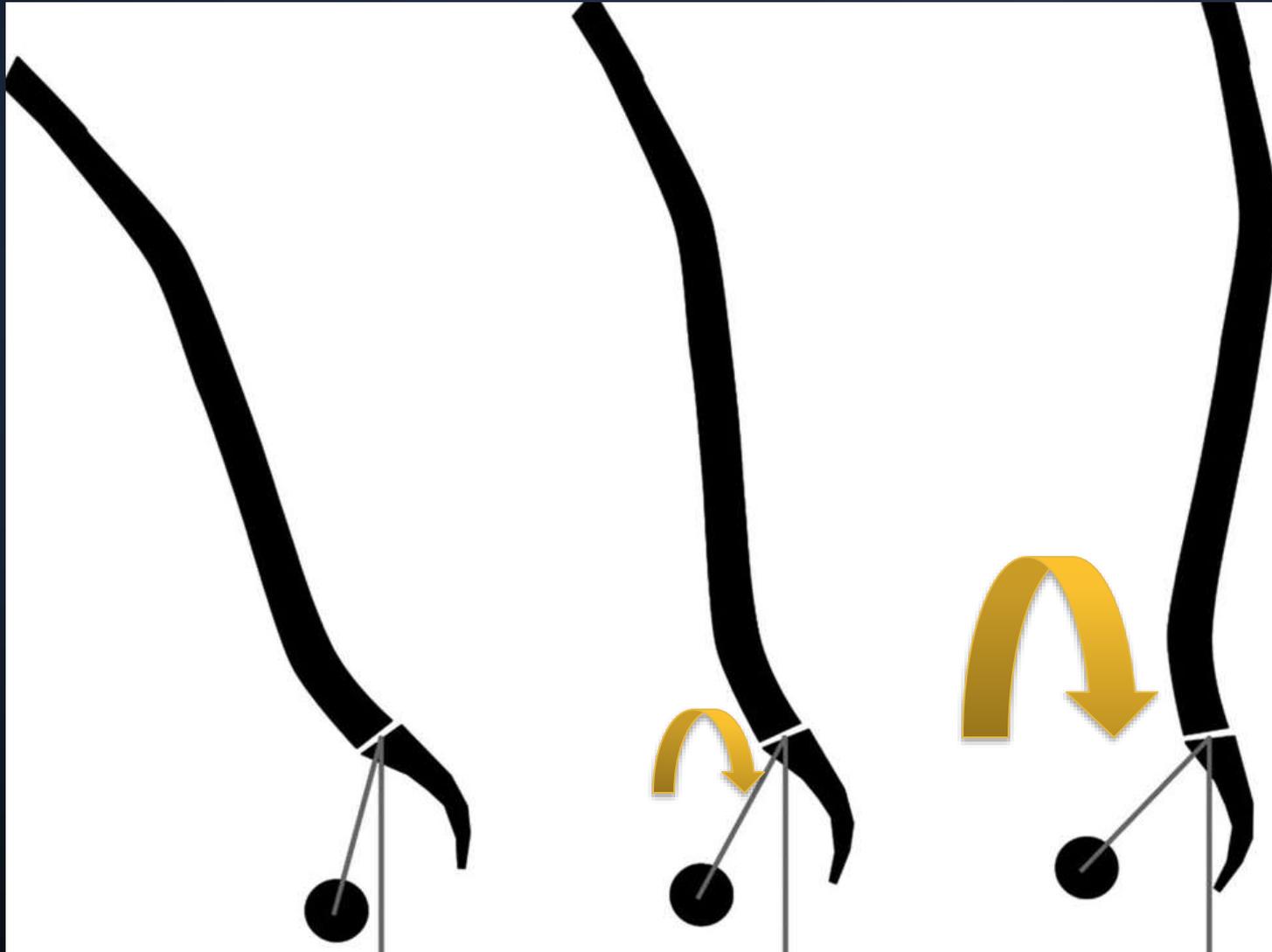
Sagittal Balance



Pelvic Perimeters

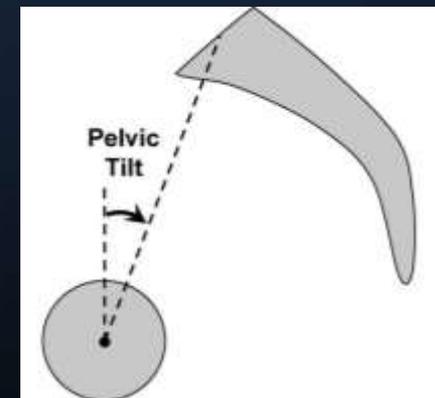
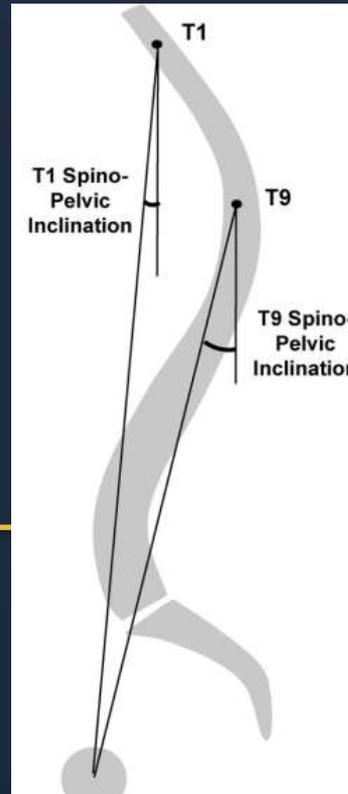


Pelvic Retroversion



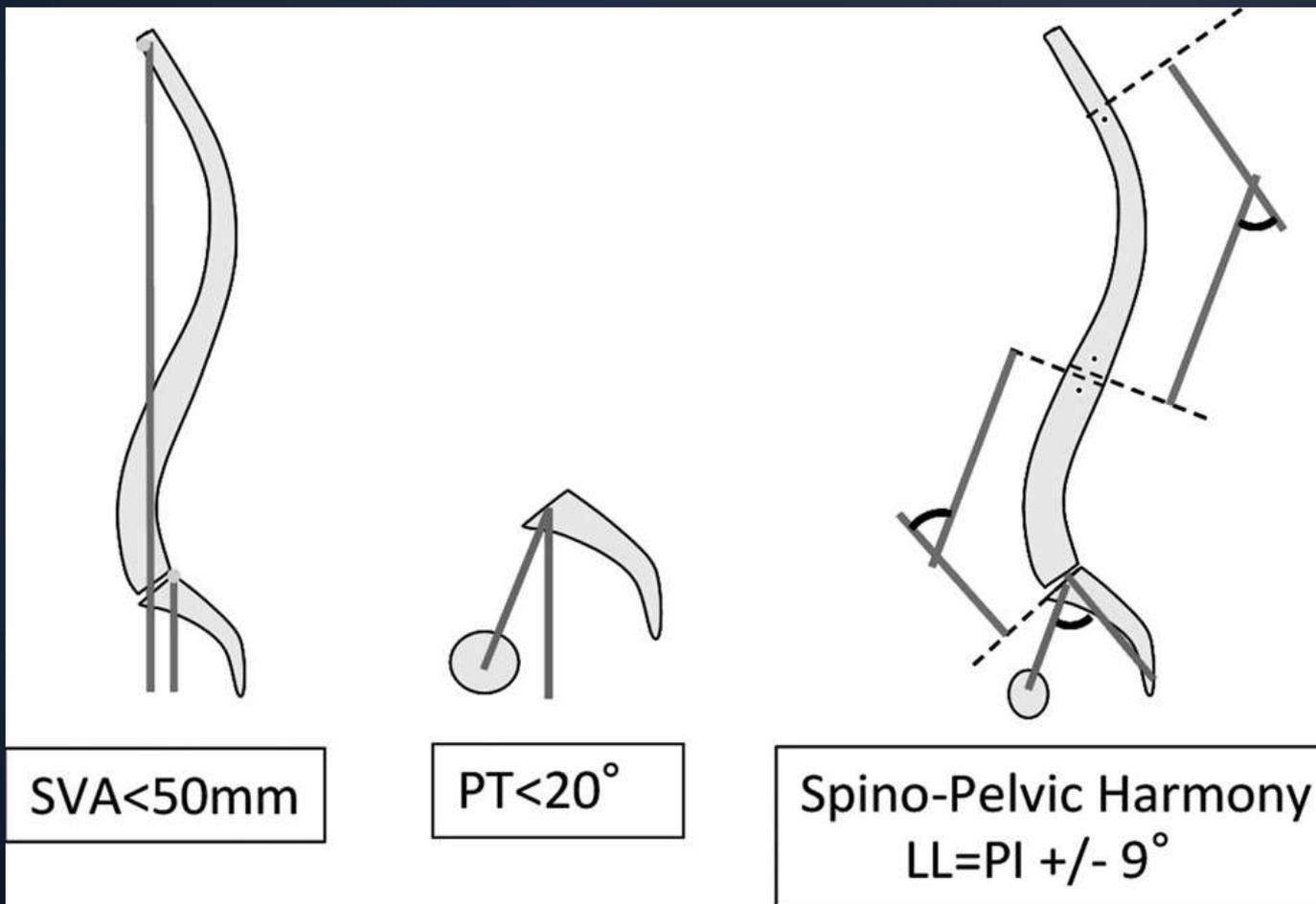
Which One is most important?

Based on HRQL
(health related quality
of Life) tools.



1. *T₁-SP incidence*
2. *SVA*
3. *Pelvic Tilt*

Goals



Goal

If Hyperkyphotic (TK >40)

- $LL < 45 - TK - PI$

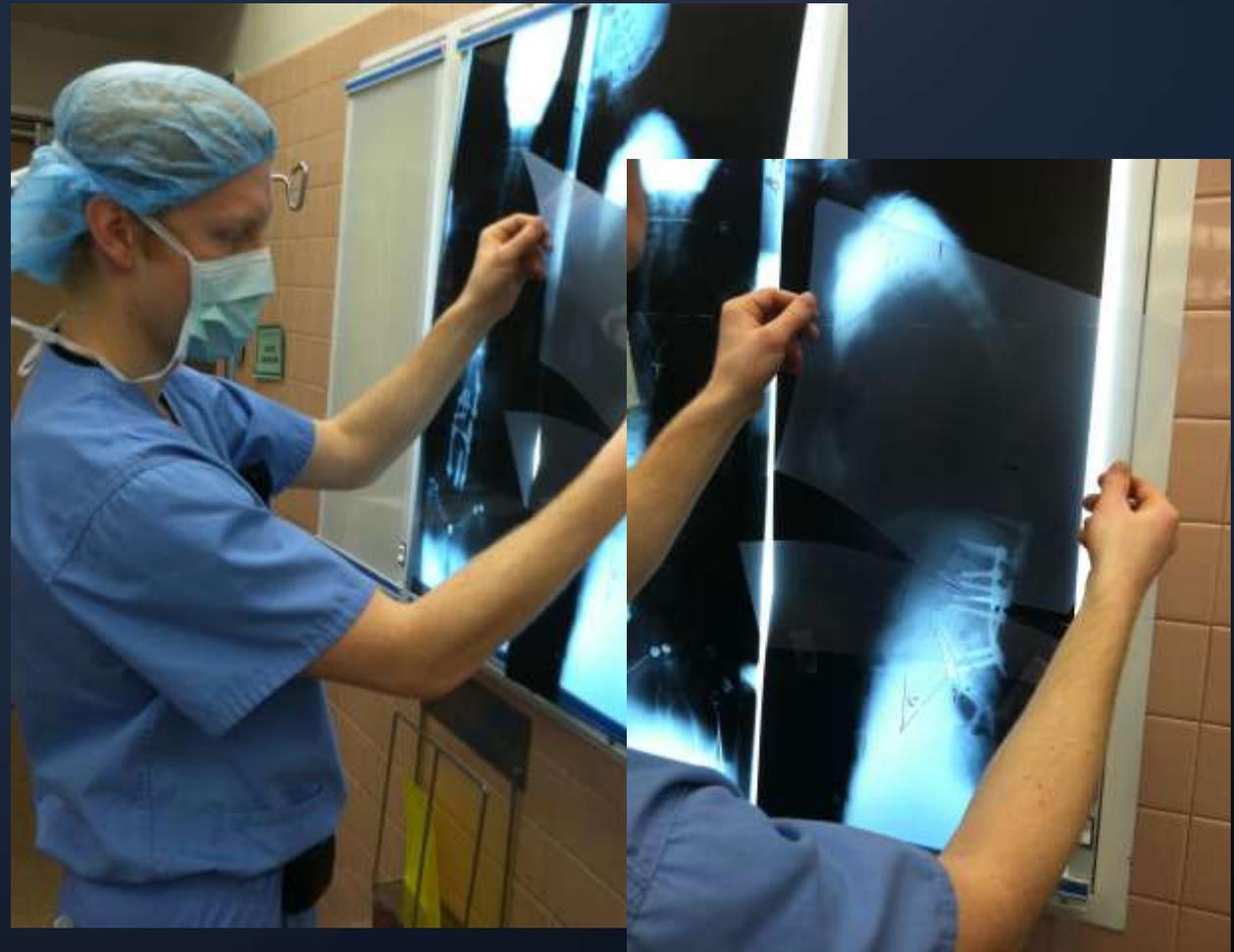
Bridwell et al. Spine 34:8 2009 (

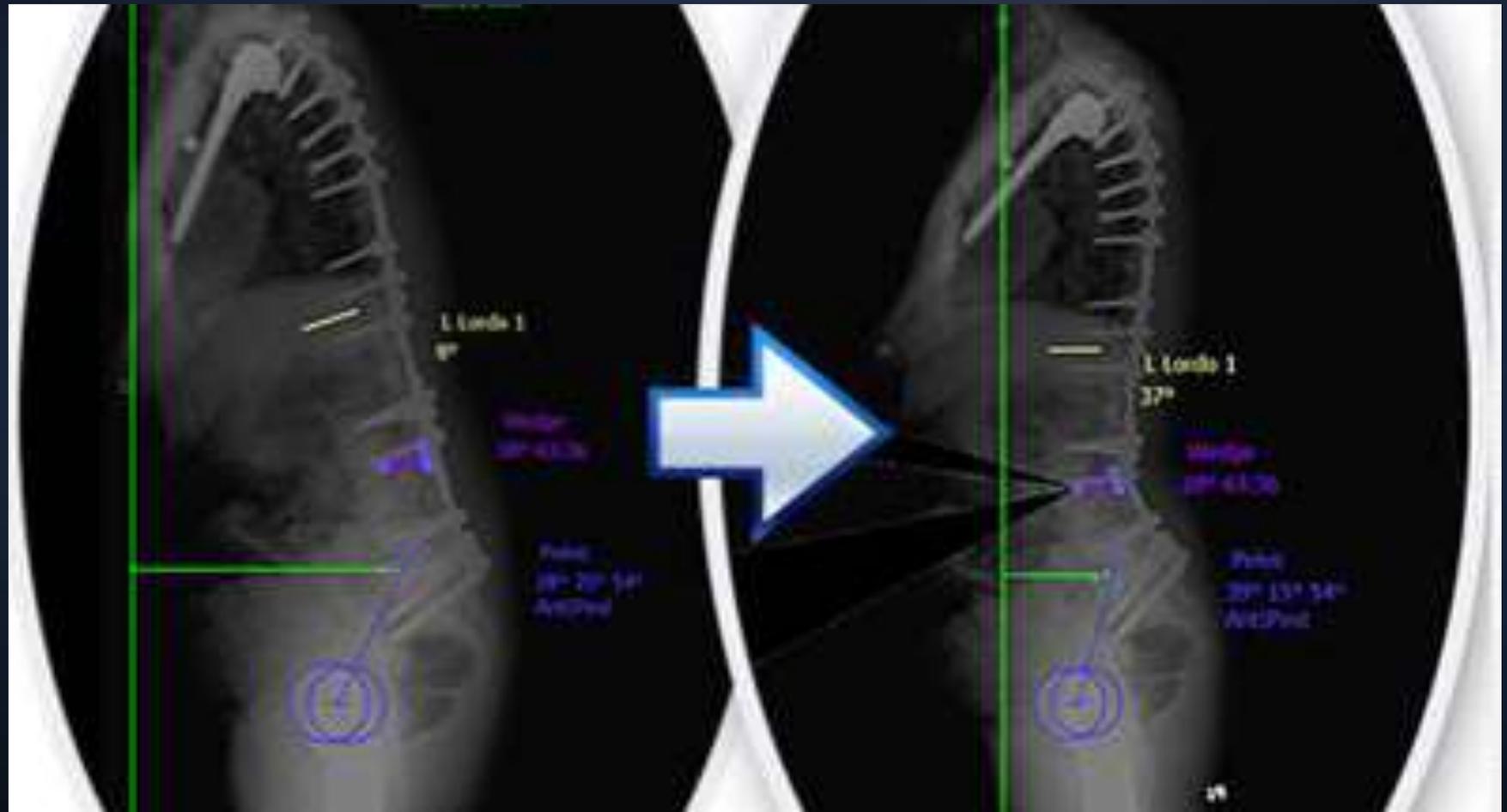
Type of Osteotomy

- **Posterior Column (Smith-Petersen/ponte)**
 - (mobile disc) – 5 to 15 deg.
 - (Ankylosing sp) – 20 to 35 deg
- **PSO** – 25 to 40 degree
 - Biplain
 - Triplain
- **VCR** – 40 to 60 degree
- **Anterior/posterior** 10 to 25 degree
- **Combination** +/- multi-level

Calculation

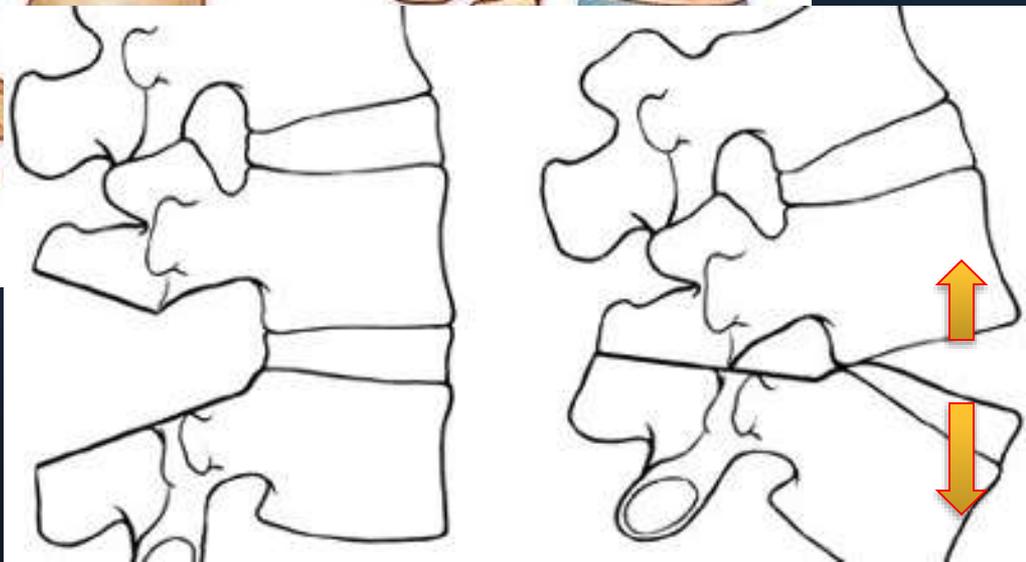
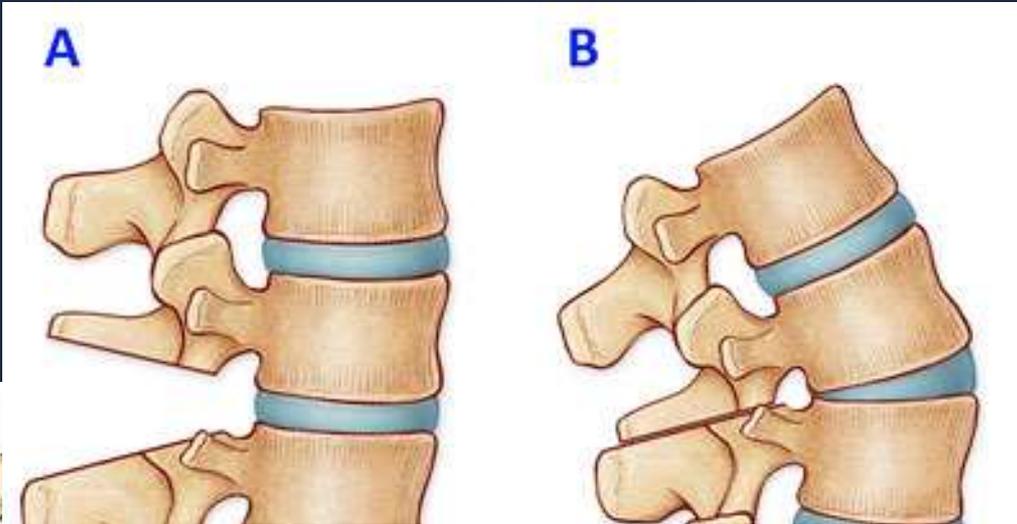
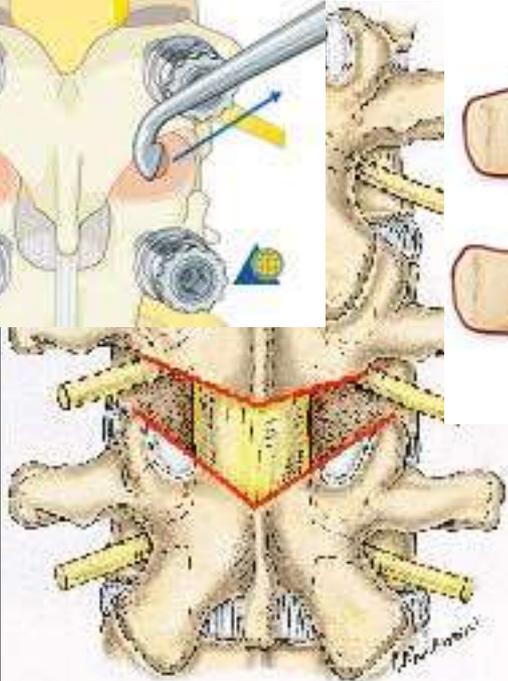
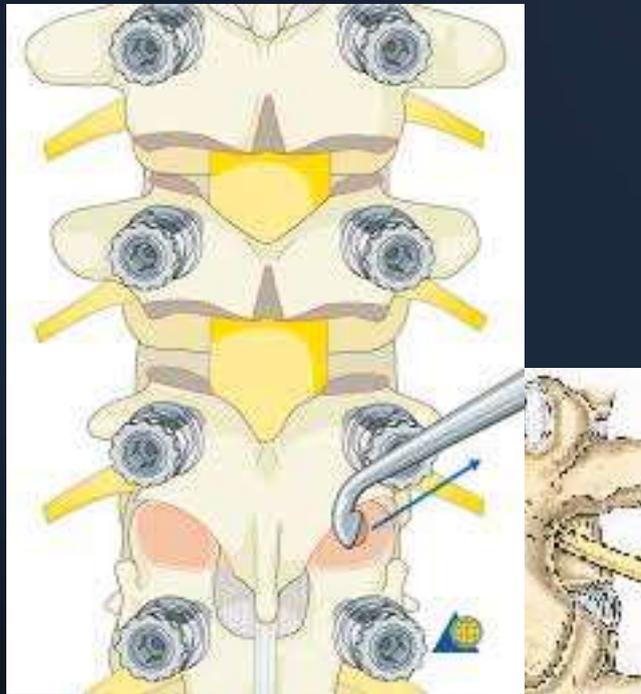
- Measure
- Surgimap – spine
- Tracing paper





Posterior Column Osteotomy

Smith-Petersen Vs. Ponte



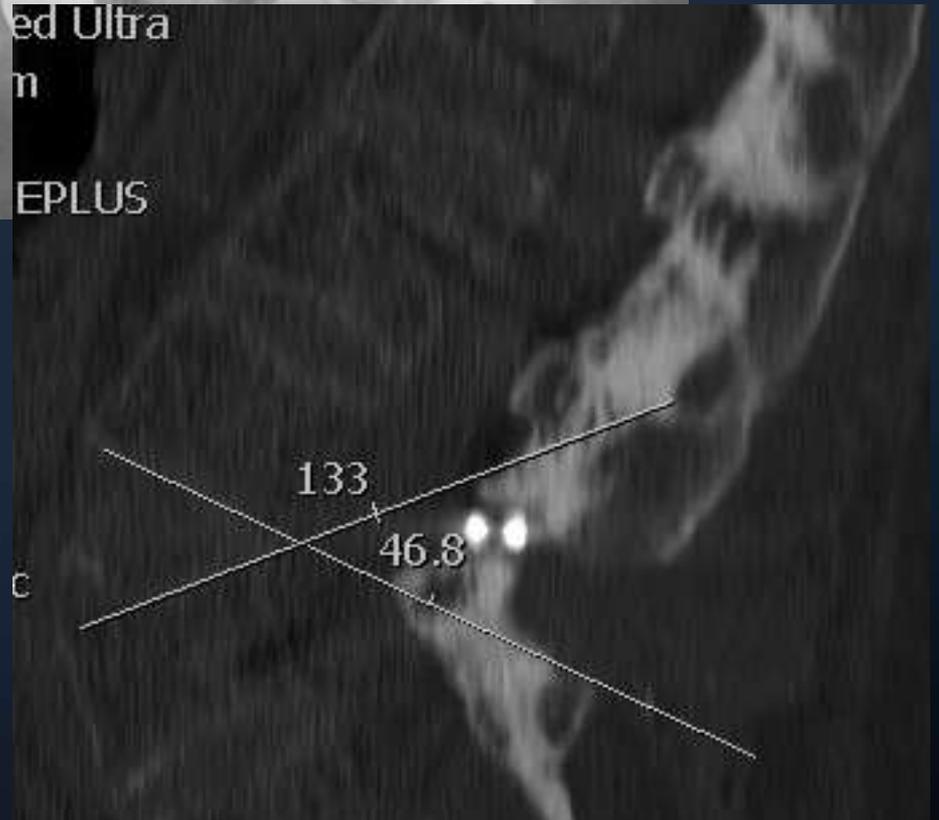
Smith Petersen Osteotomy

44 yo m, jewelry polisher with
AS

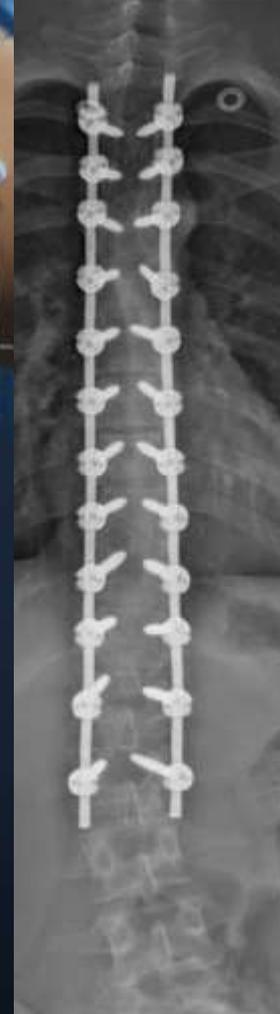
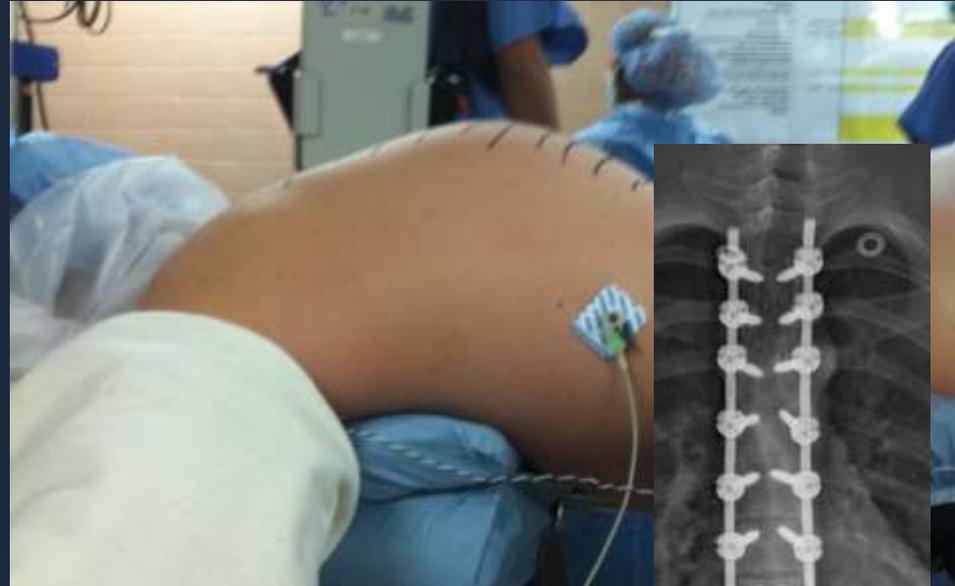


ed Ultra
m

EPLUS



Ponte Osteotomy



1 Level PSO

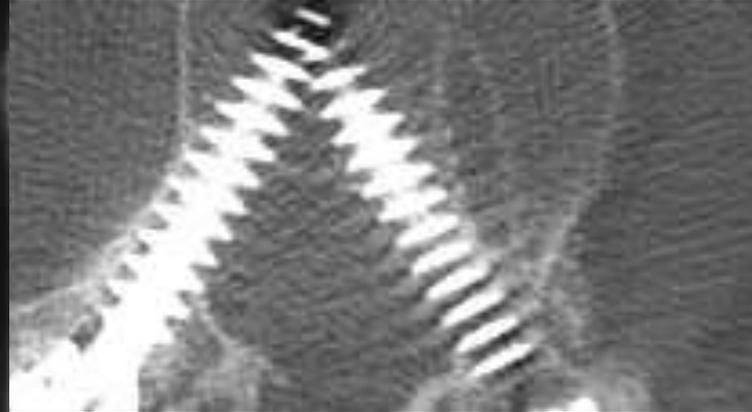
54 yo F, 10 prior back surgeries, h/o MRSA, failed osteotomy, pain nump. Severe back pain



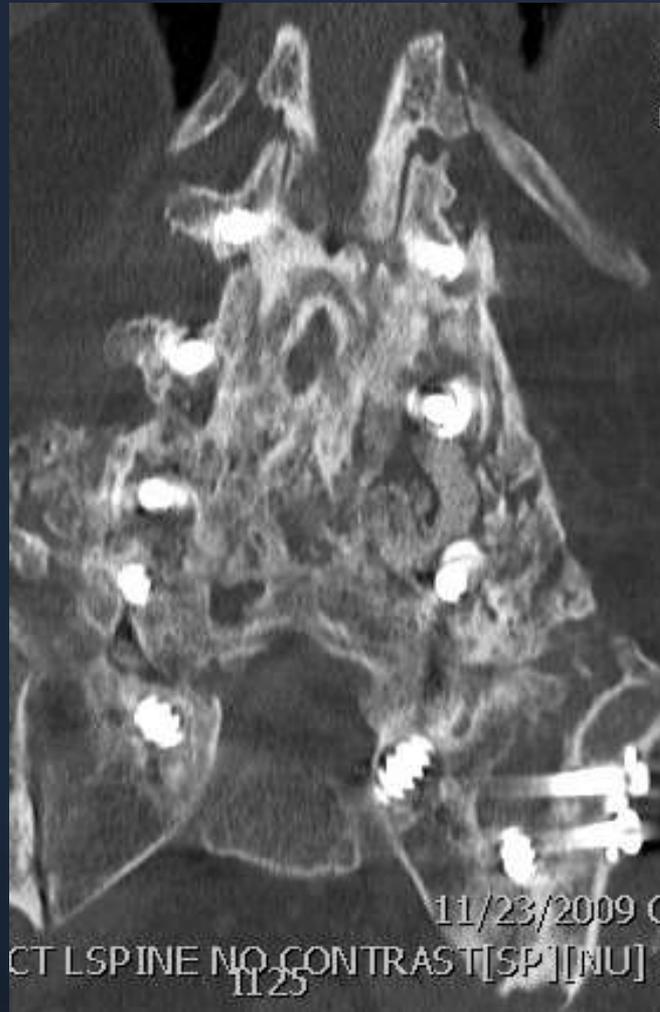
- TK 5 deg ($20-40$)
- LL 35 deg ($30-80$)
- SVA 10 cm (<5)
- PI 70 (42 ± 10)
- PT 45 (13 ± 7)



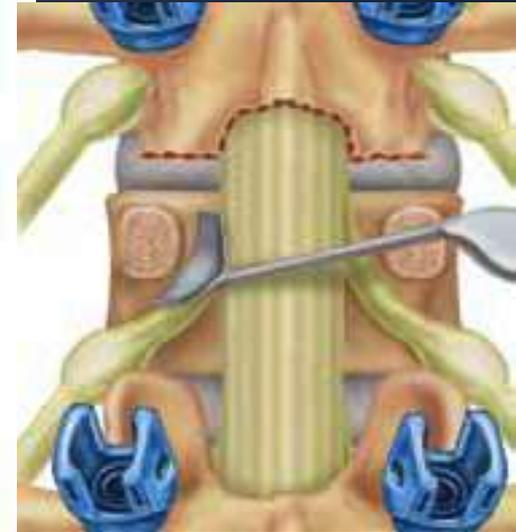
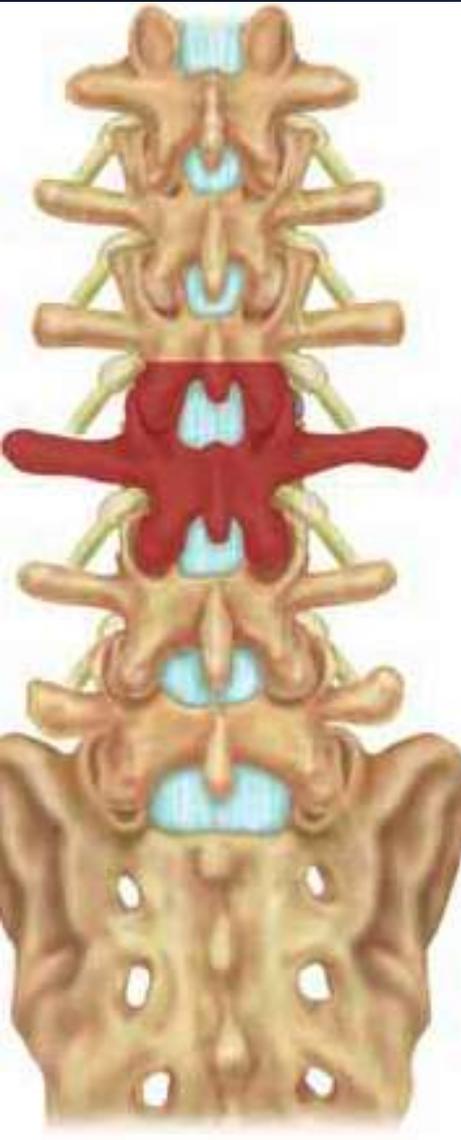
Failed PSO



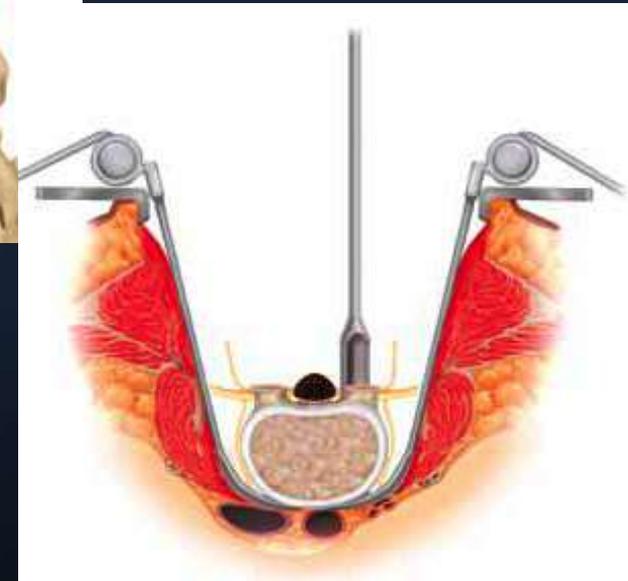
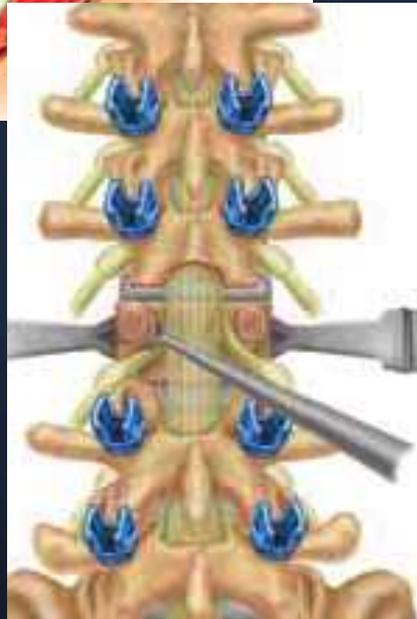
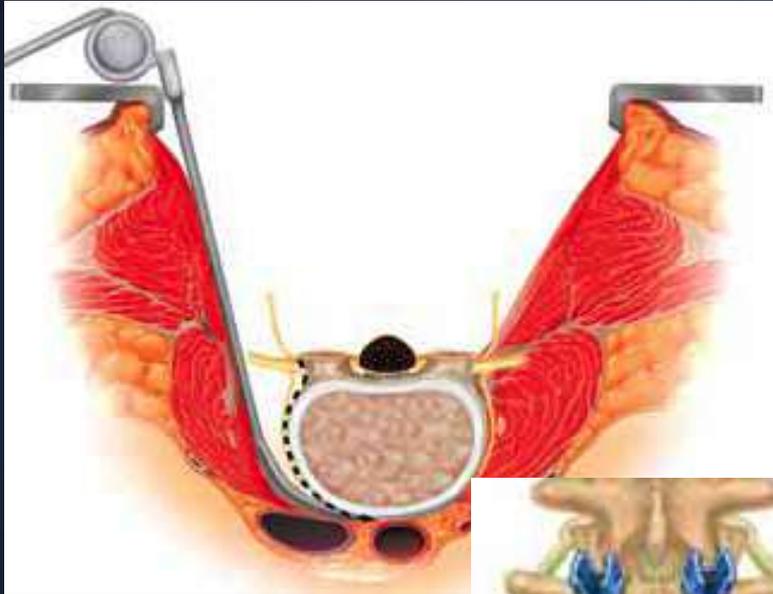
Fusion mass



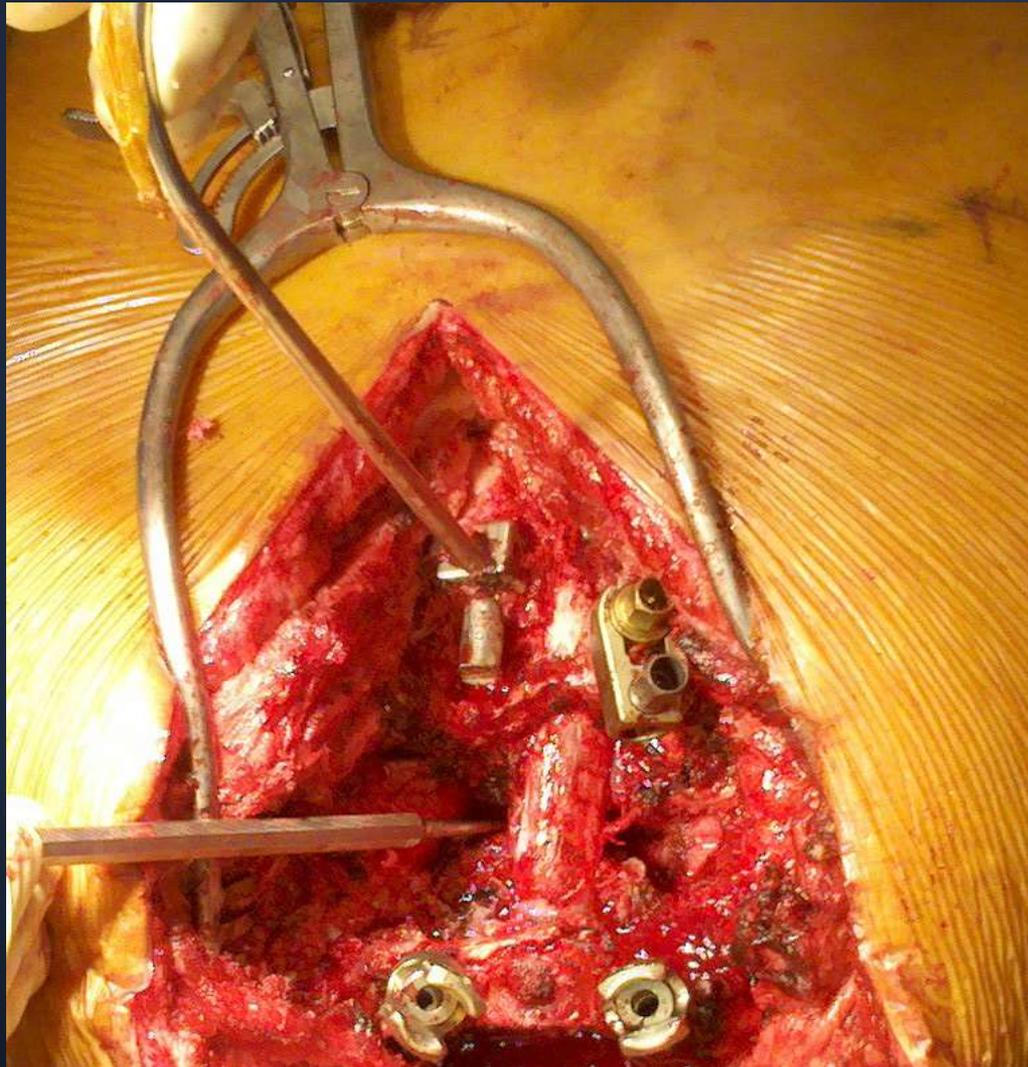
PSO - Bony resection



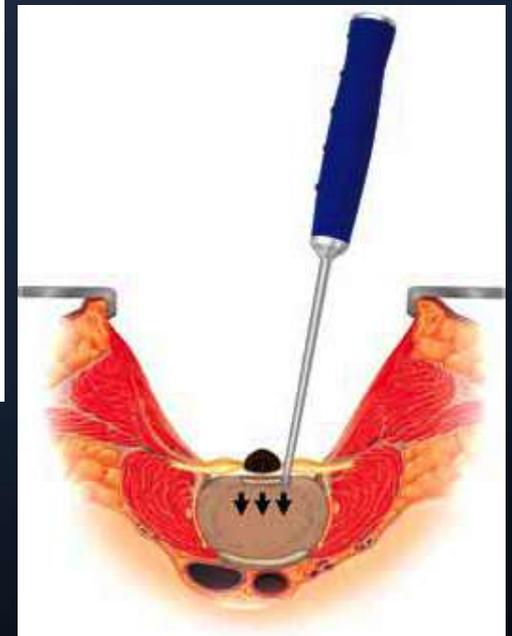
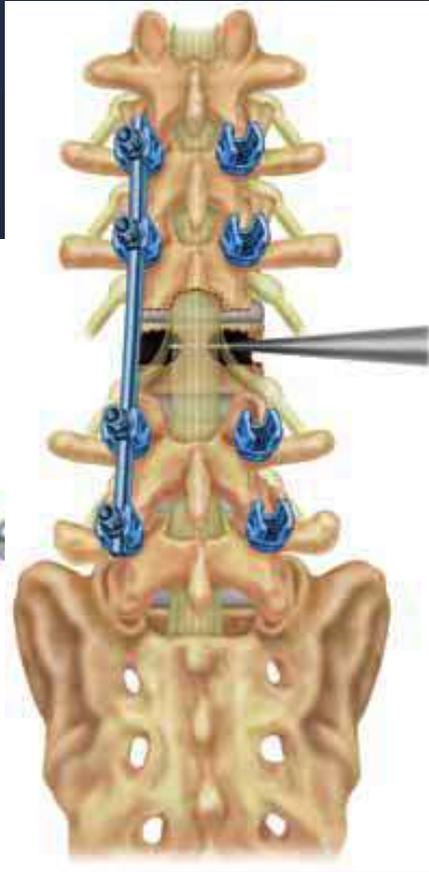
PSO



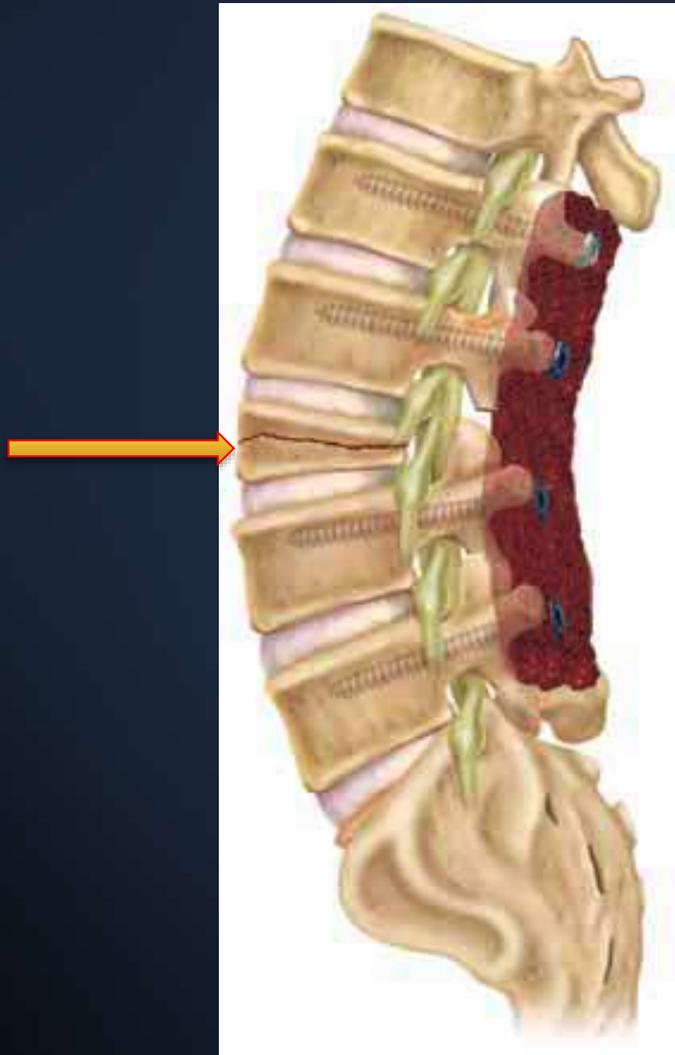
Osteotomy



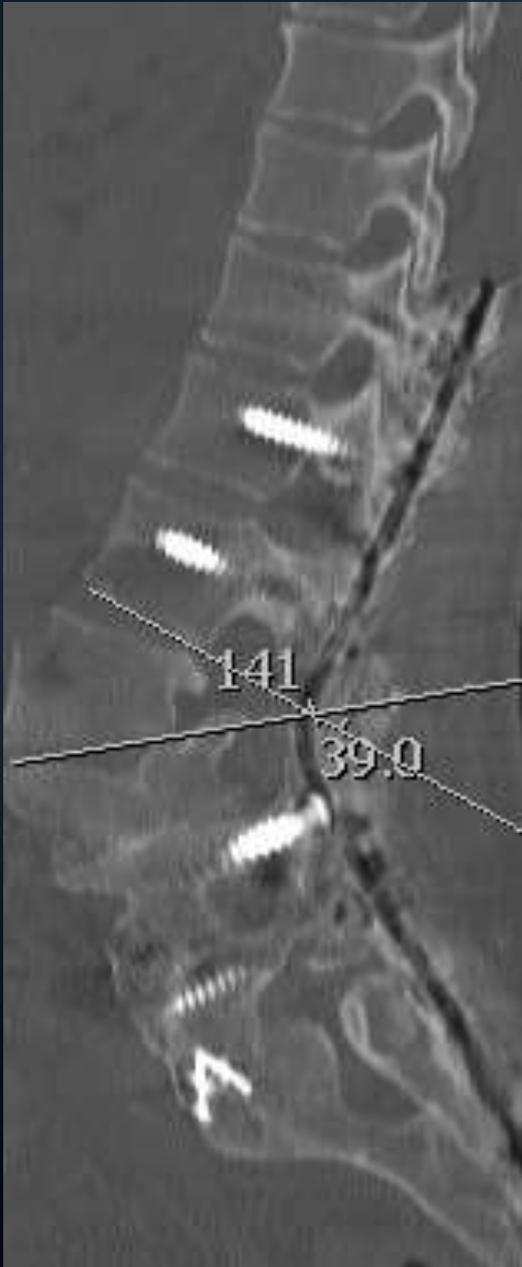
PSO



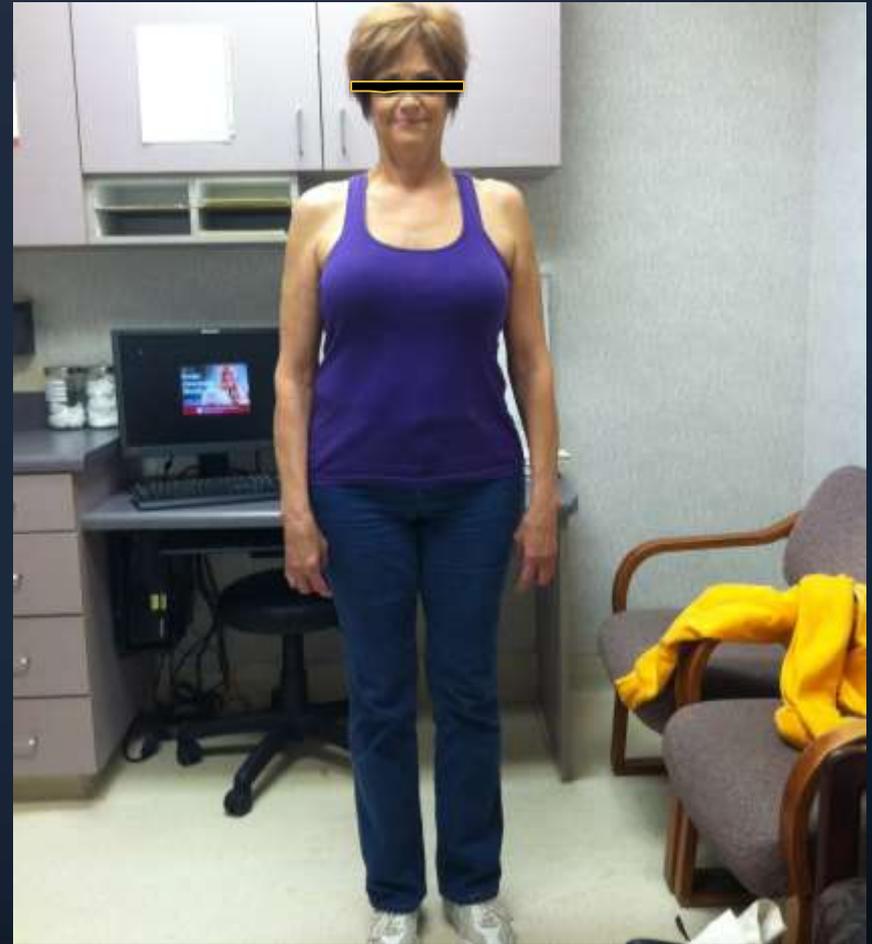
PSO



1 level pedicle subtraction osteotomy

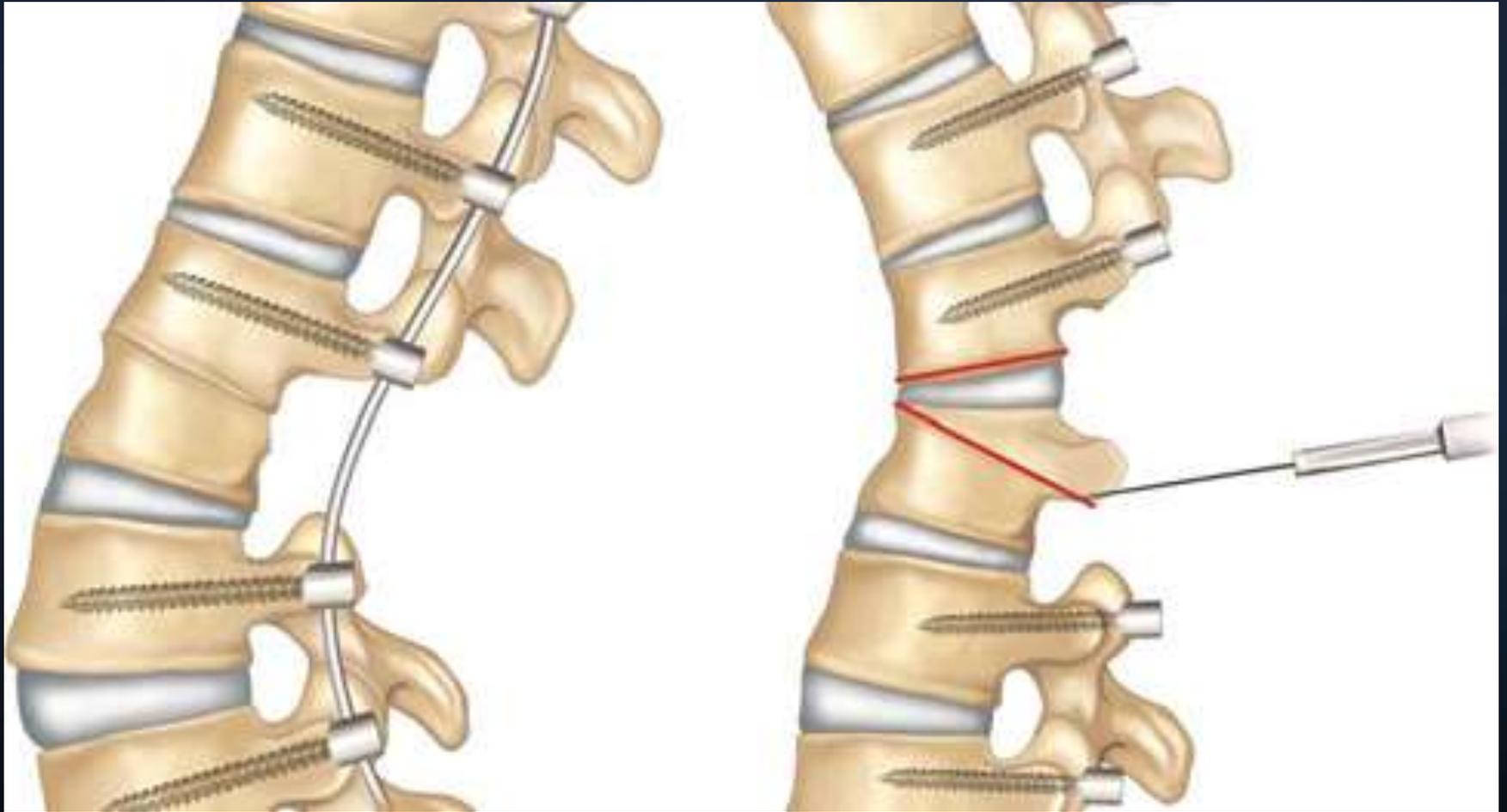


5 years Post op



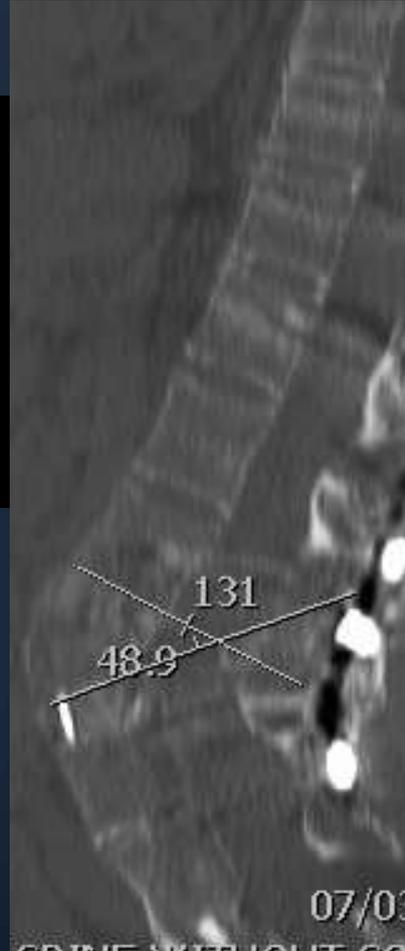
PSO variation

Bone Disc Bone Osteotomy



PSO

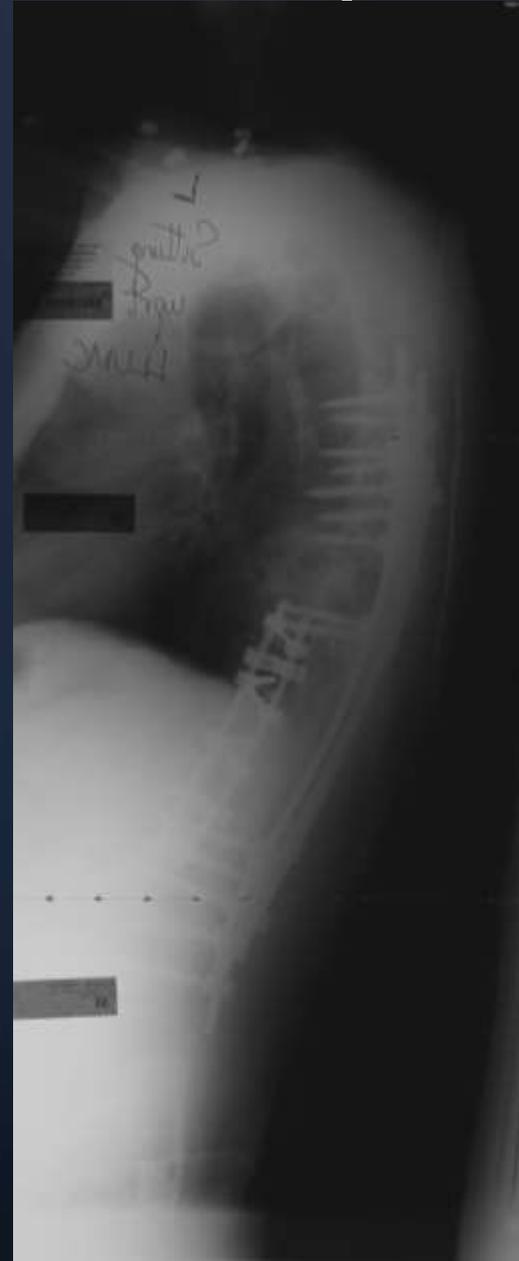
53YO F, 16 prior back surgery



Thoracic osteotomy



Thoracic osteotomy



2 Level PSO



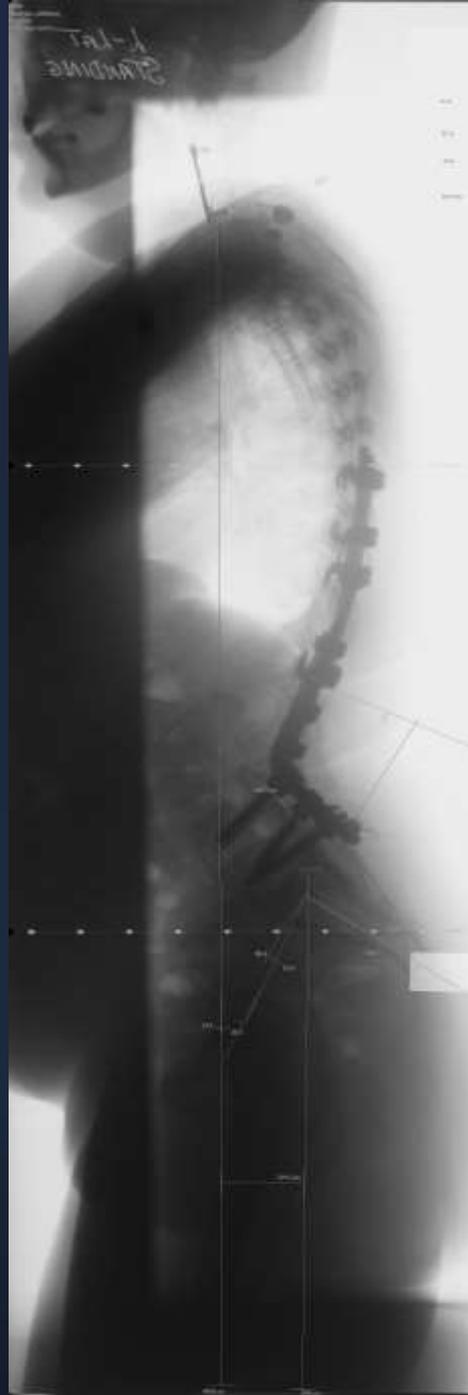
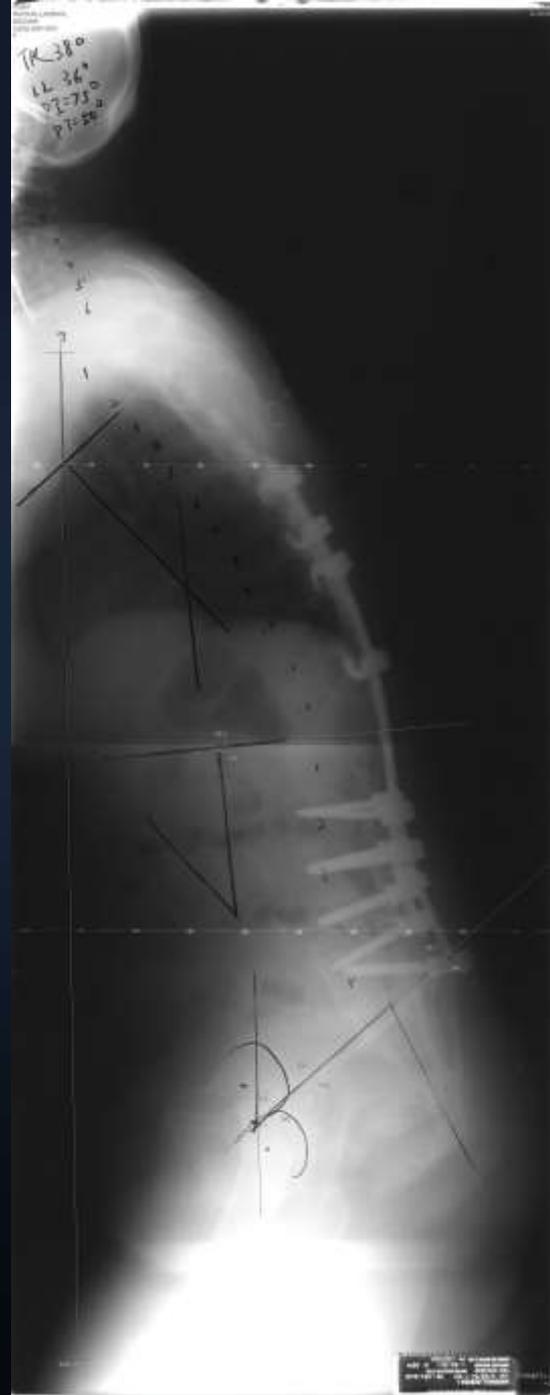
- PI 73
- Expected lordosis 83
- Need additional 50 lordosis

2 level pso



2 level pso

- PI: 75 83
- LL:36 81
- PT: 50 25
- SVA:15 5



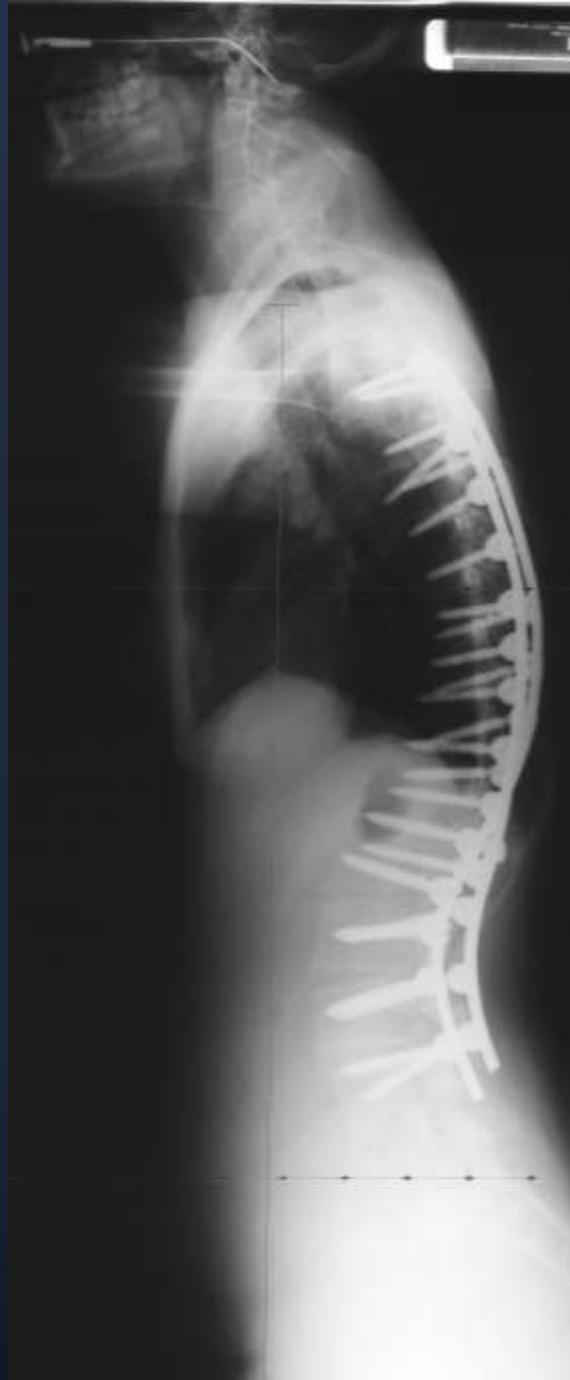
2 level PSO

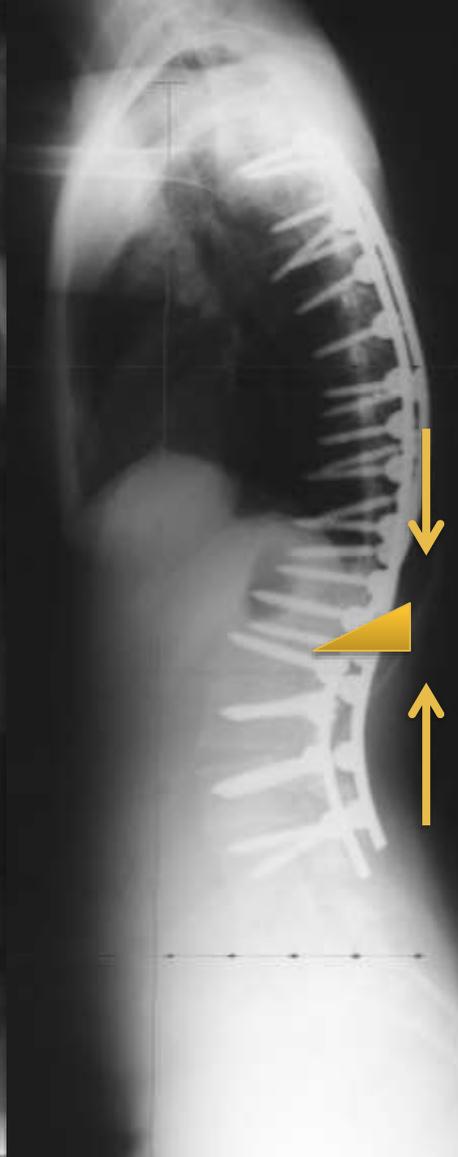


Multi-plain PSO

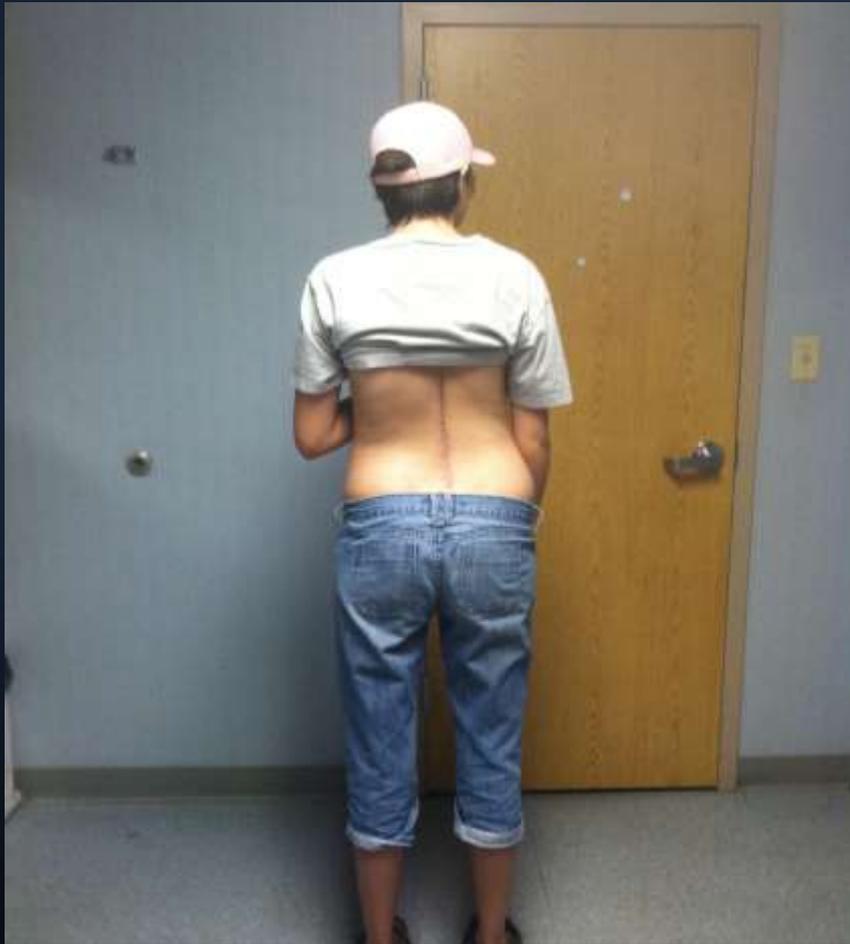




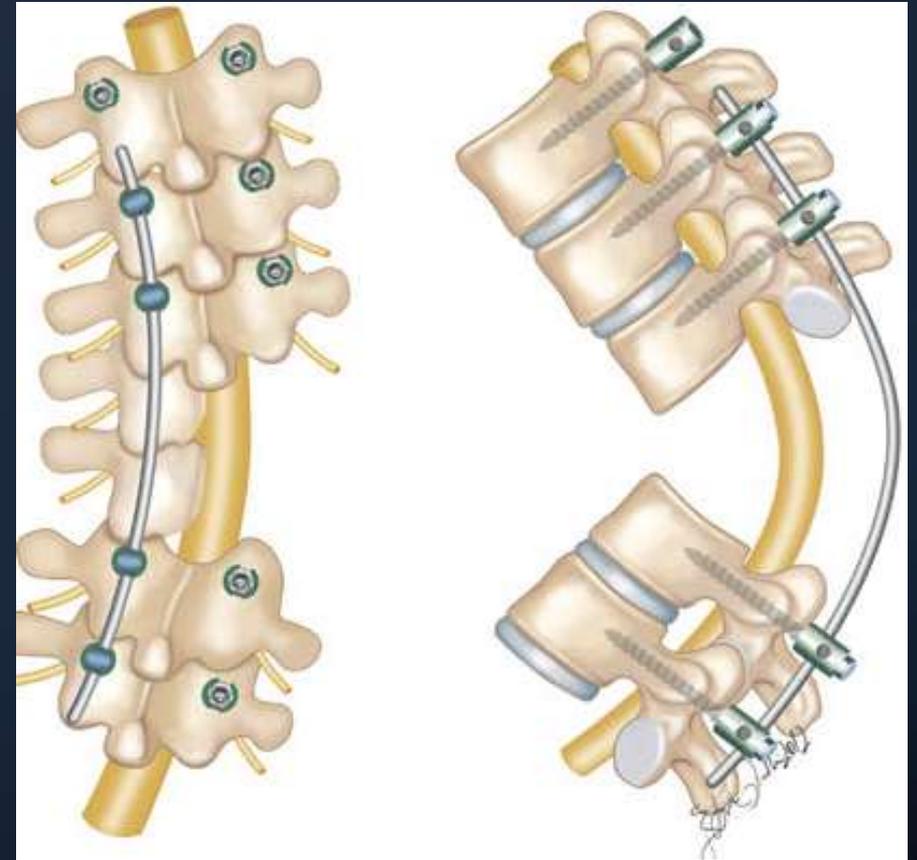
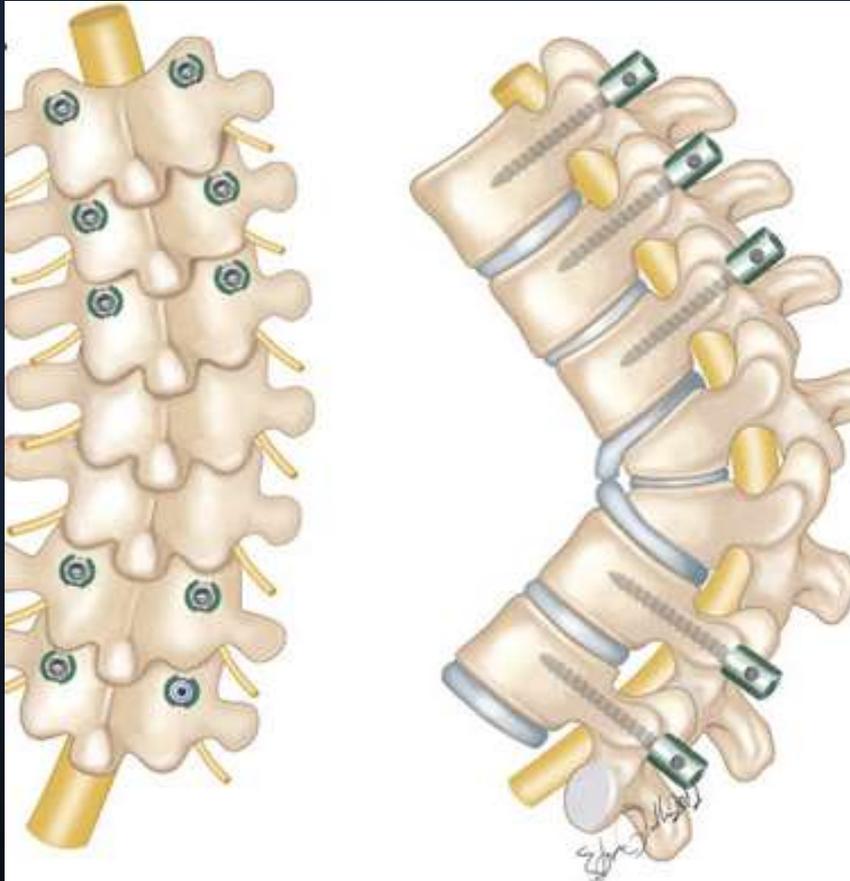




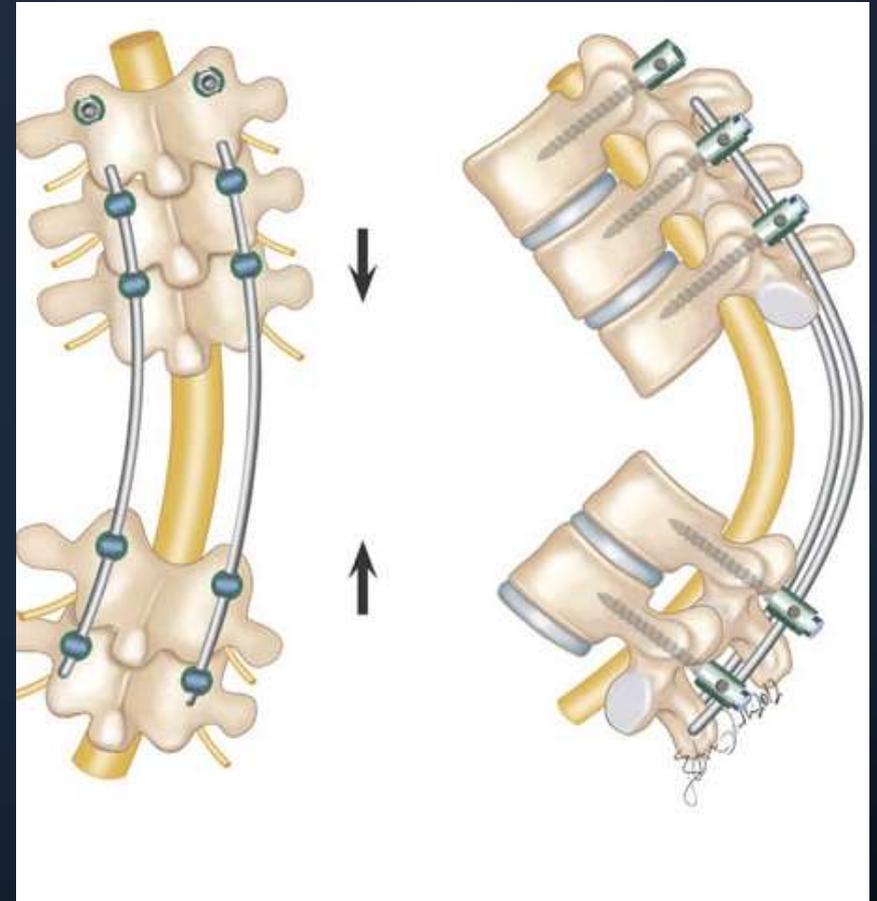
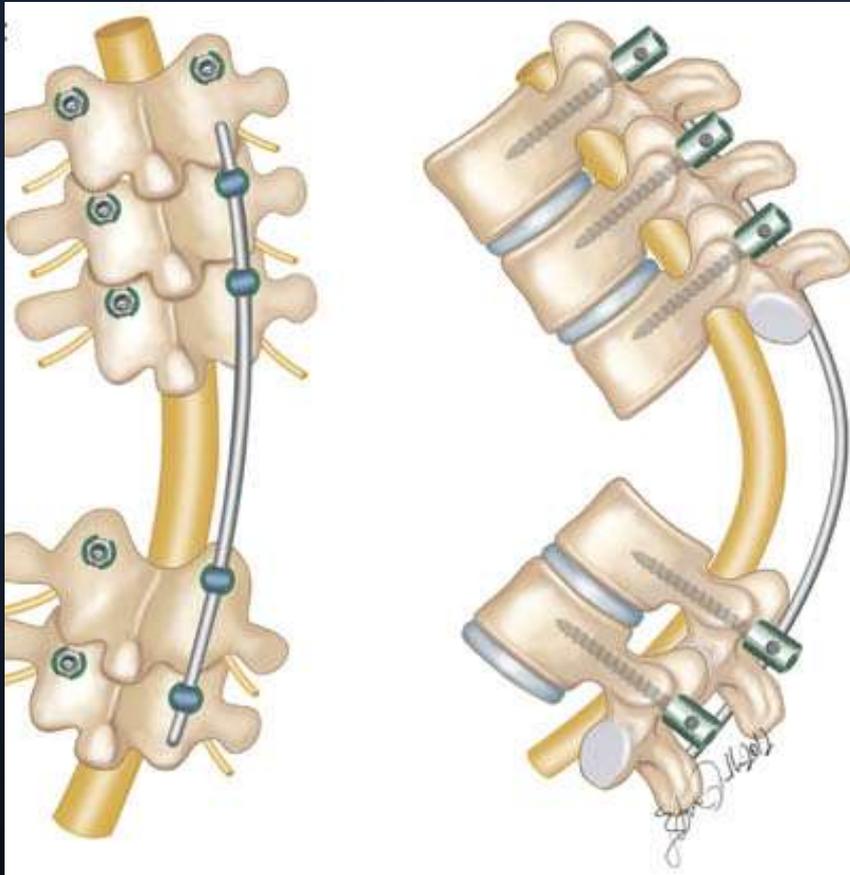
Multi-plain PSO



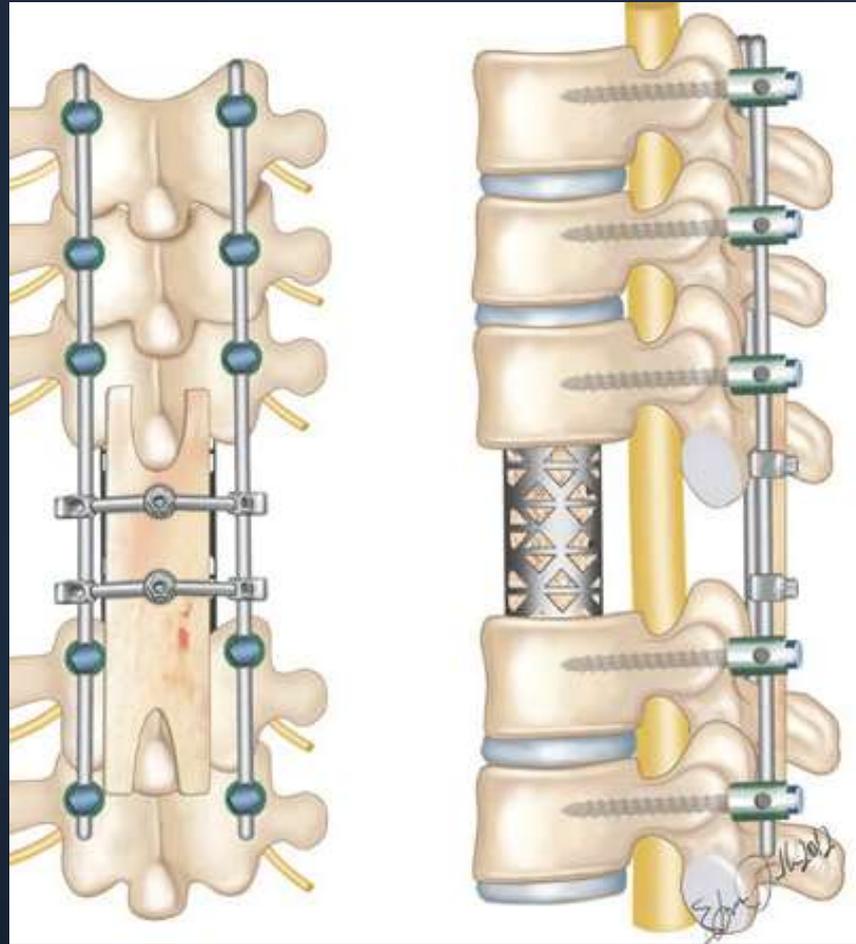
VCR

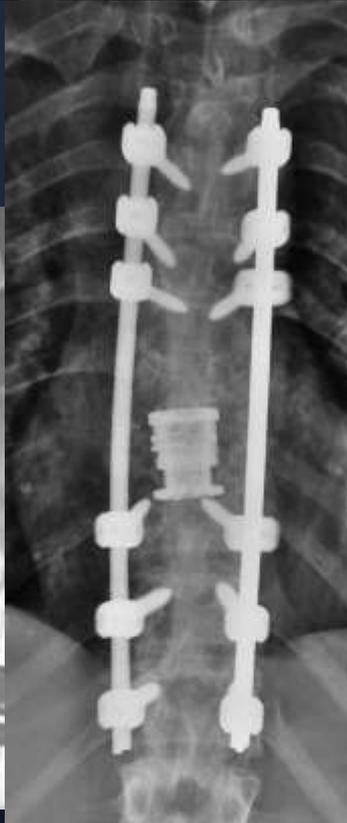
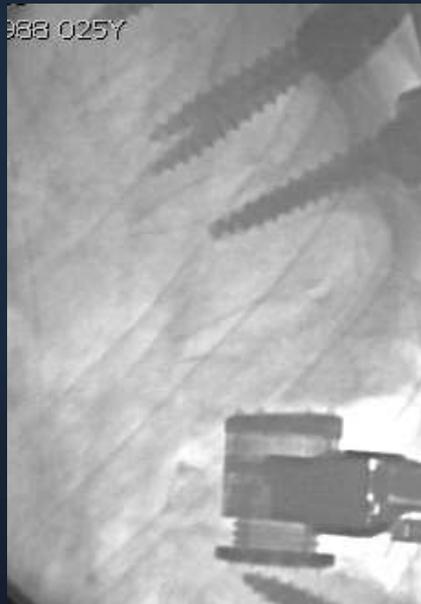
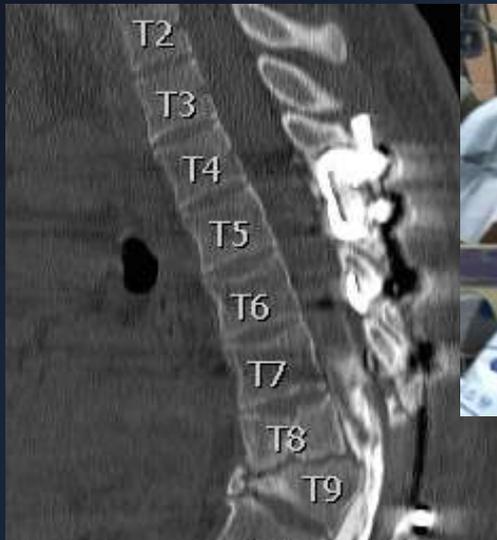


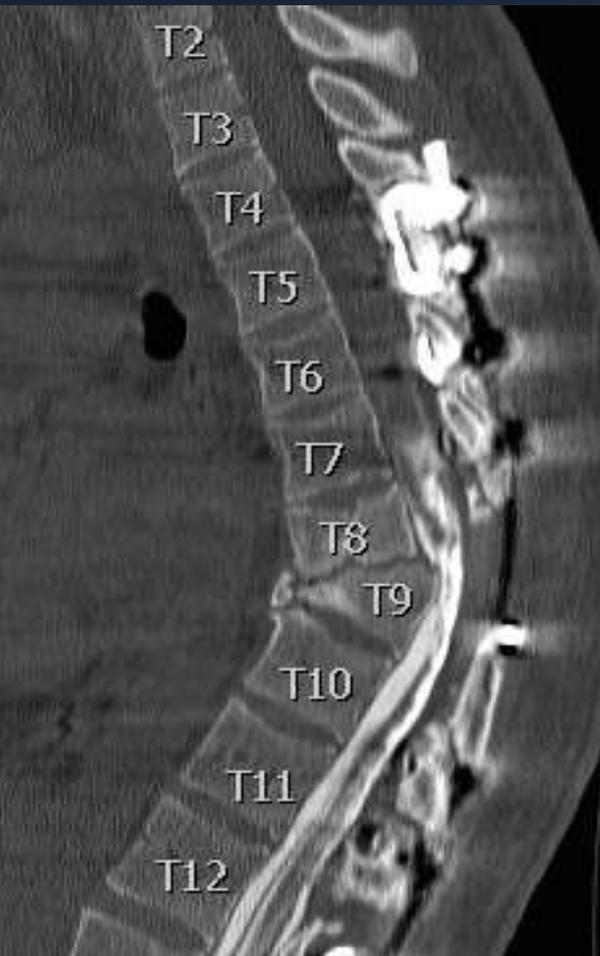
VCR



VCR





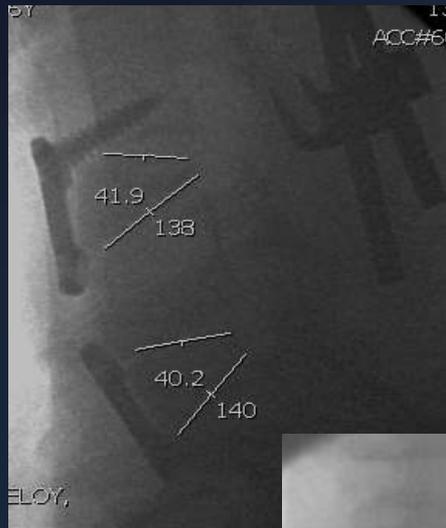


FRONT & BACK

25 year old F, previous scoliosis reconstruction.



Front & Back

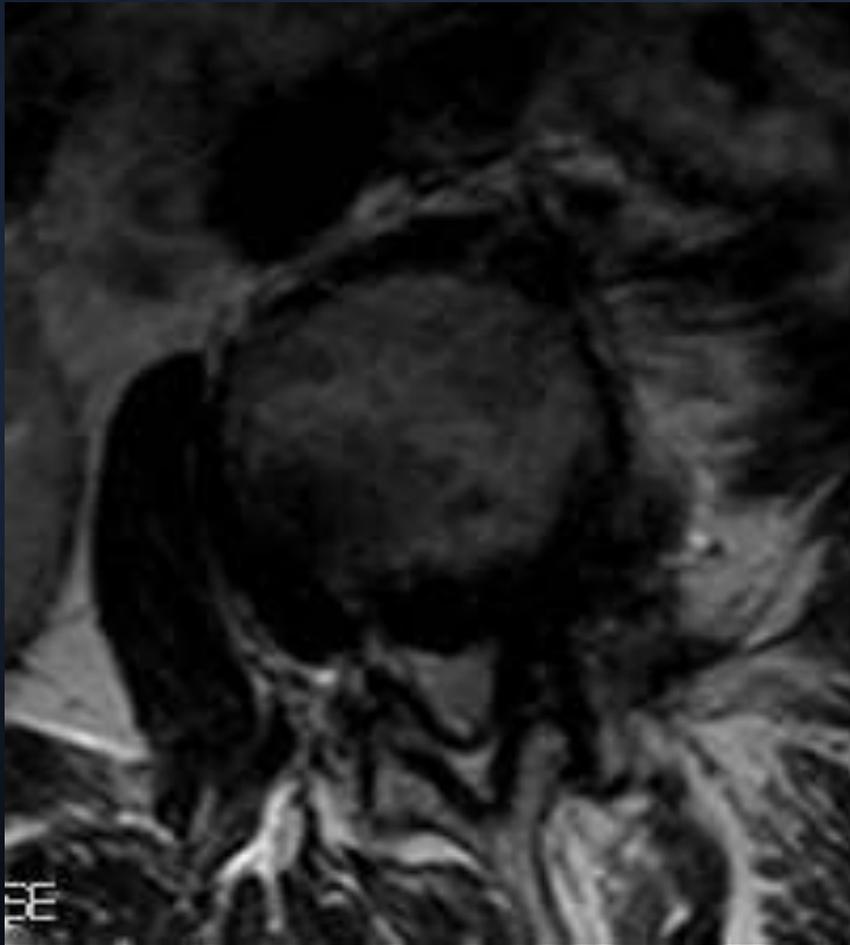


Lateral & Back

67 yo female w back pain, and neurogenic claudication



Pre op MRI



INTRA-OP



INTRA OP

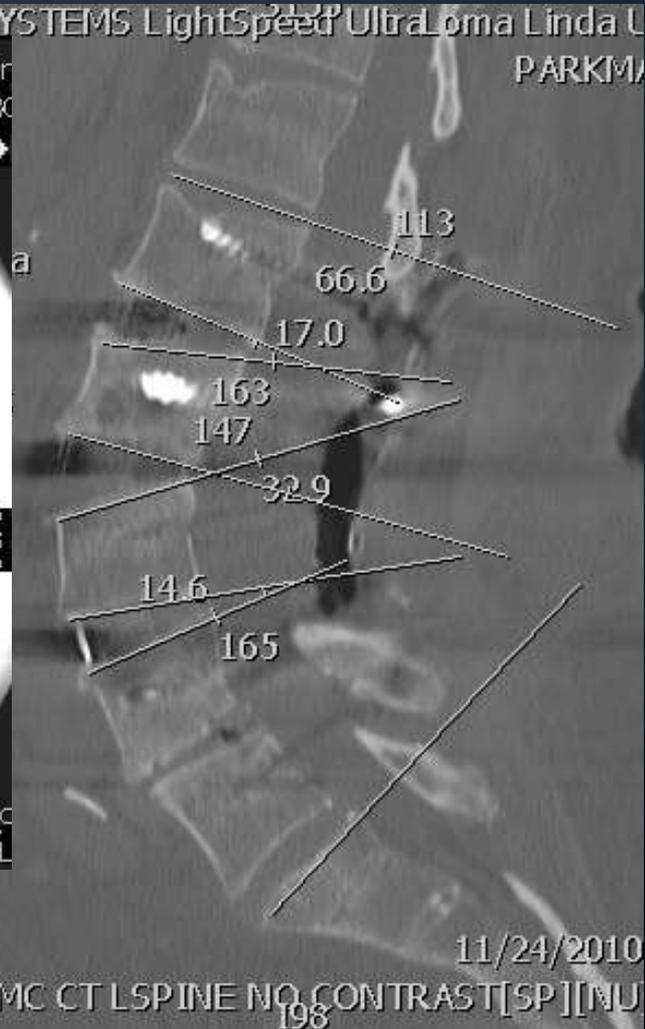








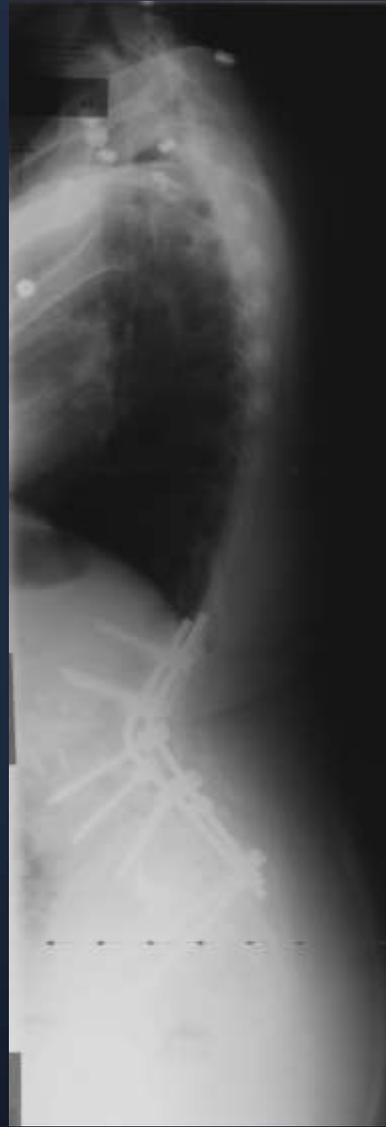
Lateral w ALL release/back



Complication

- Major complication 34 to 61%
- AVG EBL 1.5 to 3.5 Liter for PSO
- Death , blindness, Medical issues.
- Neuro deficit, Pseudarthrosis, PJK.

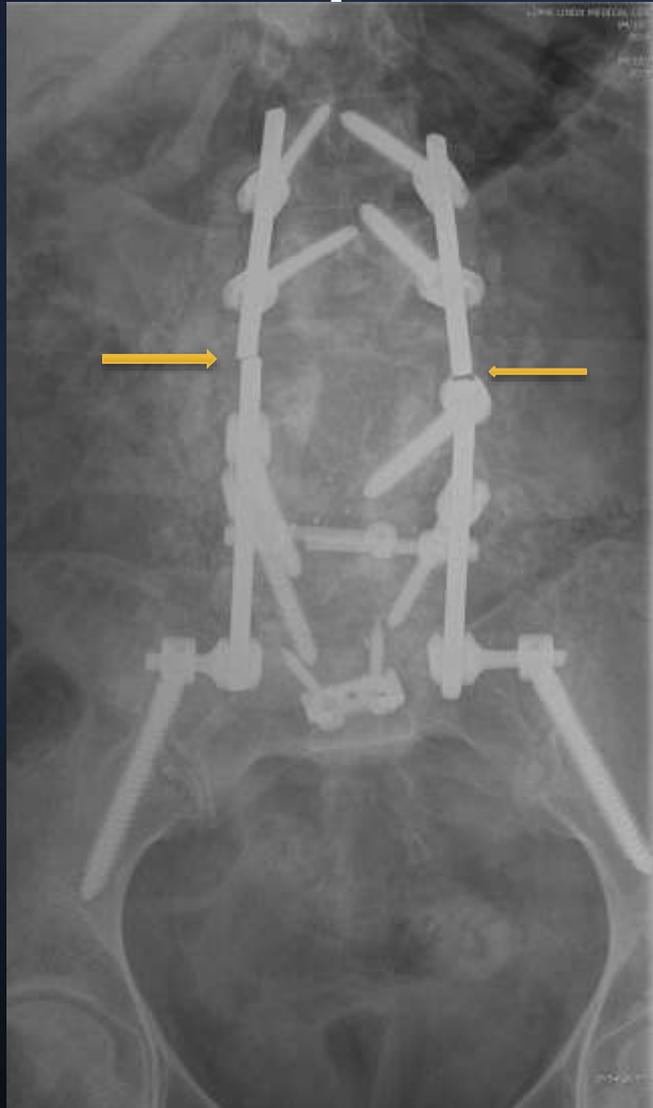
pseudarthrosis



Pseudarthrosis



pseudarthrosis

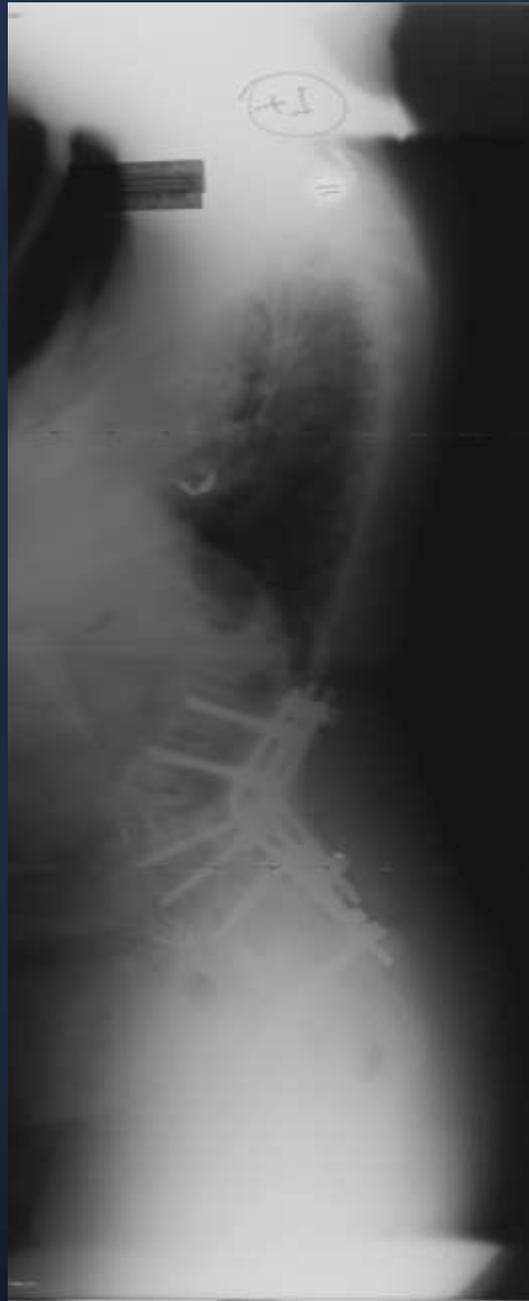
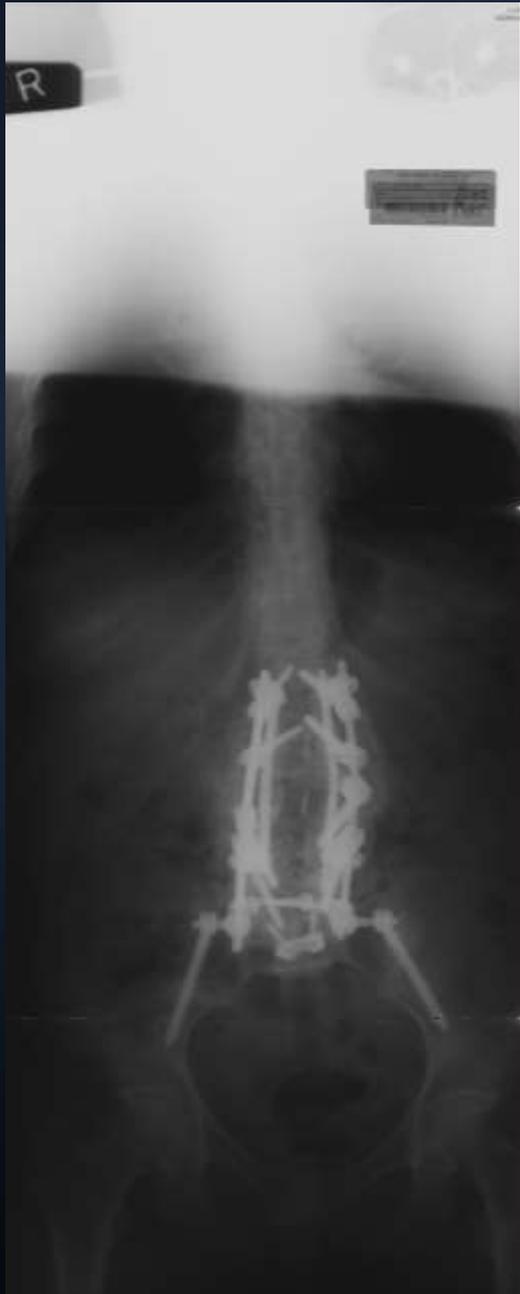


Pseudarthrosis



Pseudarthrosis





PJK/PJF



PJK/PJF

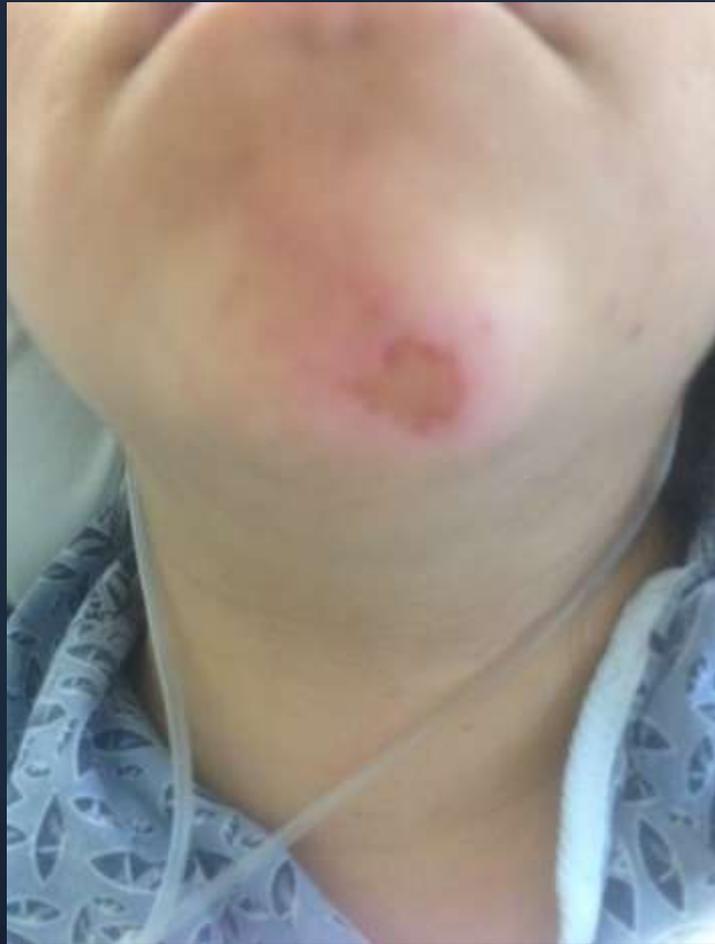






Over Correction





Conclusion



- Define the Problem.
- Know your osteotomy
- Look out for complication

Thank You

