

*4<sup>th</sup> International Congress on Early Onset Scoliosis (ICEOS)*  
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# **How to Do Your First Growing Rod - Technique**

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**Cleveland, Ohio**





# Case Medical Center Cleveland, Ohio



# Possible Indications for Surgery

## Preoperative curve magnitude

- > 60 - 70 degrees
- Better results with smaller curves

## Failed non-operative treatment

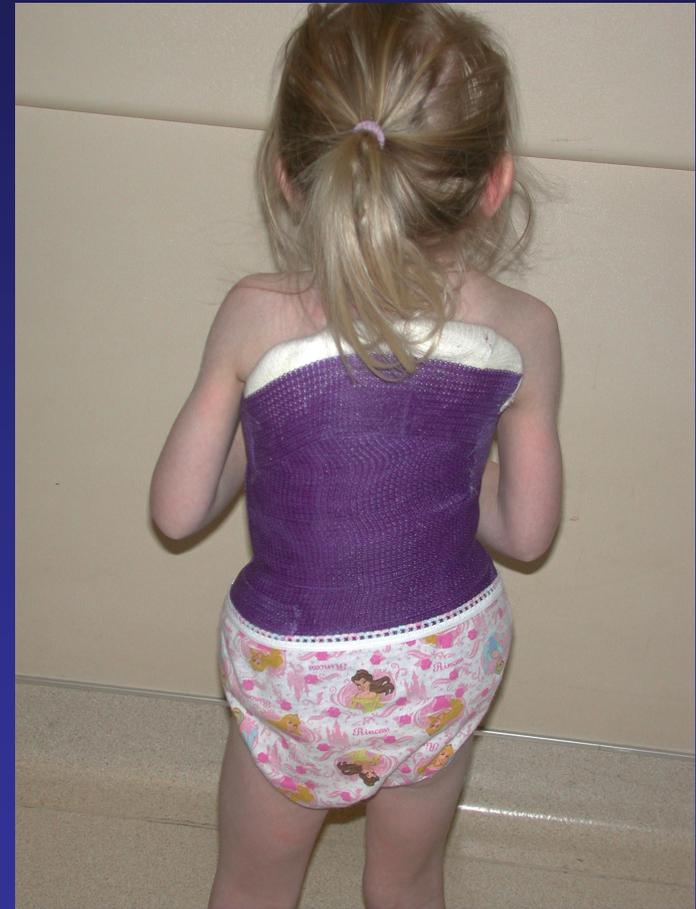
- TLSO
- Serial Risser casts

## Health problems that would benefit from improved spinal alignment

- Pulmonary, GI, etc



# Serial Risser Casts



# Anterior Release vs Traction

## Anterior release controversies

- Short release & fusion = more crankshaft?
- Long term effect on PFT's?

Intraop. traction radiographs better than preop. side bending radiographs

- Eliminates patient cooperation
- More accurate foundation selection



# Expandable / Growing Rod Techniques

Single rod - Thompson

Dual rods - Akbarnia

- Luque “trolley” - Luque
- Shilla procedure - McCarthy

VEPTR - Vertically Expandable

Prosthetic Titanium Rib - Campbell

- Not truly a growing rod system



# Technical Problems

## Size of anatomical structures

- Laminae
- Pedicles

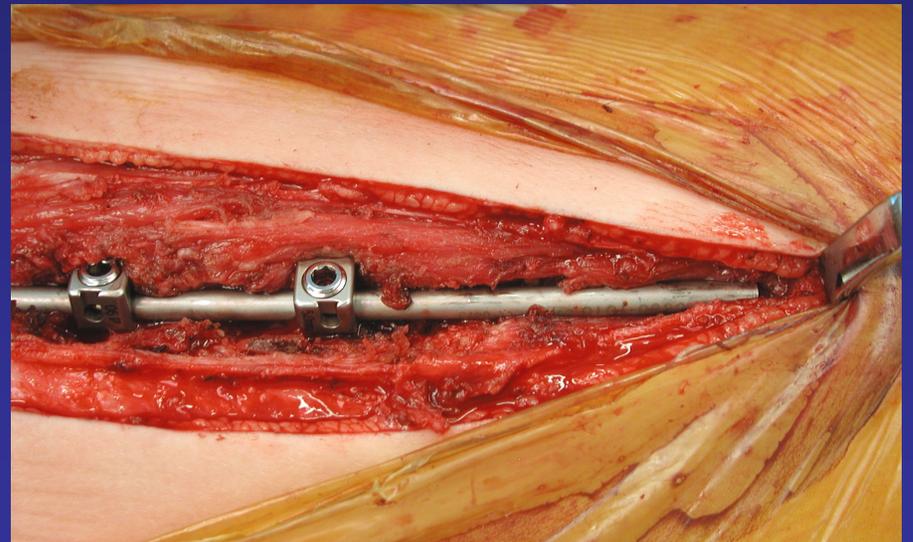
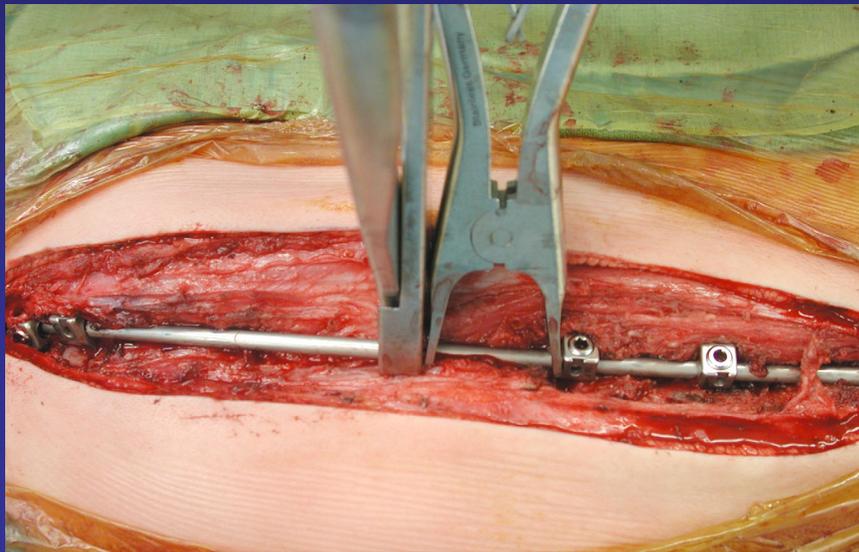
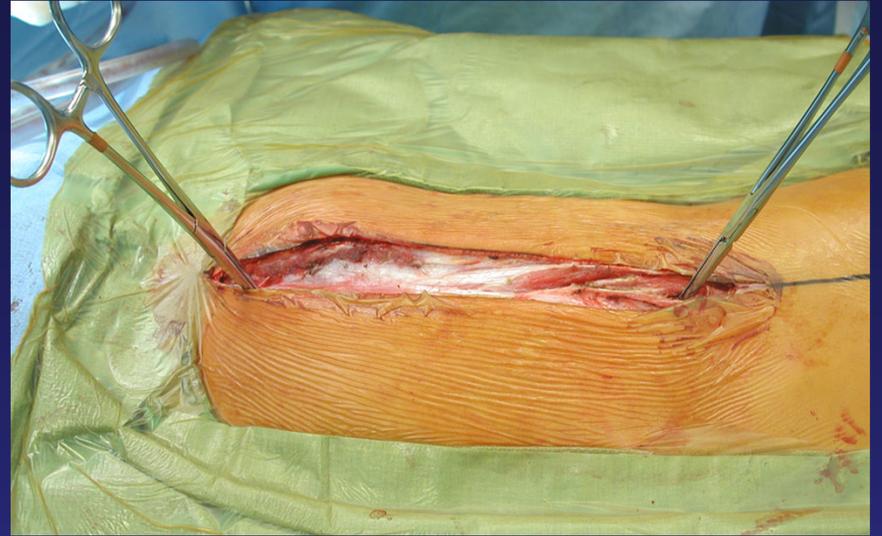
## Bone density / strength

## Age

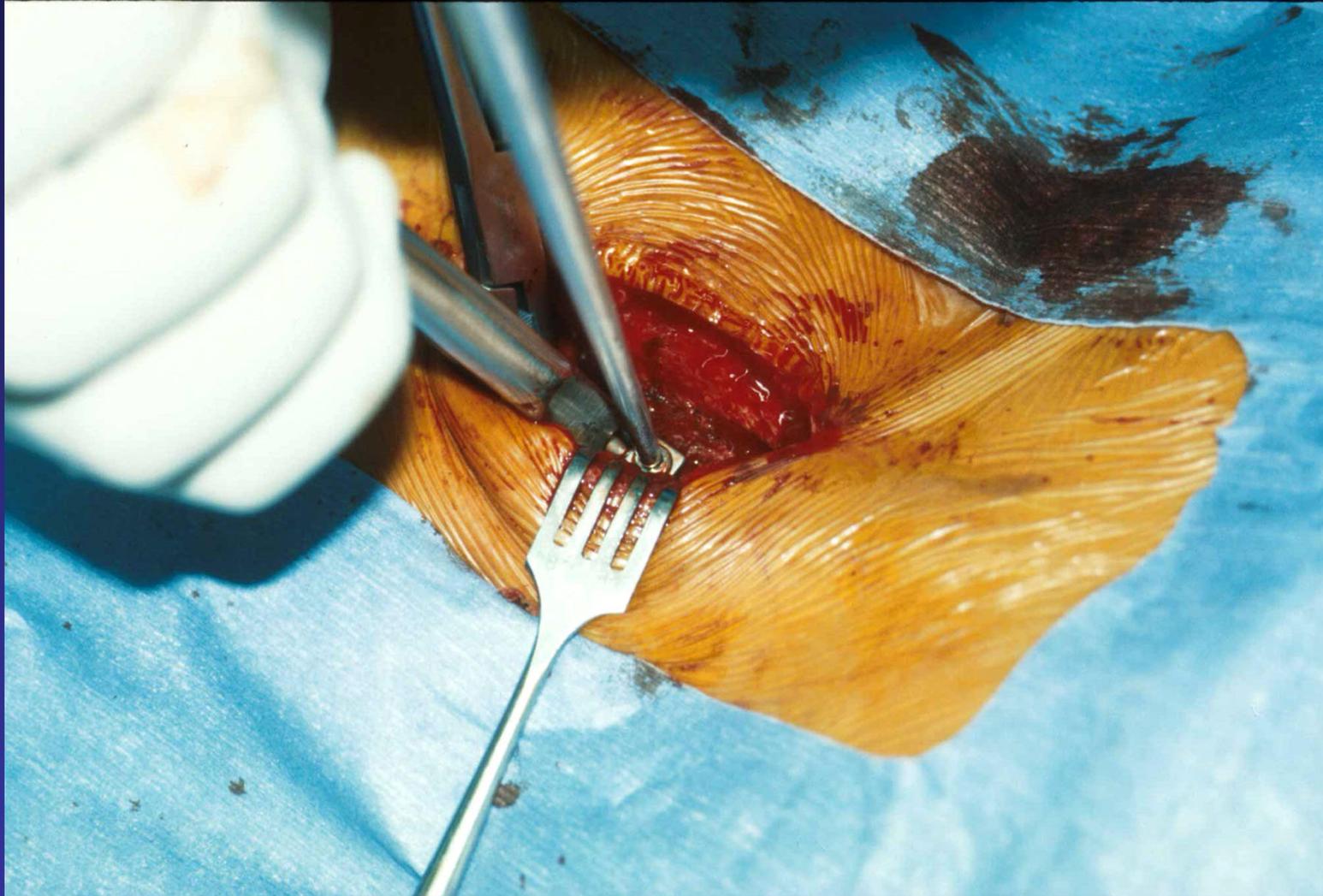
- Younger = more lengthenings = more complications



# *Operative Technique*



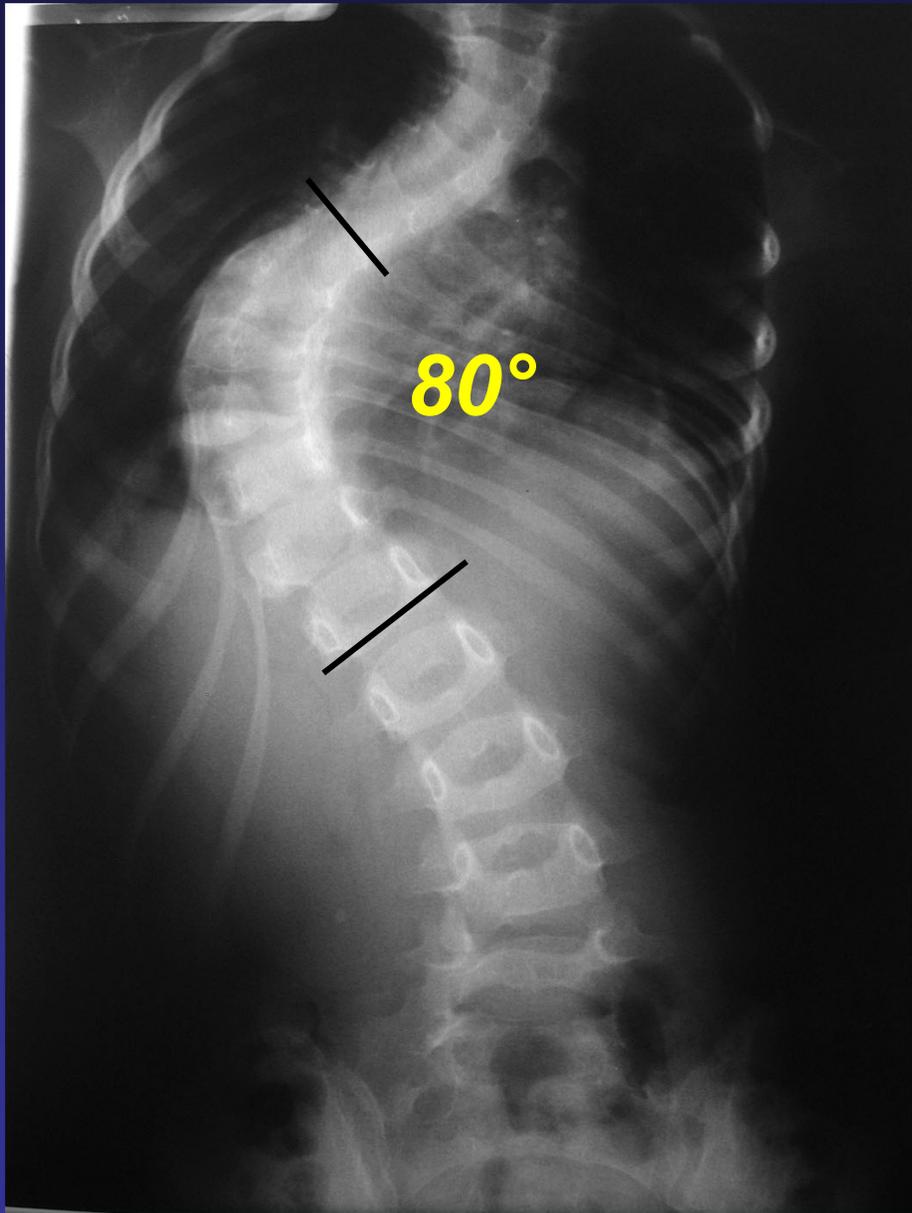
# *Lengthening Technique*





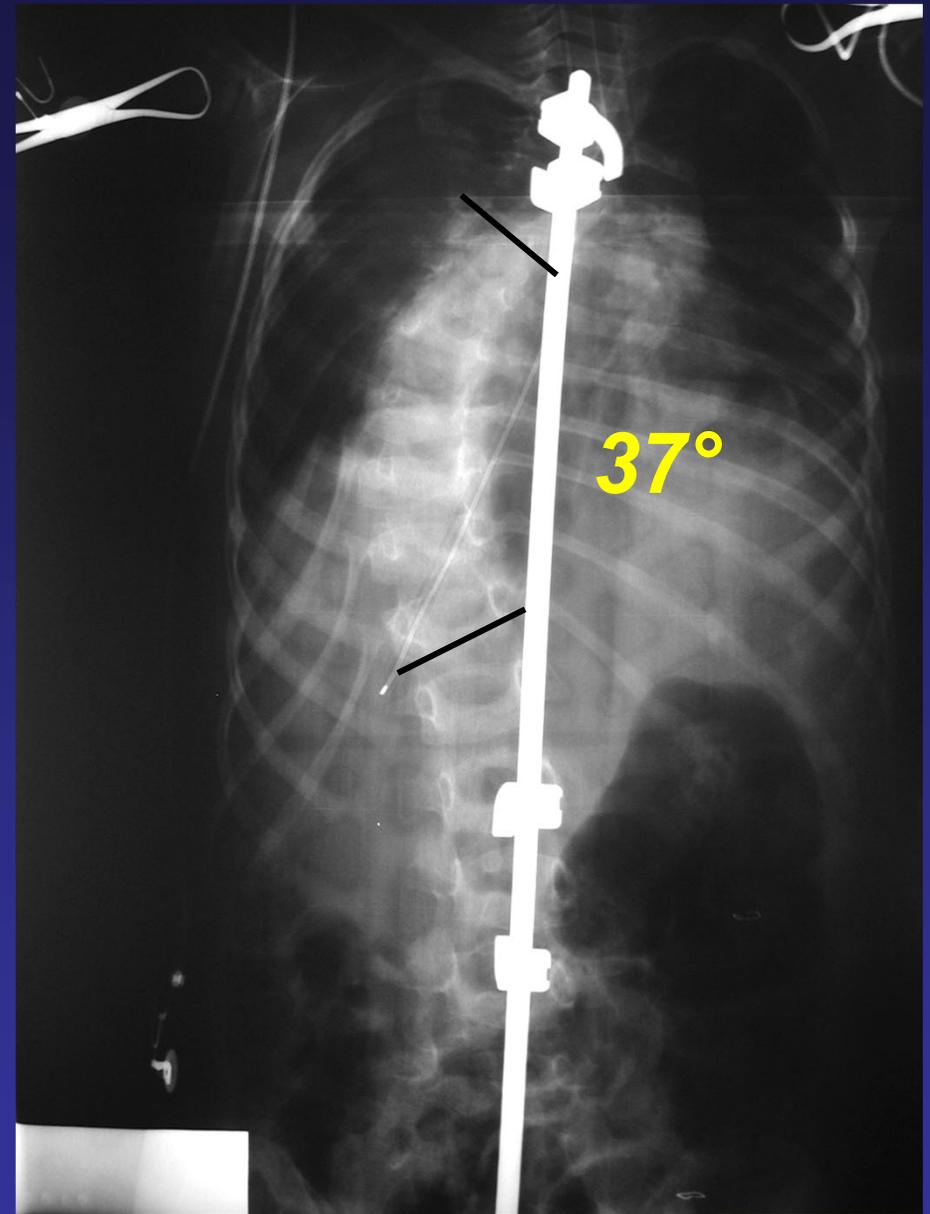
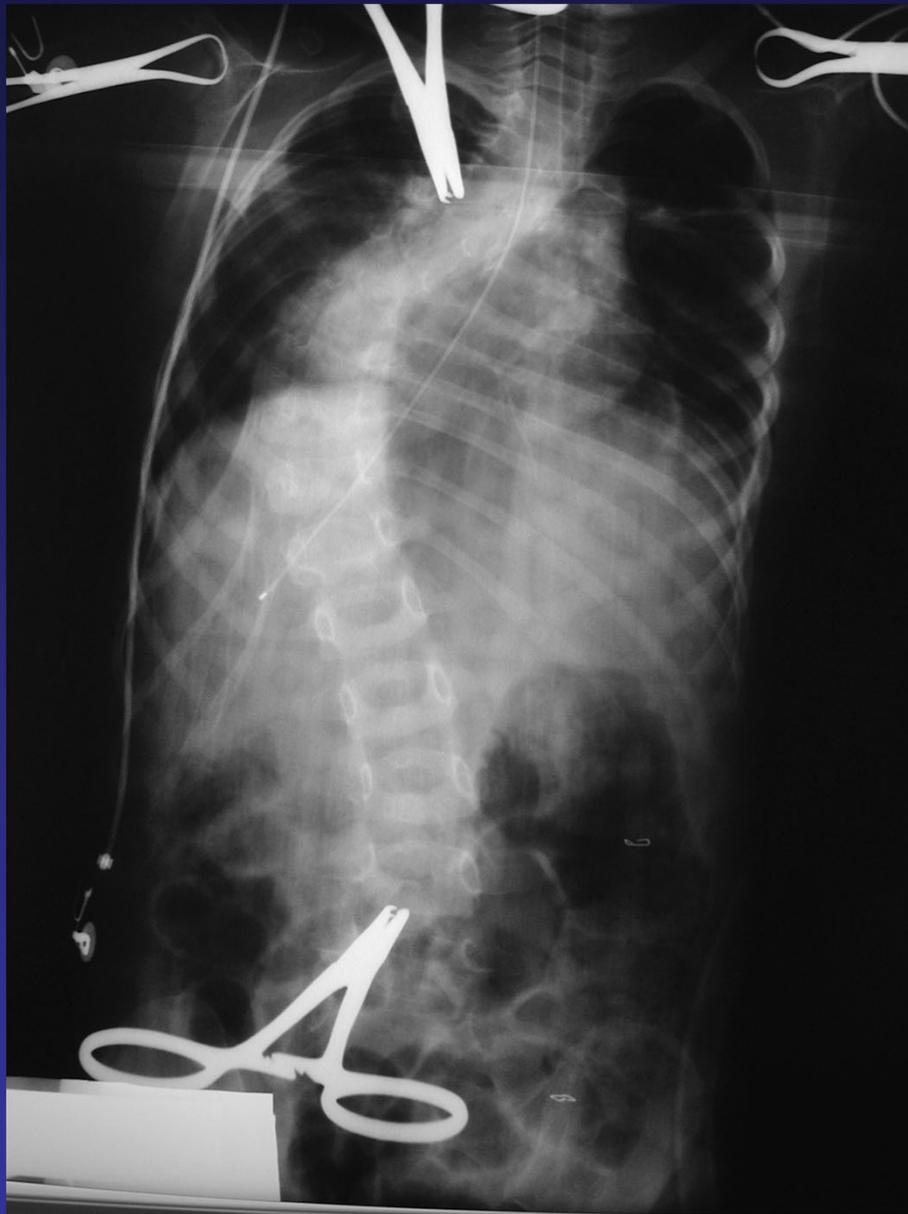
**MC 3+6 3-01 Infantile Idiopathic Scoliosis**





***MC Preoperative radiographs 2-01***





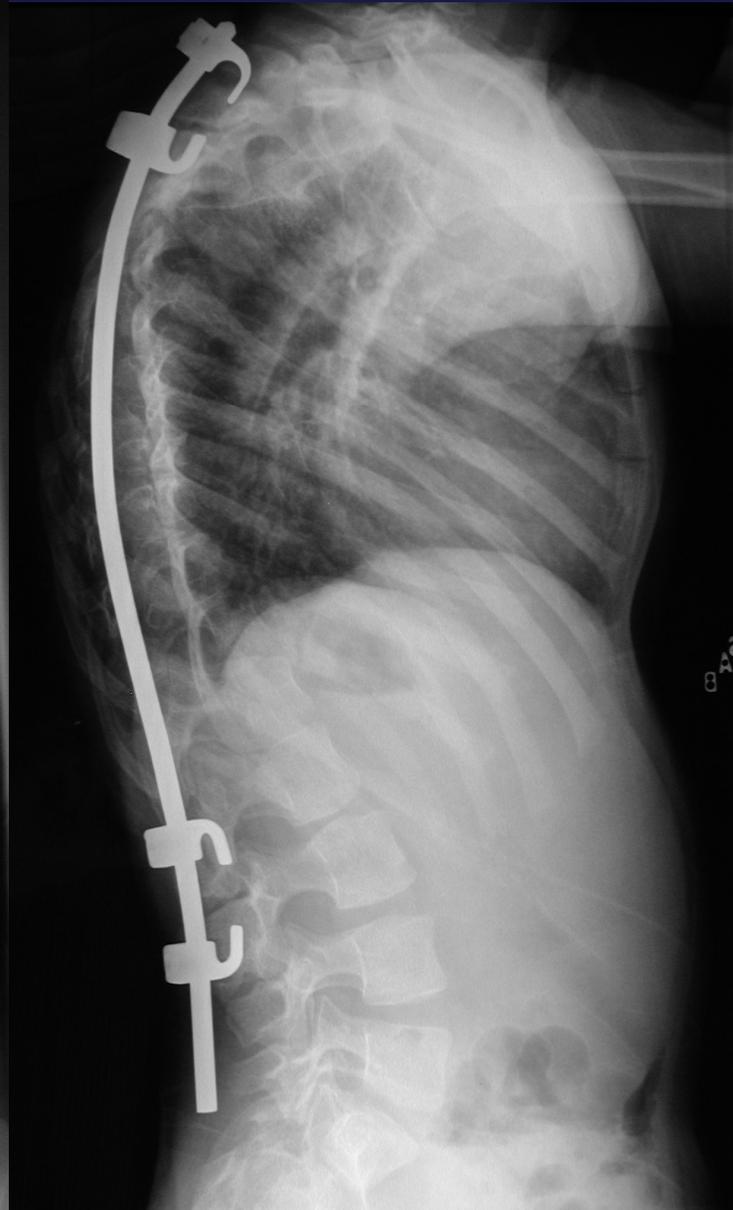
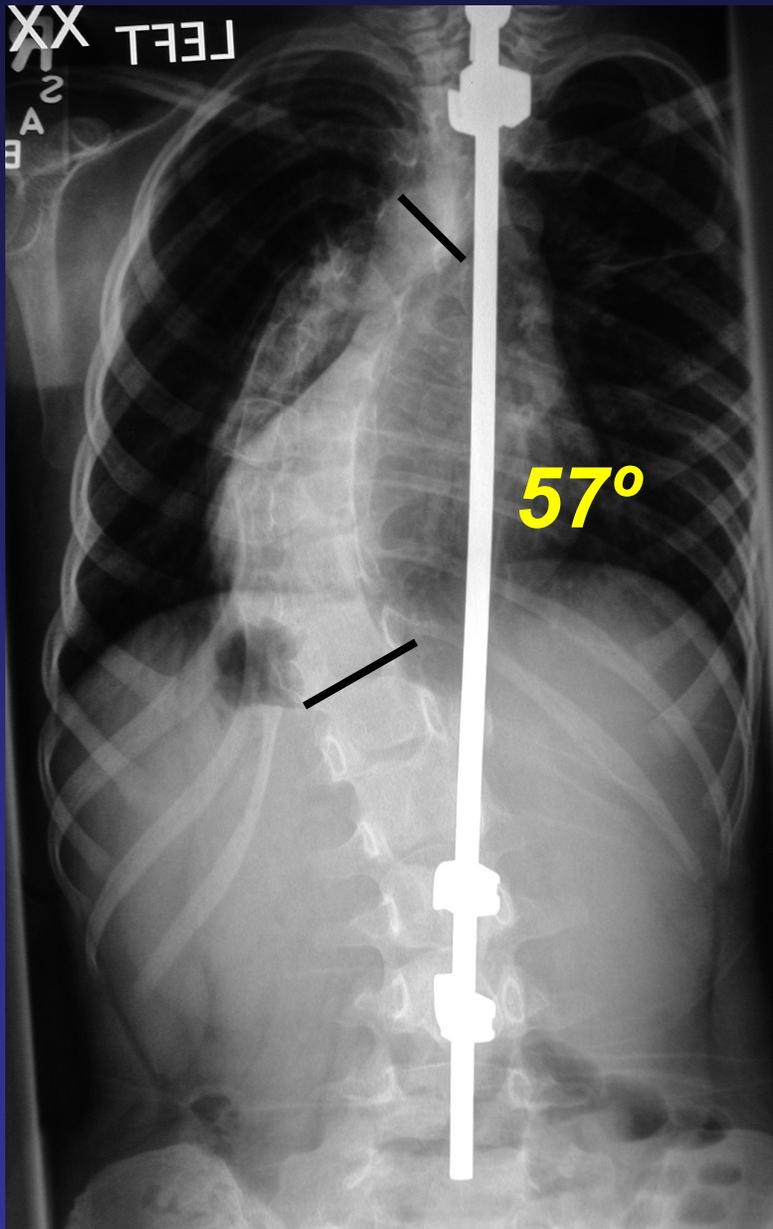
***Intraoperative radiographs***





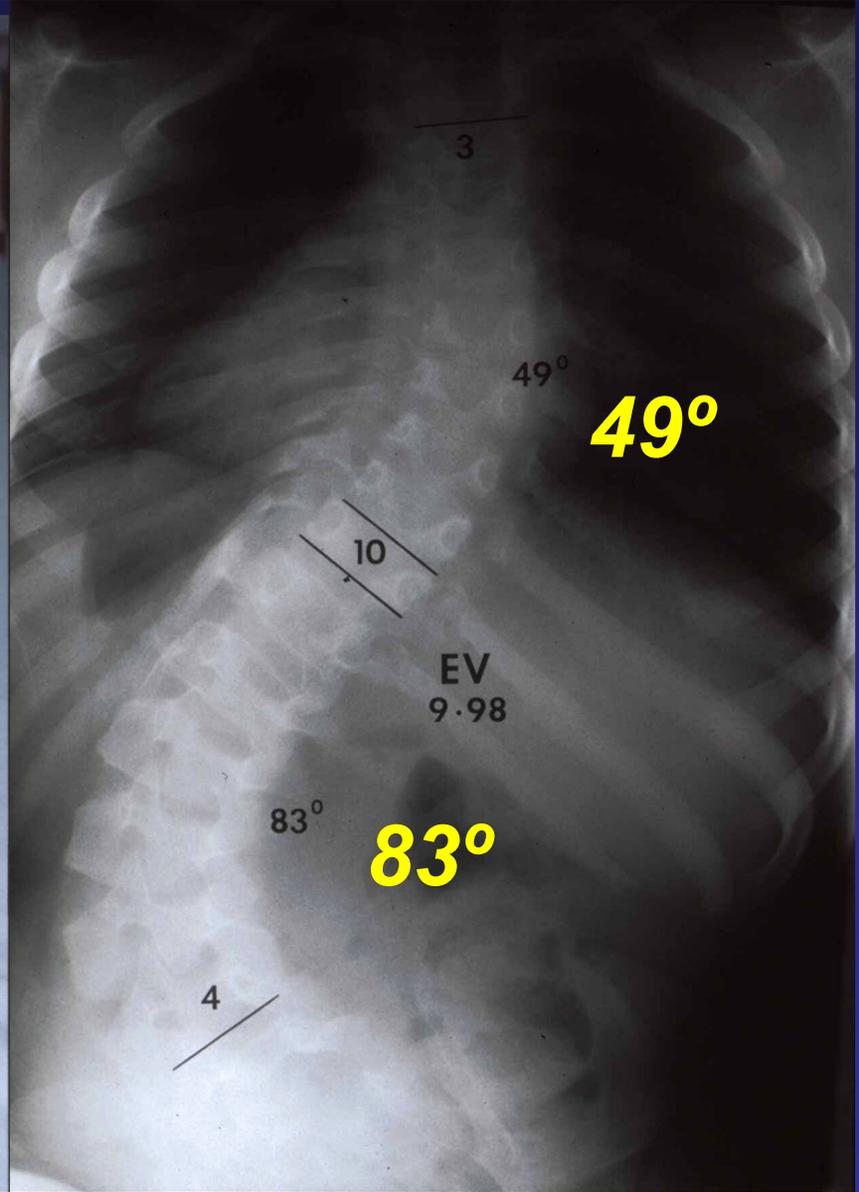
***MC 3+8 2 mos s/p submuscular rod***





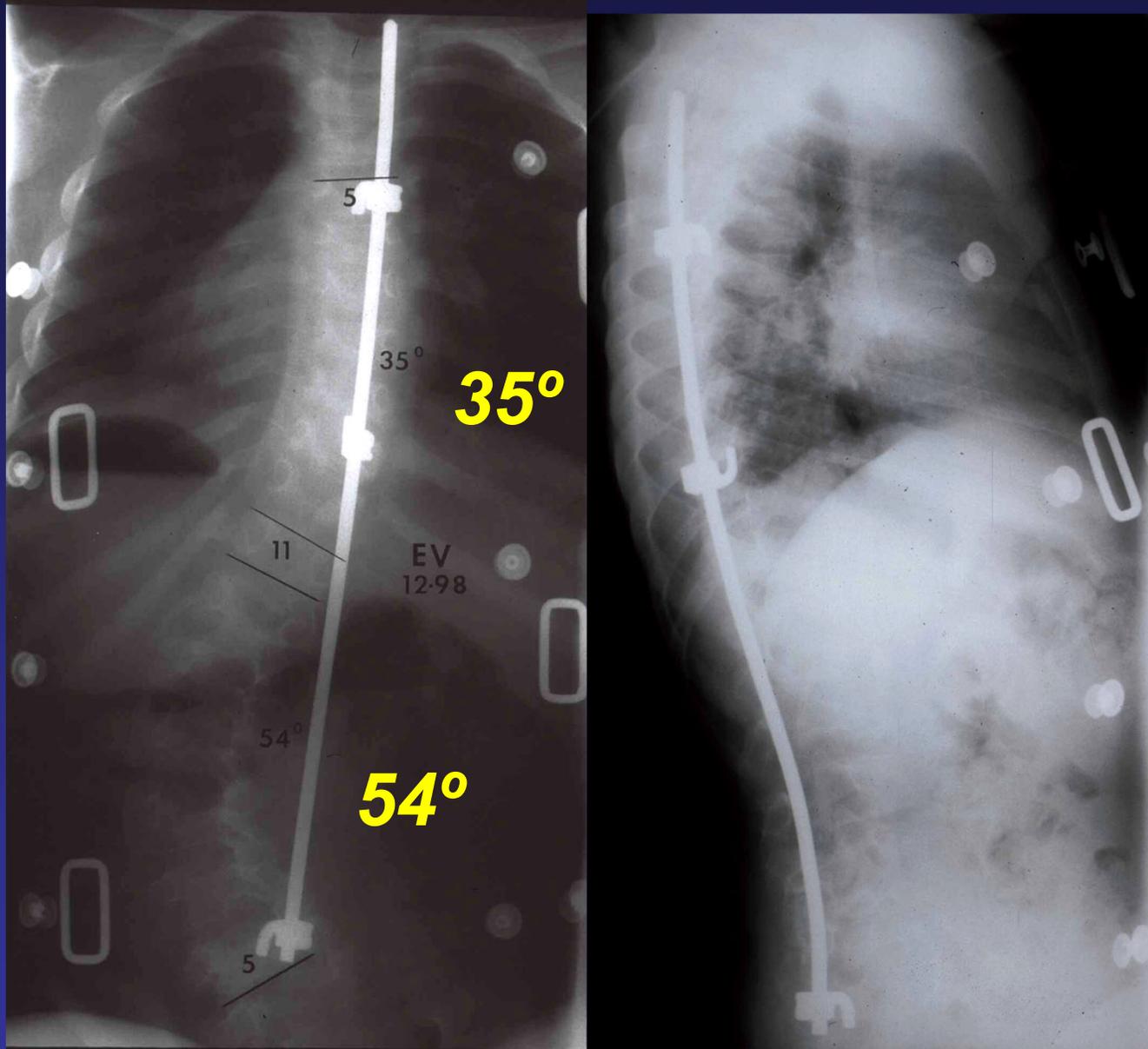
**MC 6+9 yrs 2 yrs postop 10-03**





**7+5 yo female SCIWORA +  
hypophosphatasia 9-98**

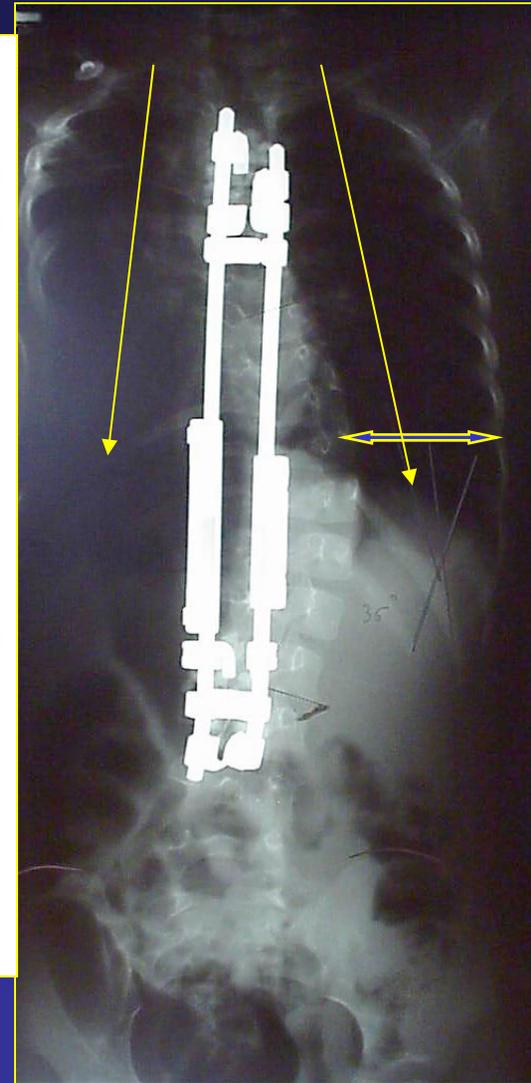
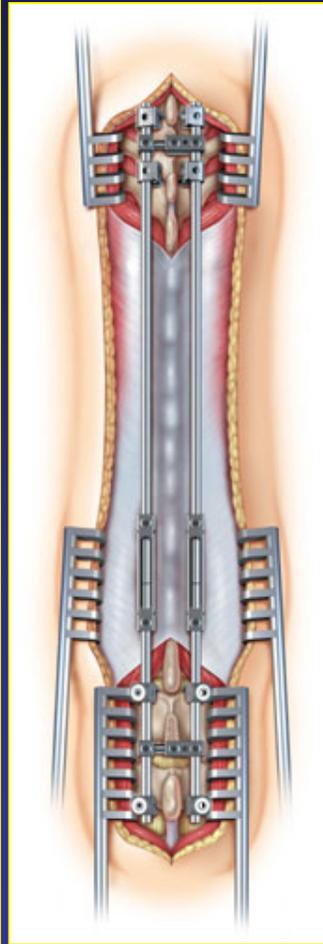
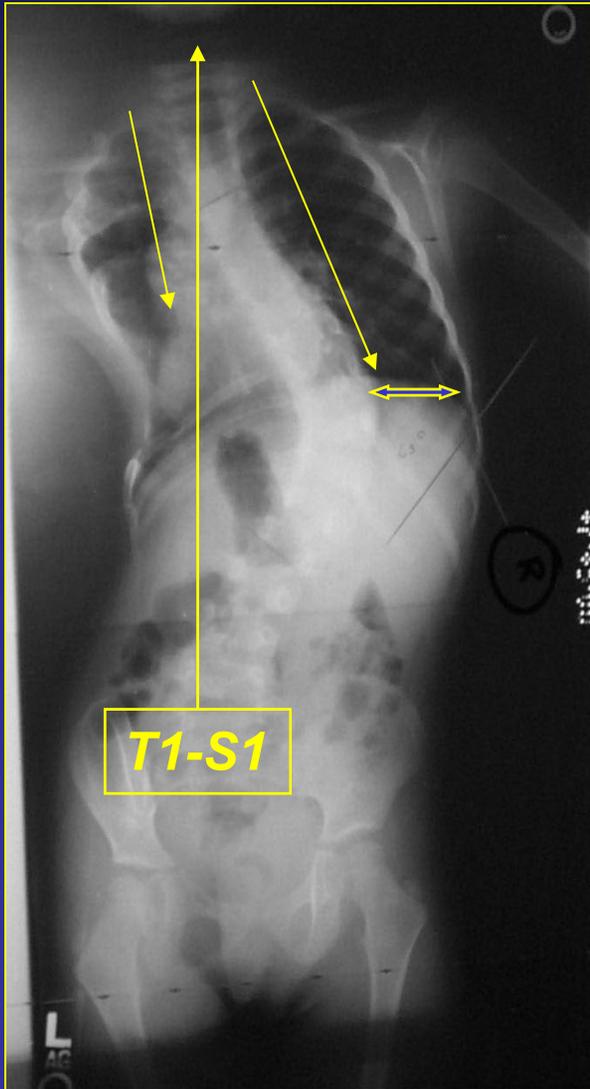


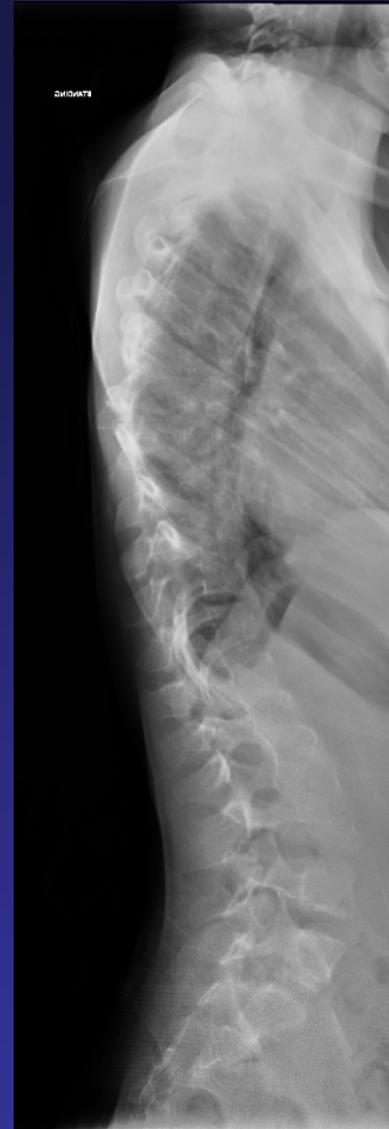
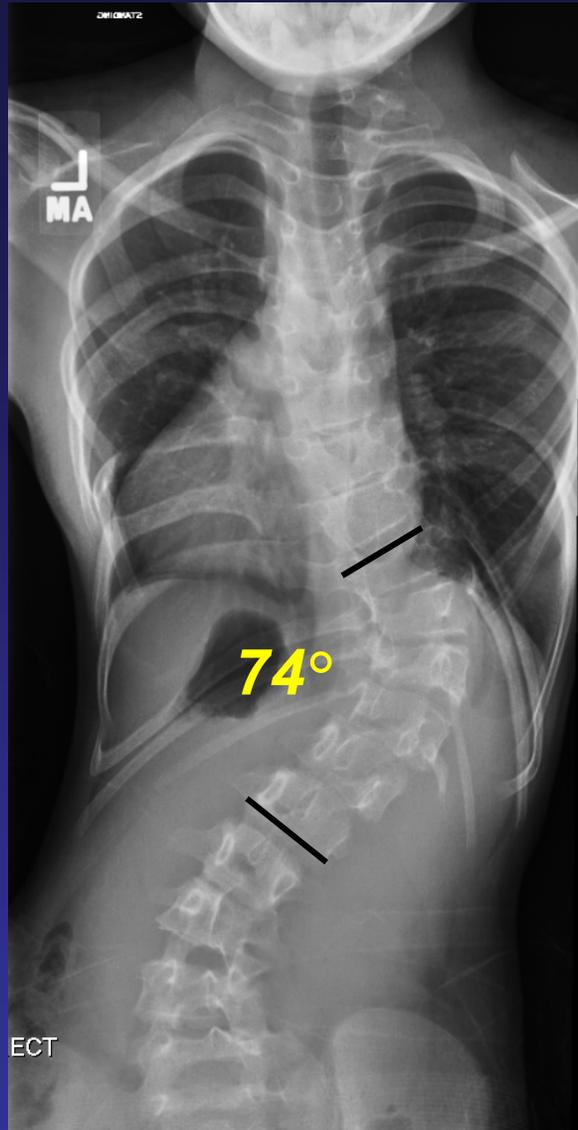


**3 mos postoperative 12 - 98**



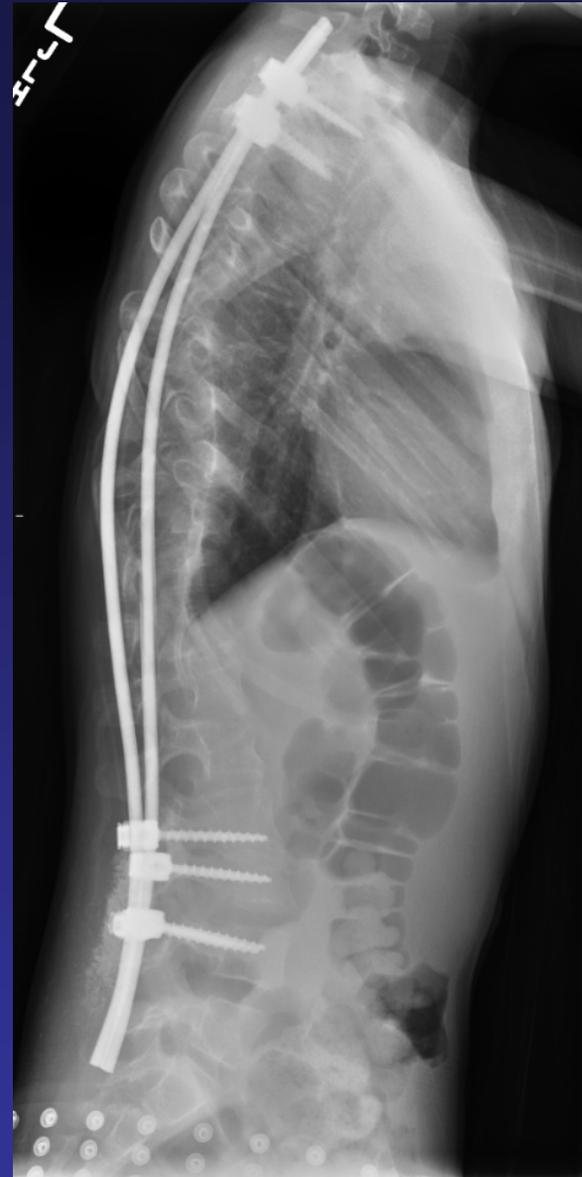
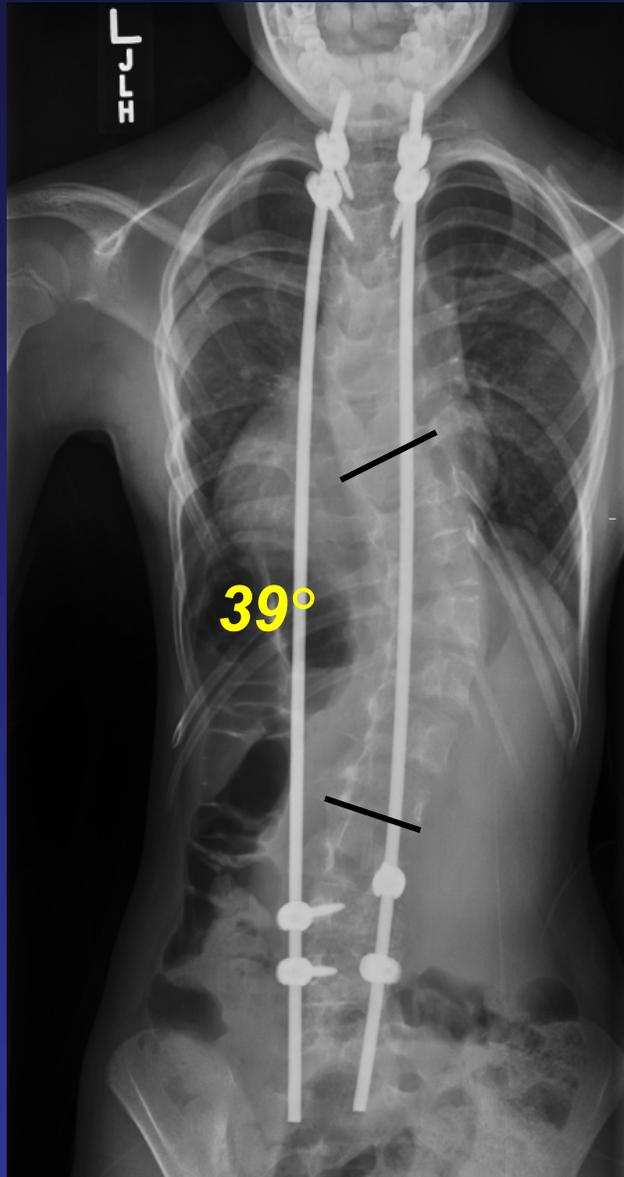
# Dual Rod Technique





**MMcC 8+11 female 8-09**  
**Spondylothoracic dysplasia**

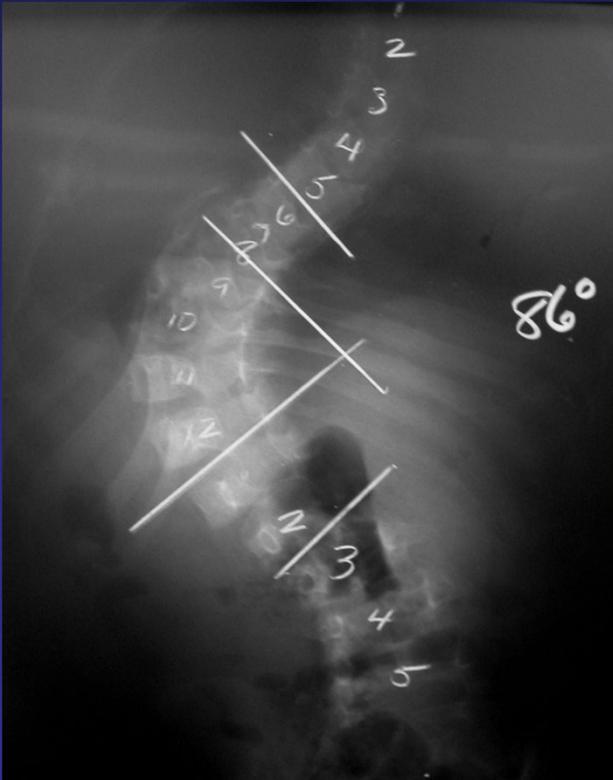




**MMcC 9+1 years 10-09**



# Shilla Procedure

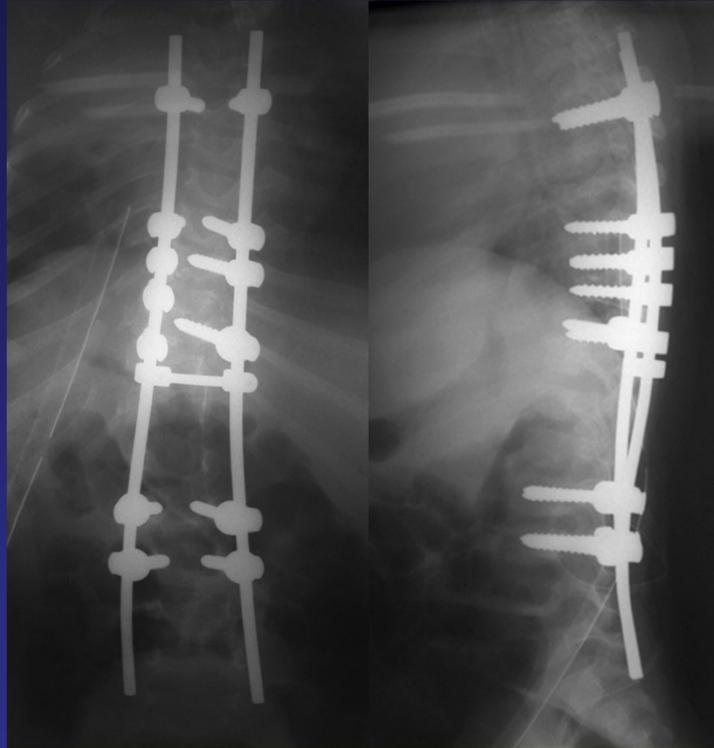


***JH 2+10 yr female***  
***Infantile Idiopathic Scoliosis***

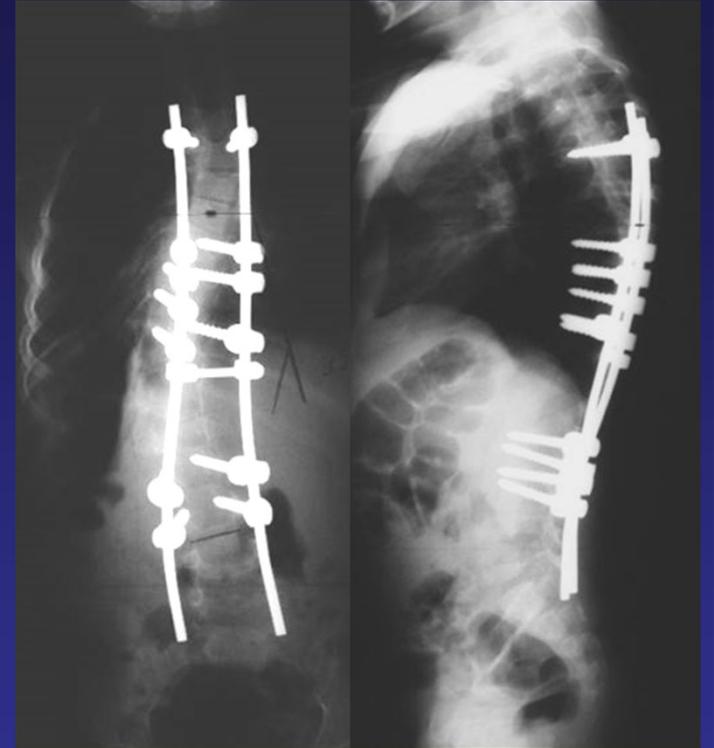




*Preop*



*Postop*



*2 yr postop*



## *Preop*



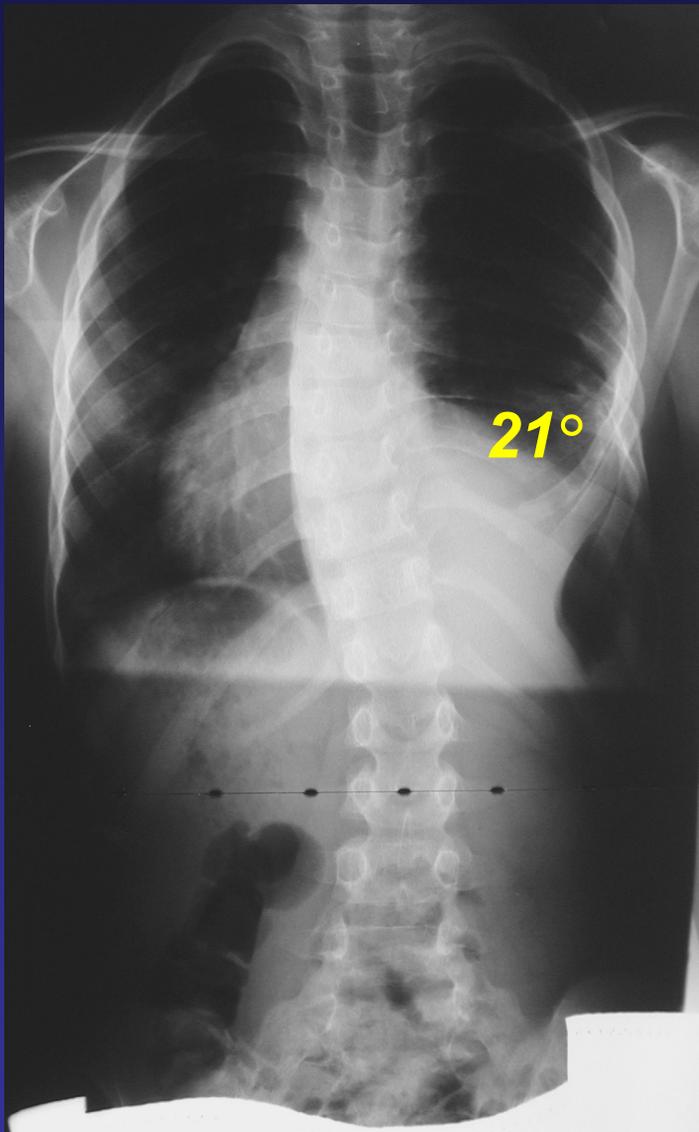
## *2 Yr Postop*



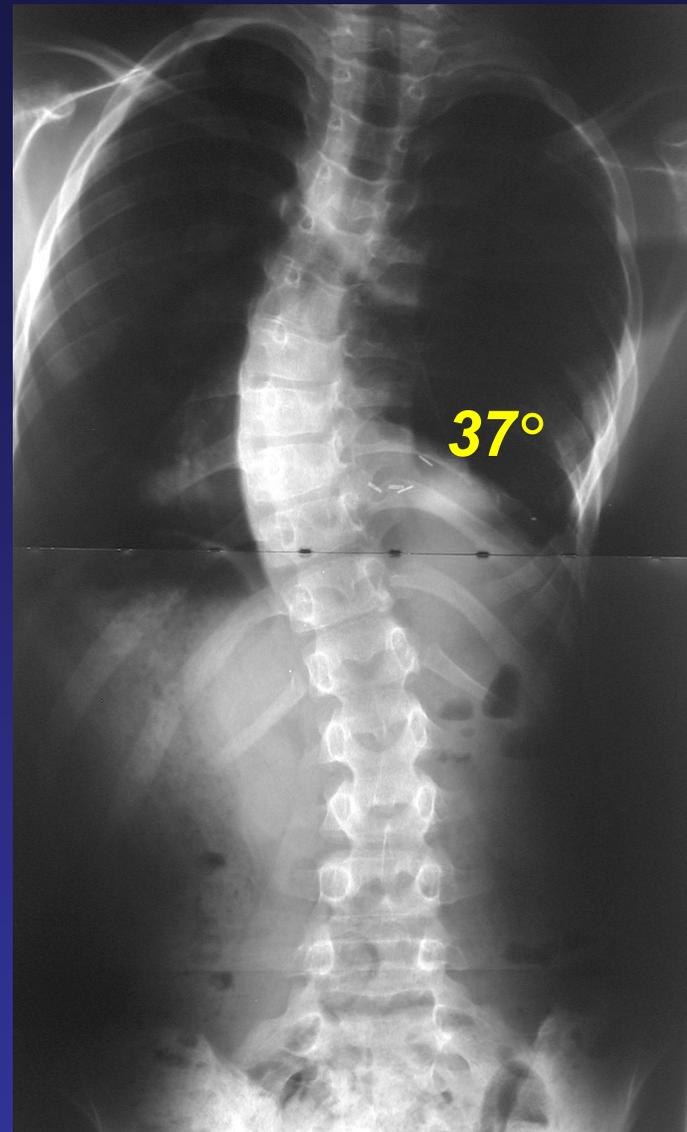


***VEPTR***  
***Vertically Expandable Prosthetic***  
***Titanium Rib***



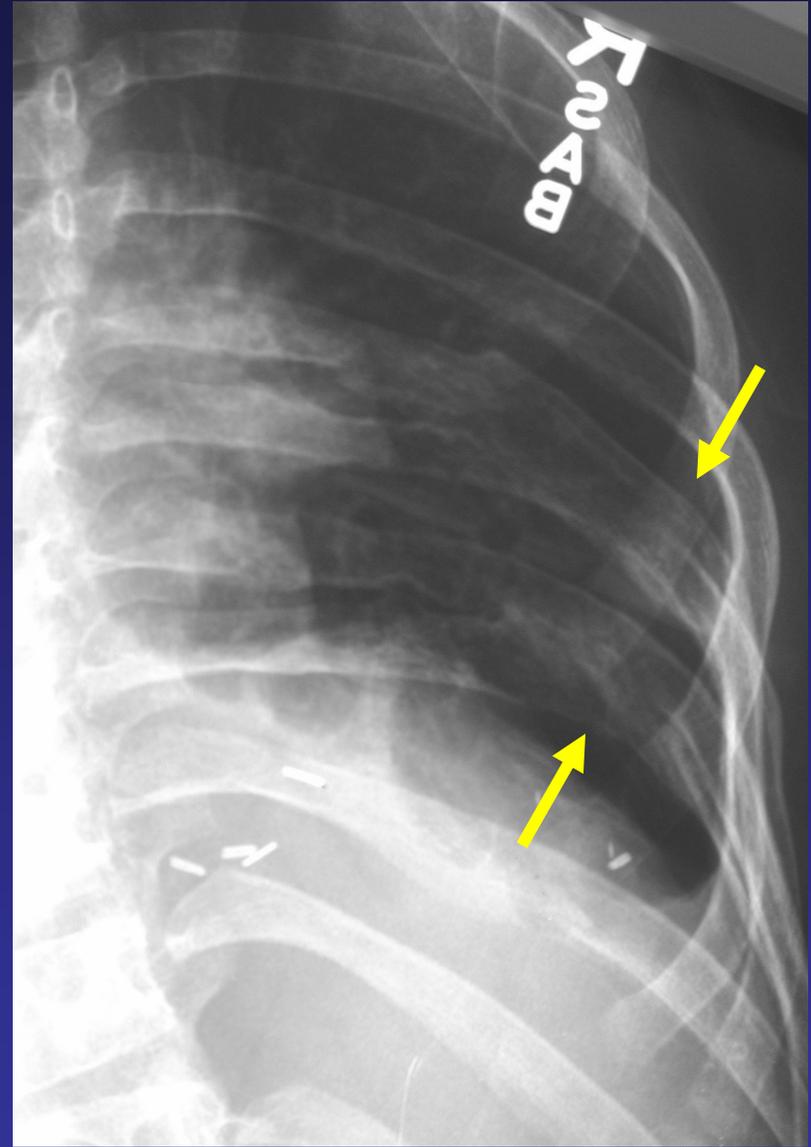
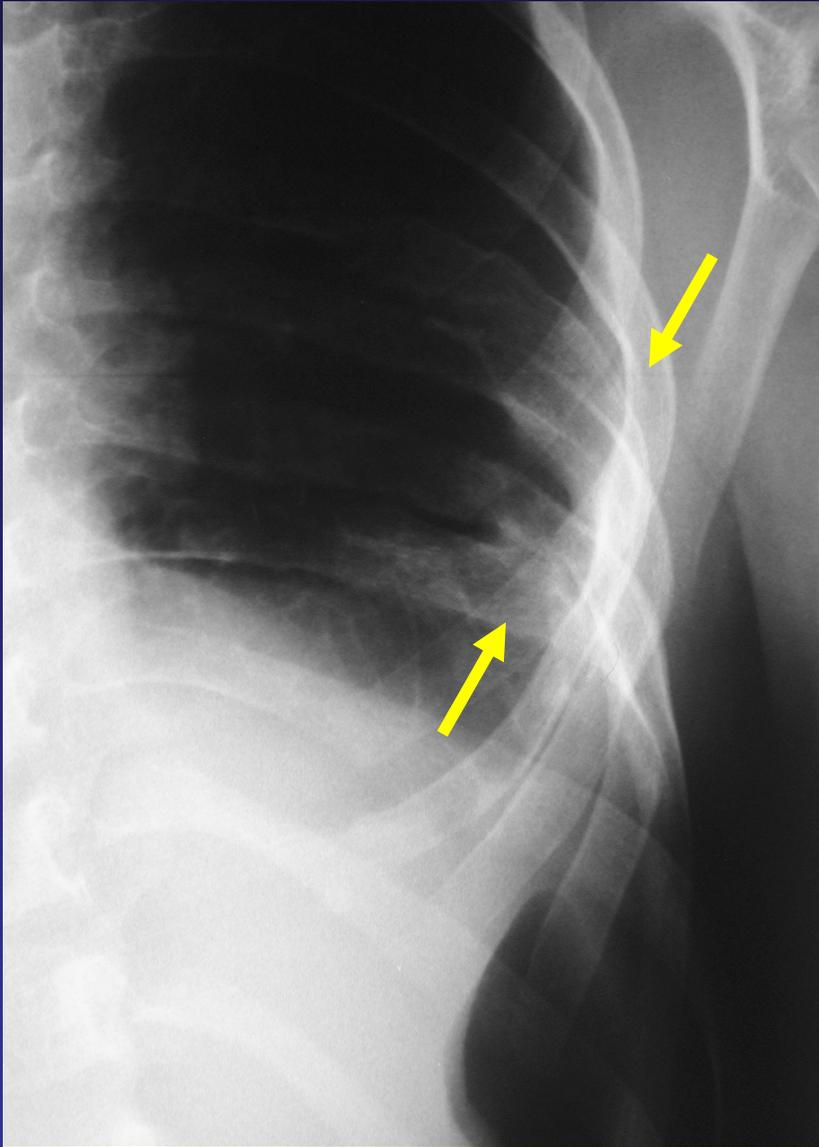


**7+0 yrs**  
**3-03**



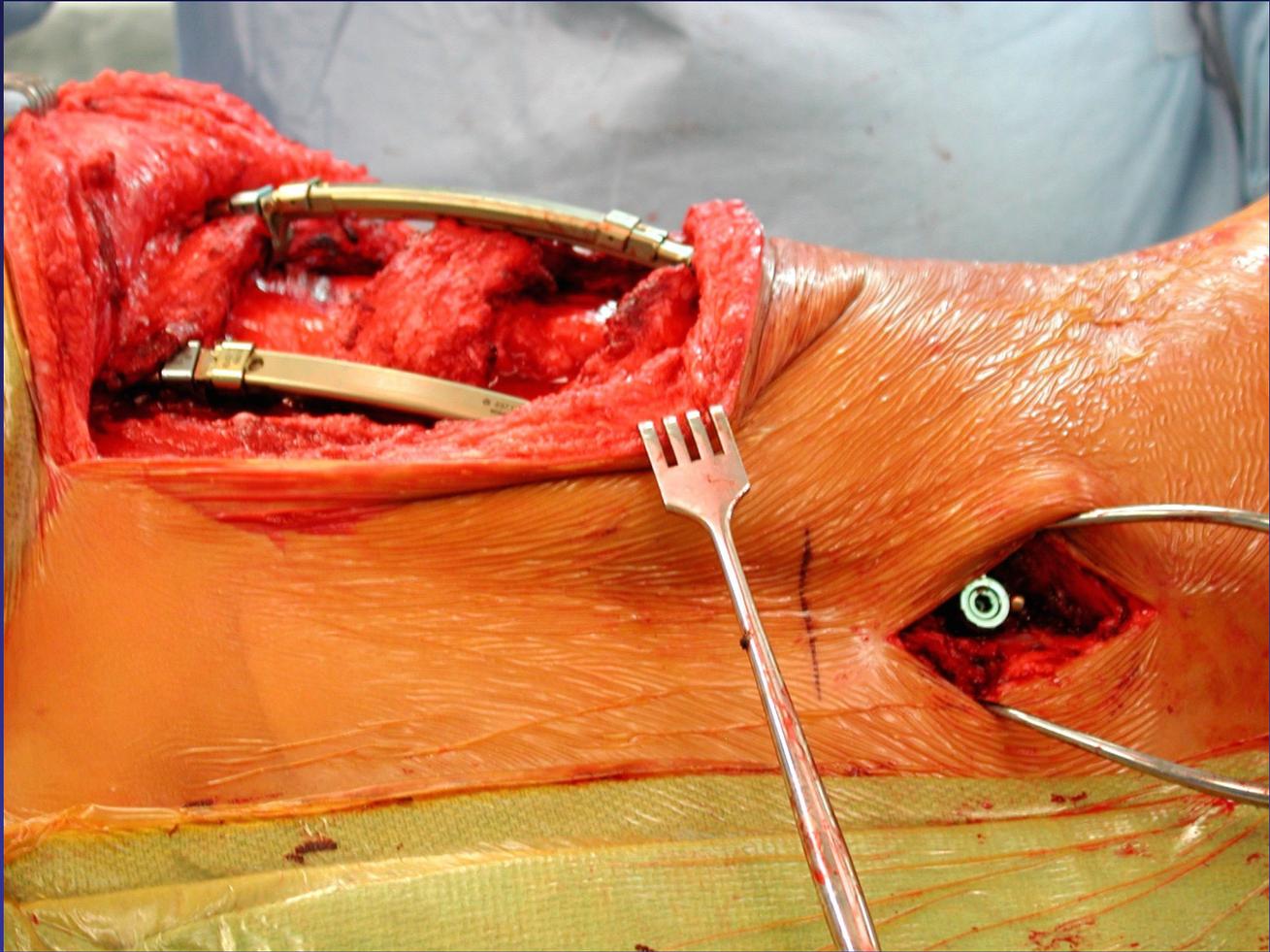
**10+4 yrs**  
**7-06**

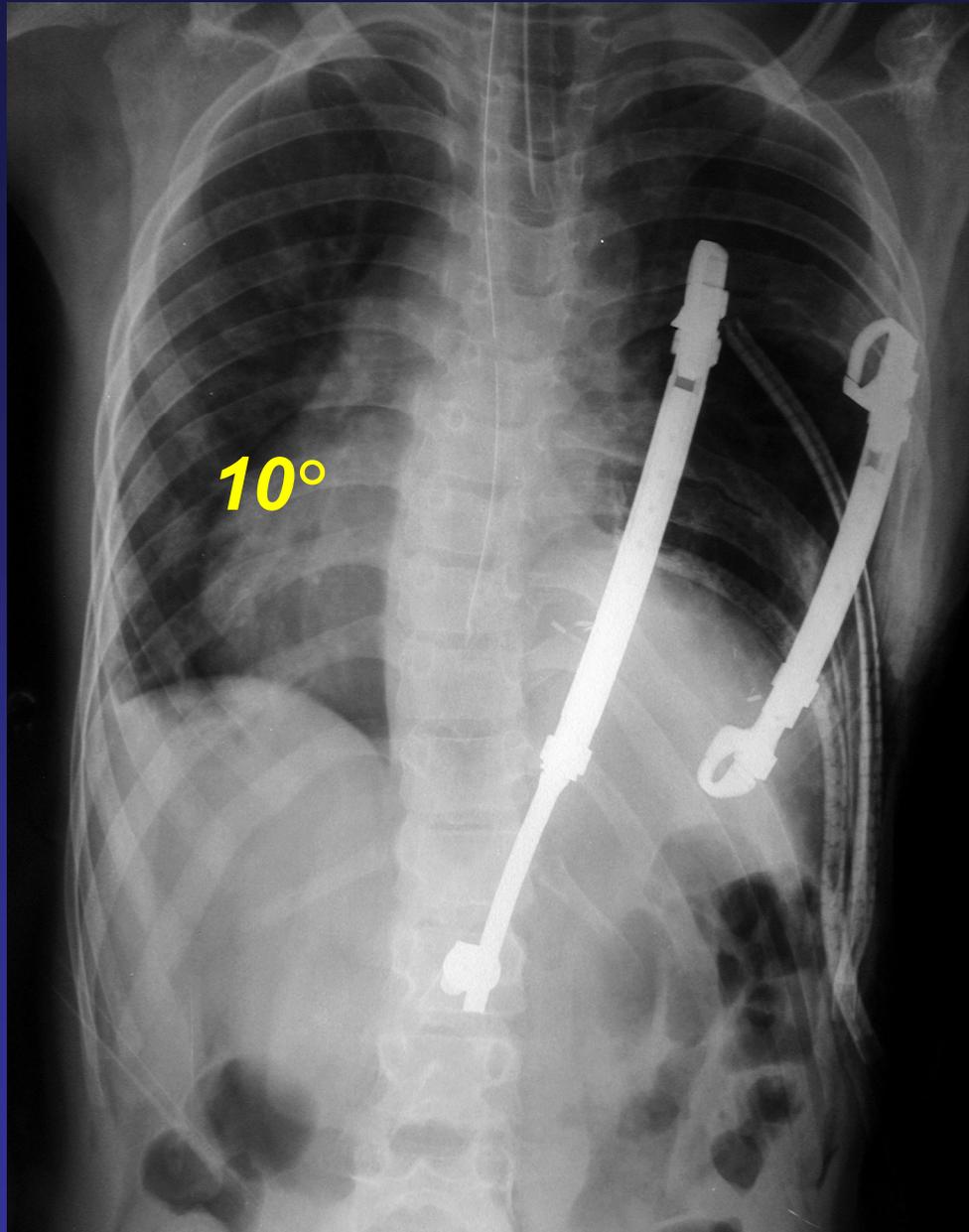




***Two pair of fused ribs***







*Immediate postoperative radiograph*



# Conclusions

**Delay surgery as long as possible**

- **Risser casts**

**Dual rods with hybrid construct  
(thoracic hooks and lumbar pedicle  
screws) best for growing rod  
instrumentation**

**Future options**

- **Externally expandable rods**





***Thank You***

