

4th International Congress on Early Onset Scoliosis (ICEOS)
Toronto, ON
November 19-20, 2010

How to Do Your First Growing Rod - Technique

George H. Thompson, MD
Director, Pediatric Orthopaedics
Rainbow Babies and Children's Hospital
Case Western Reserve University
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

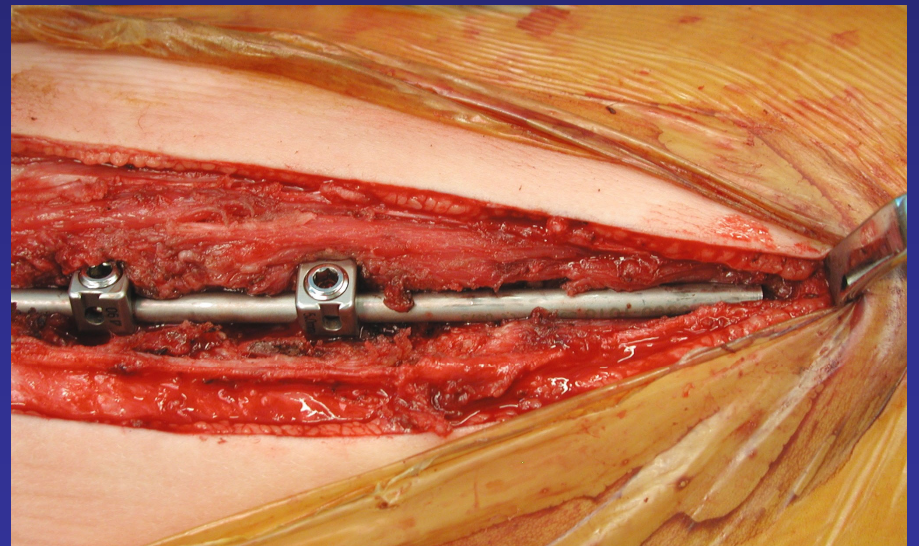
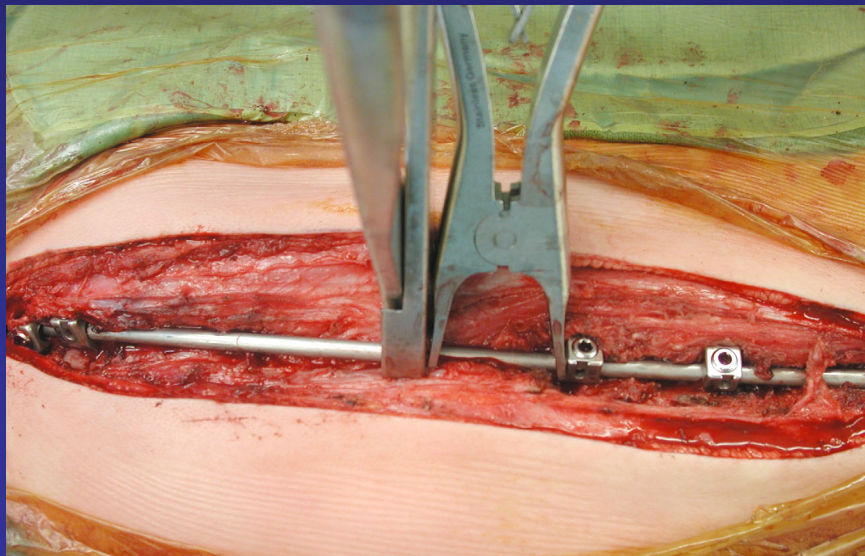
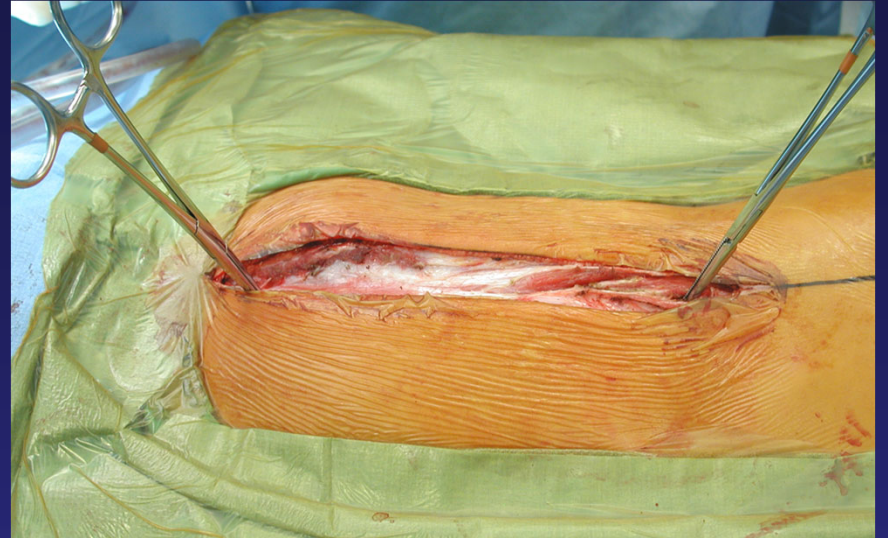
Bone density / strength

Age

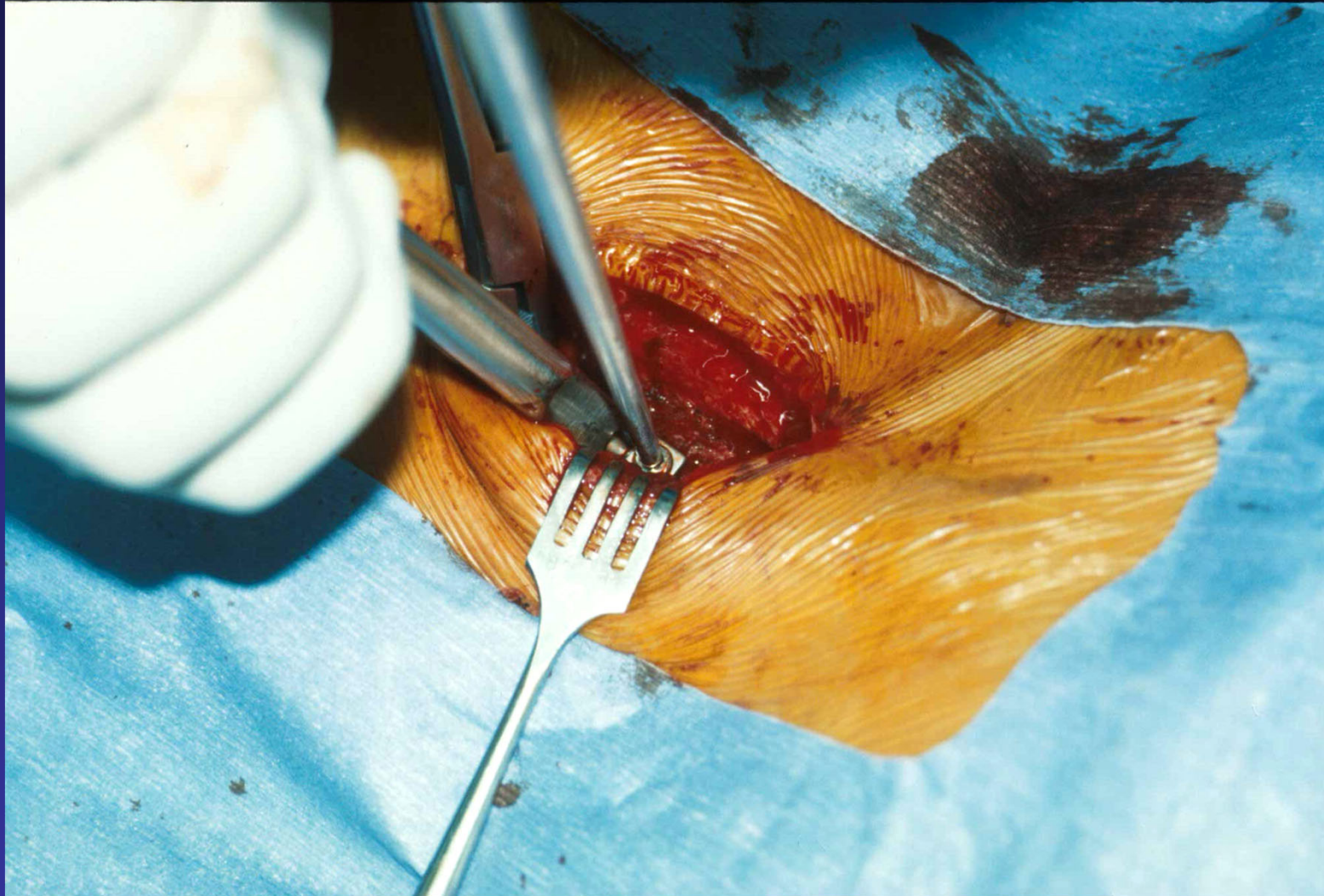
- Younger = more lengthenings = more complications



Operative Technique



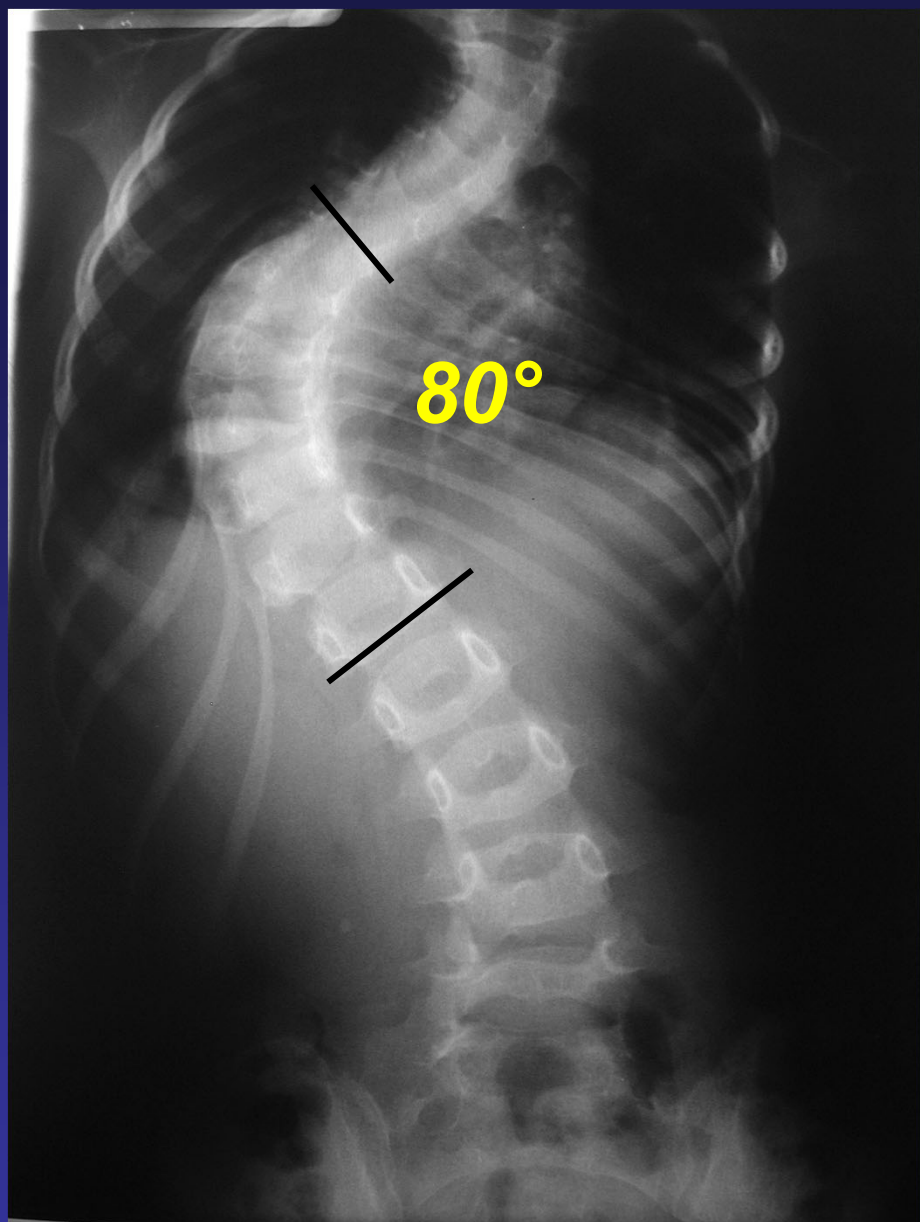
Lengthening Technique





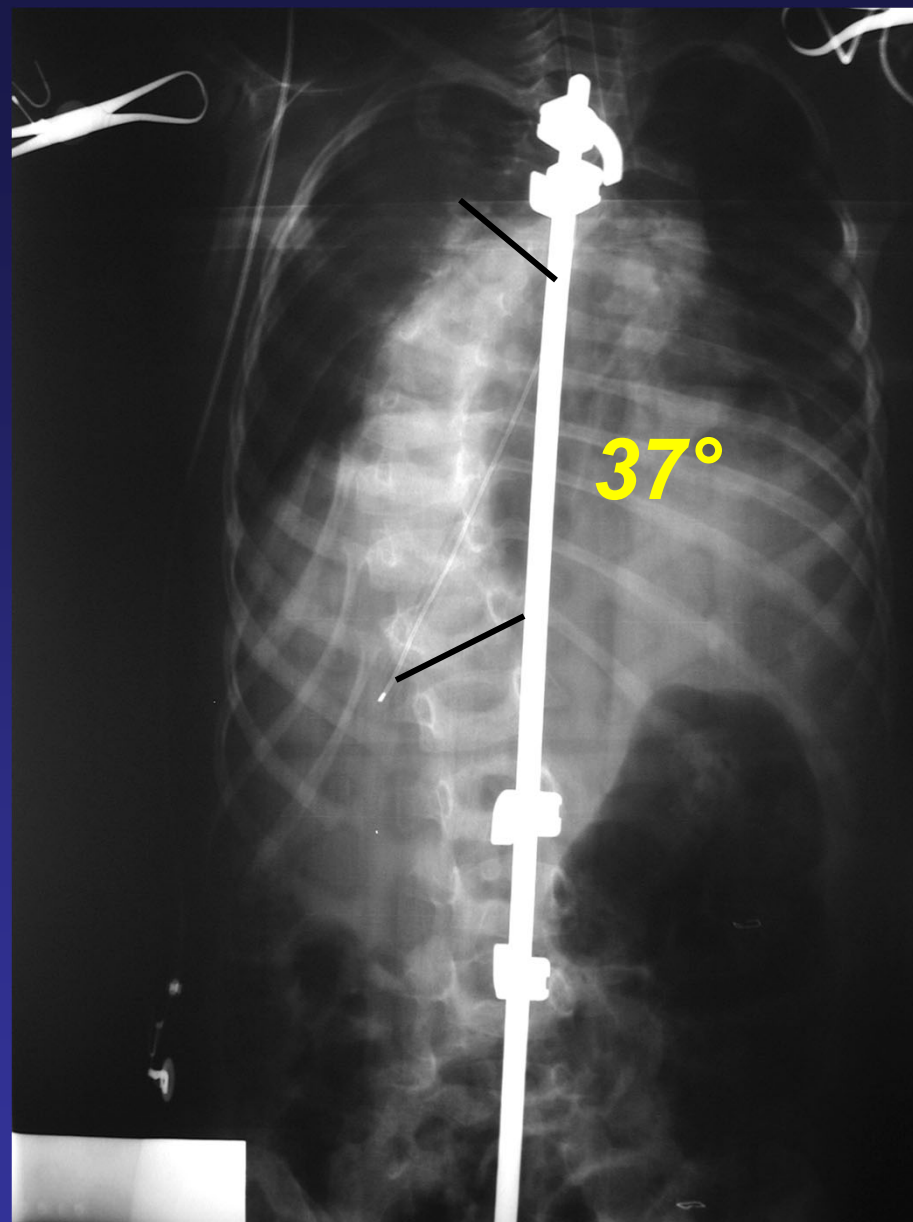
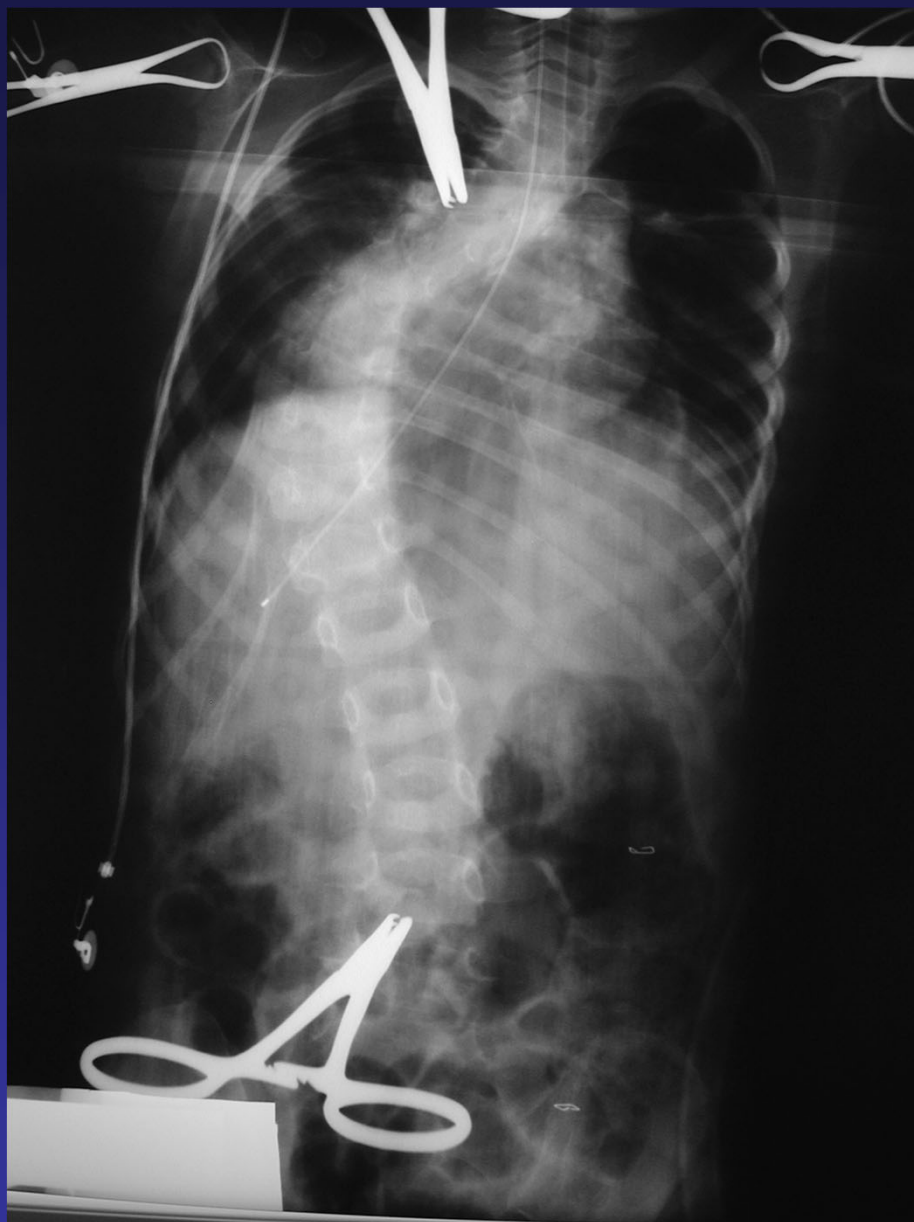
MC 3+6 3-01 Infantile Idiopathic Scoliosis





MC Preoperative radiographs 2-01





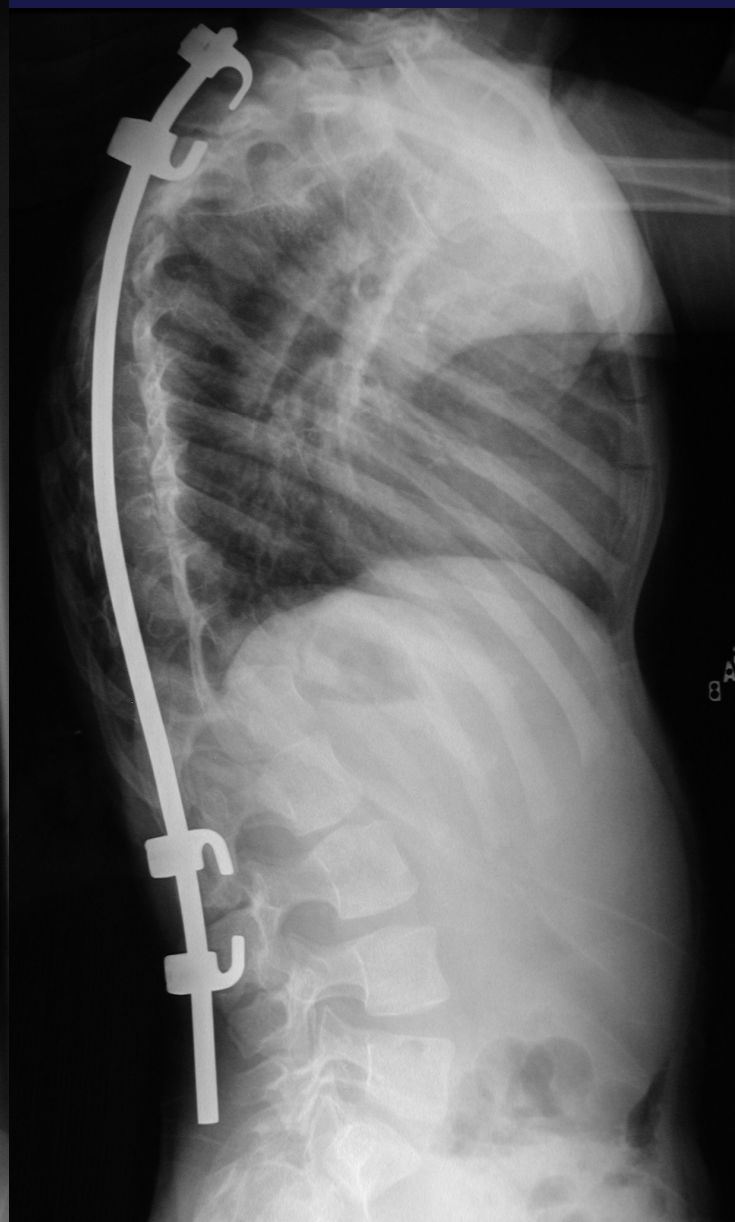
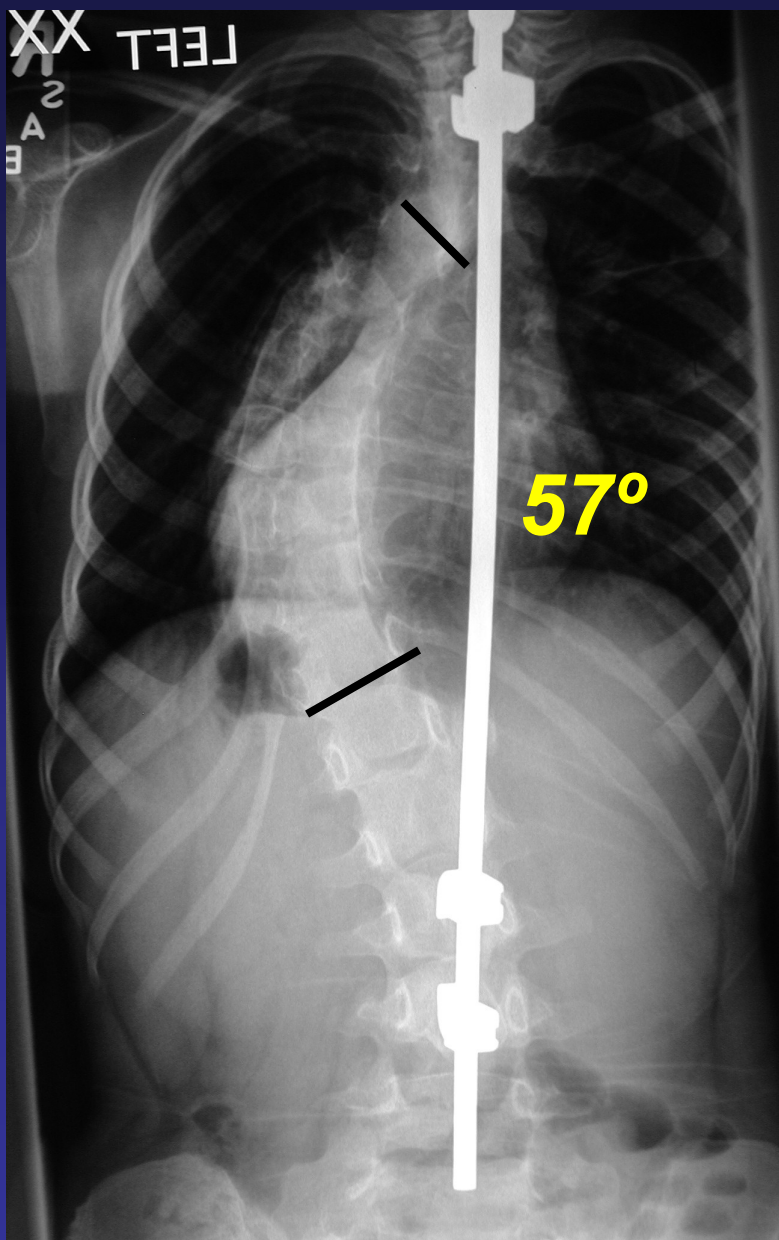
Intraoperative radiographs





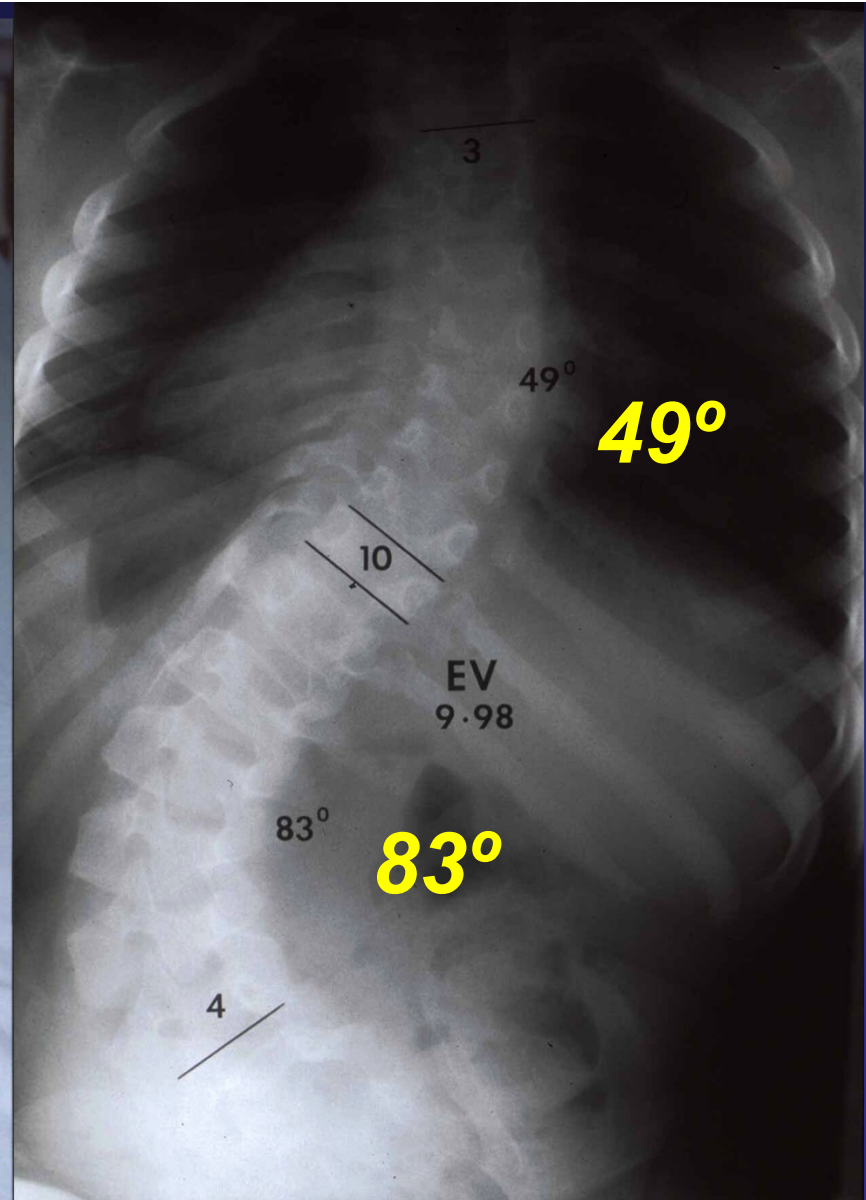
MC 3+8 2 mos s/p submuscular rod





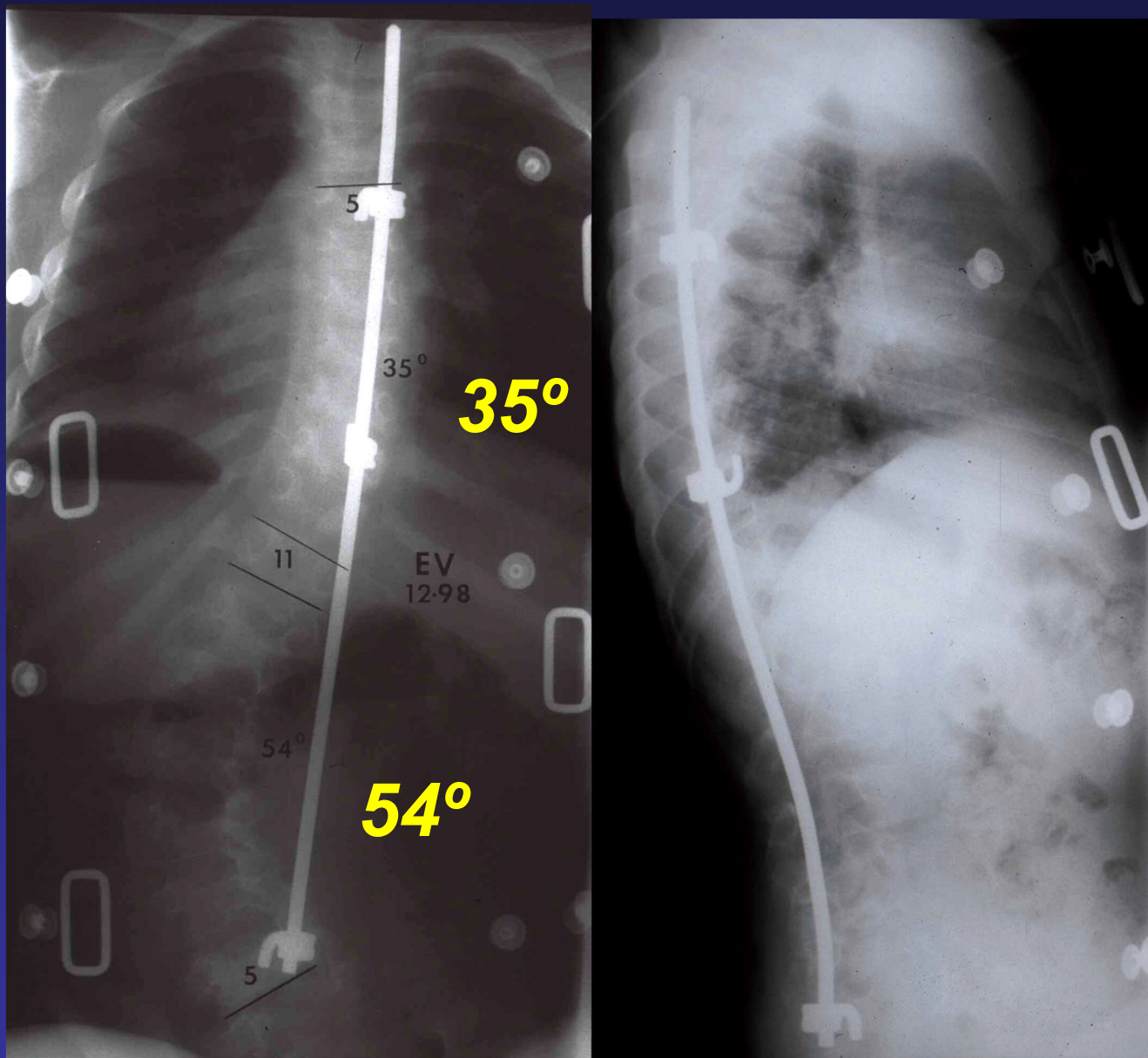
MC 6+9 yrs 2 yrs postop 10-03





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

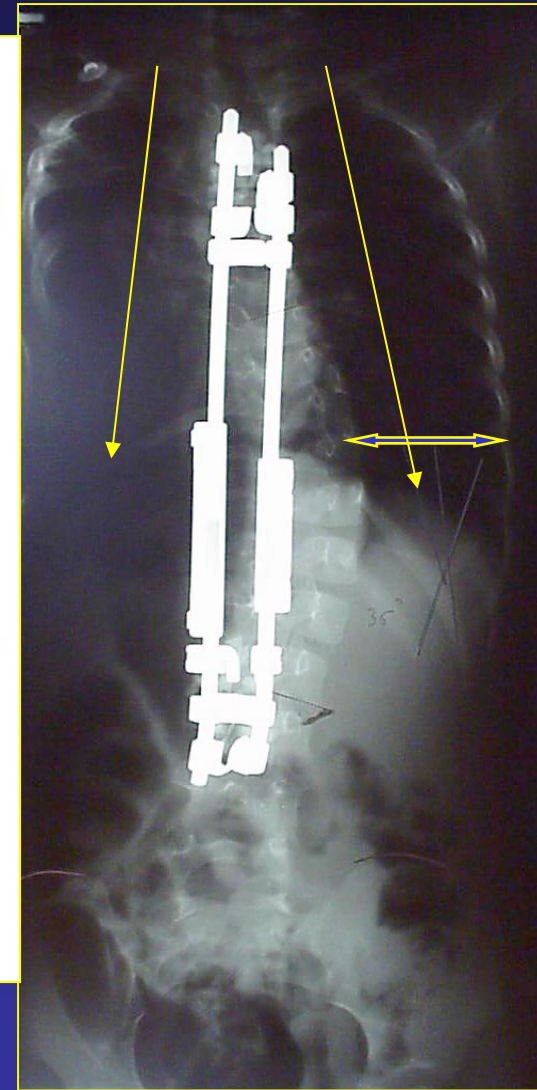
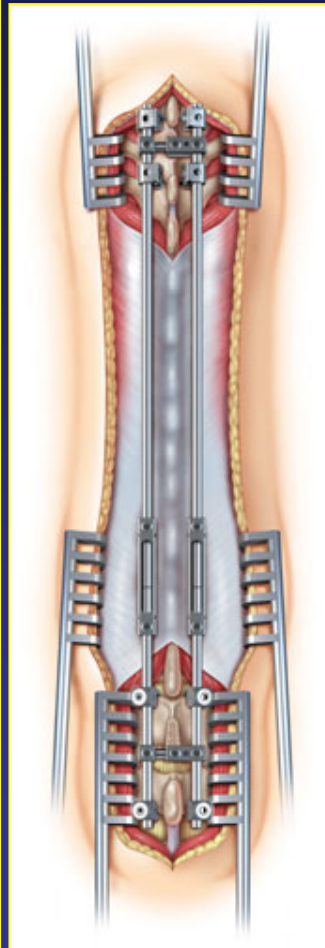
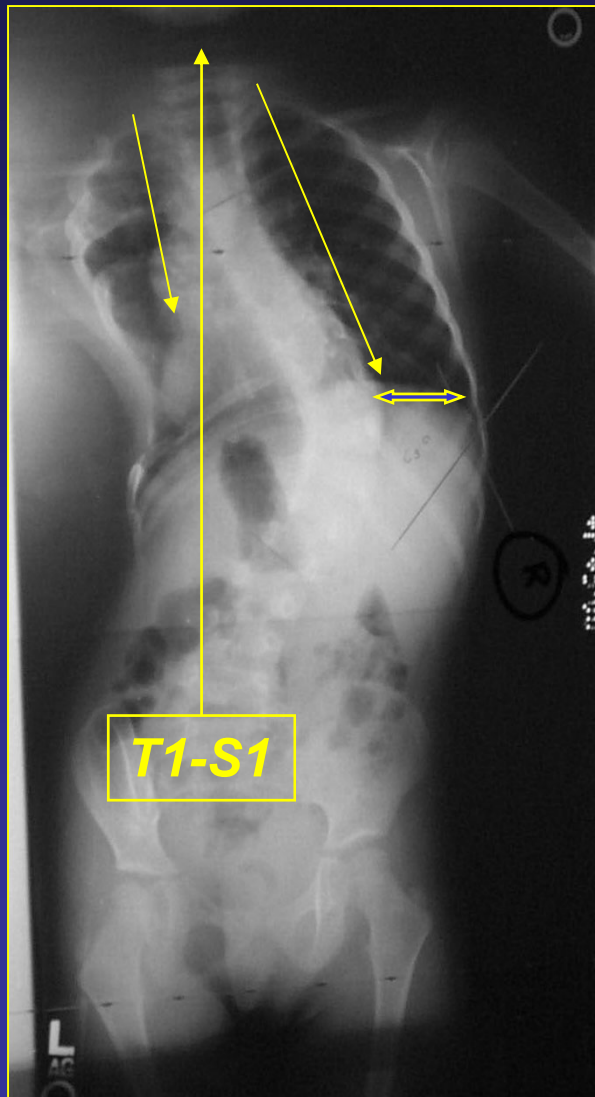


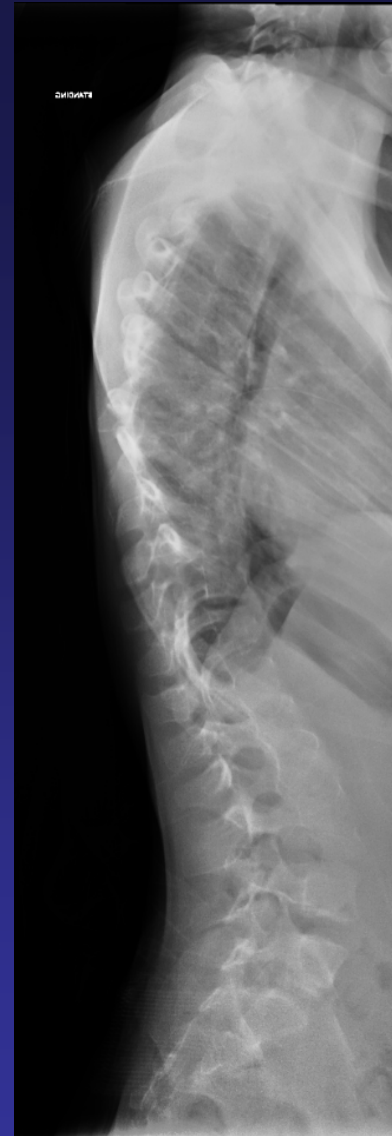
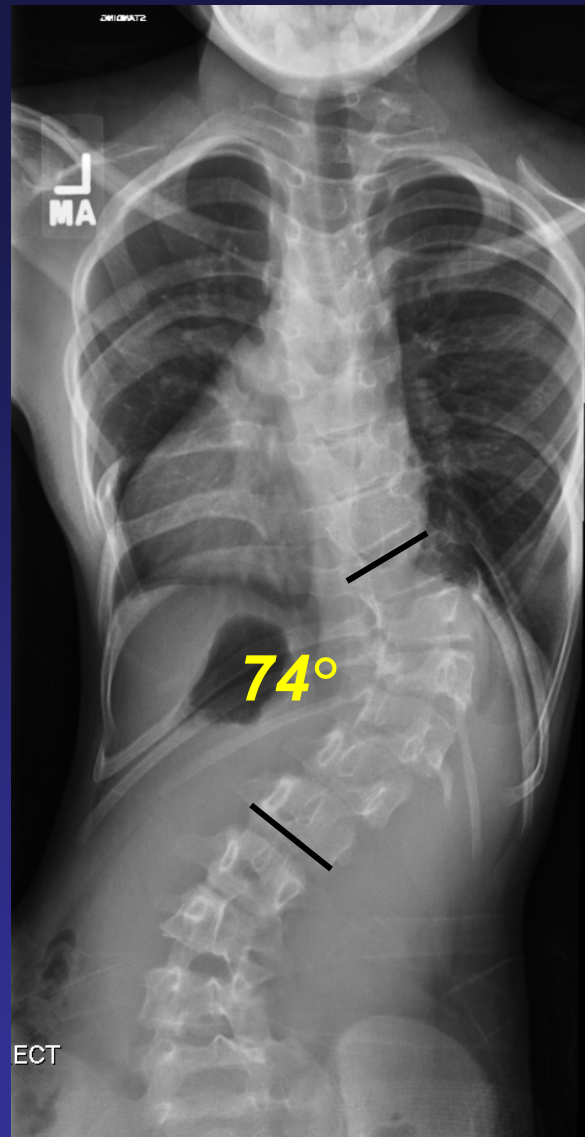


3 mos postoperative 12 - 98



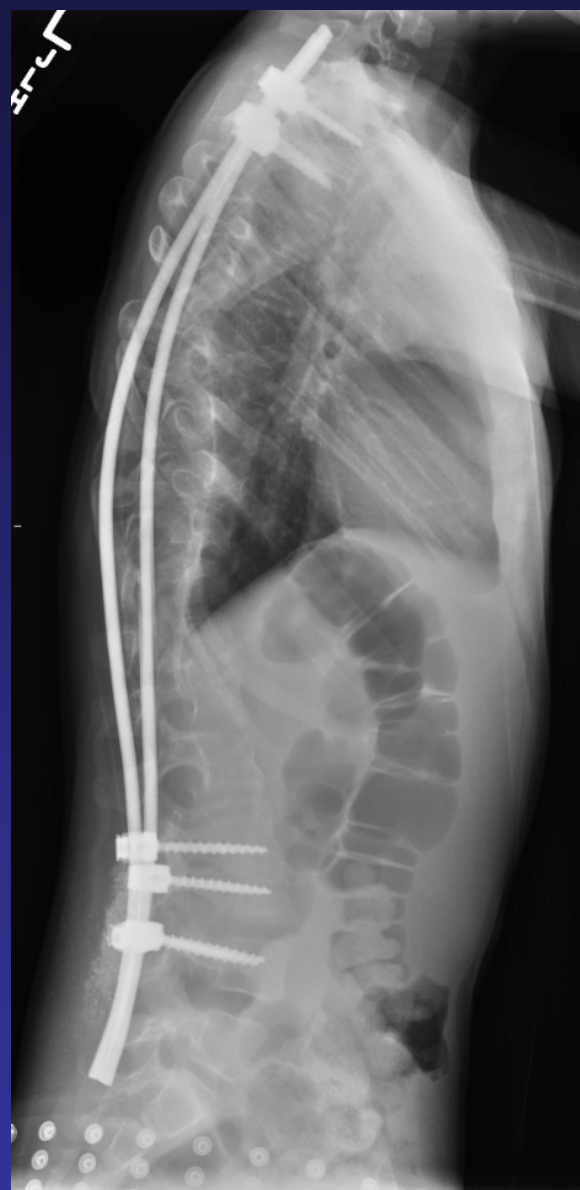
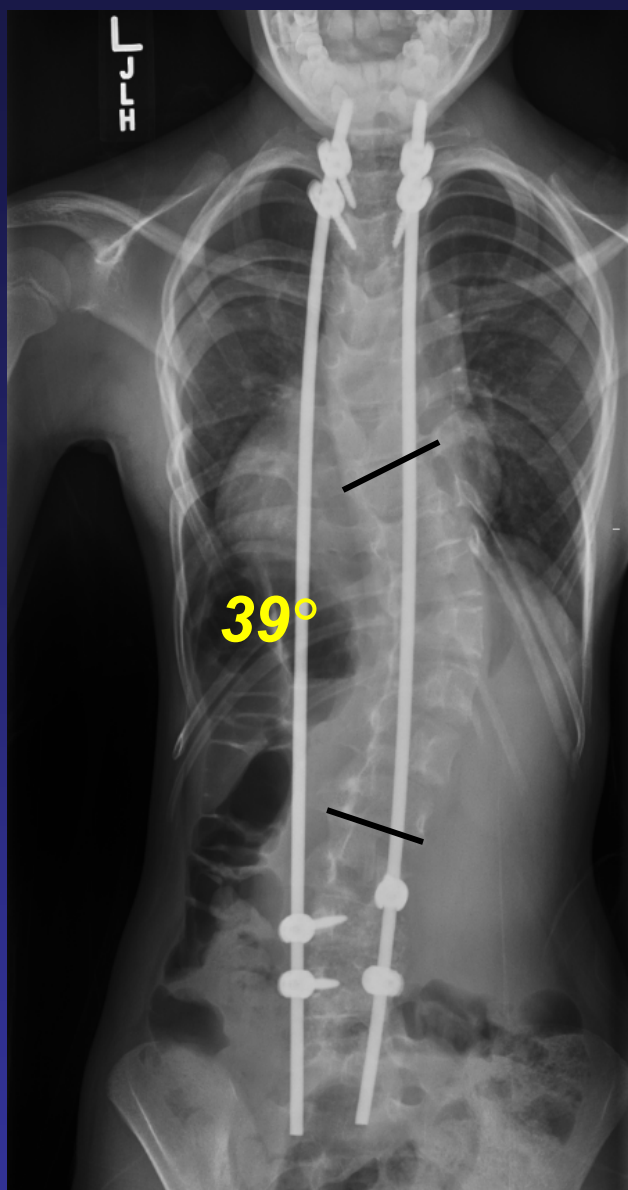
Dual Rod Technique





MMcC 8+11 female 8-09
Spondylothoracic dysplasia

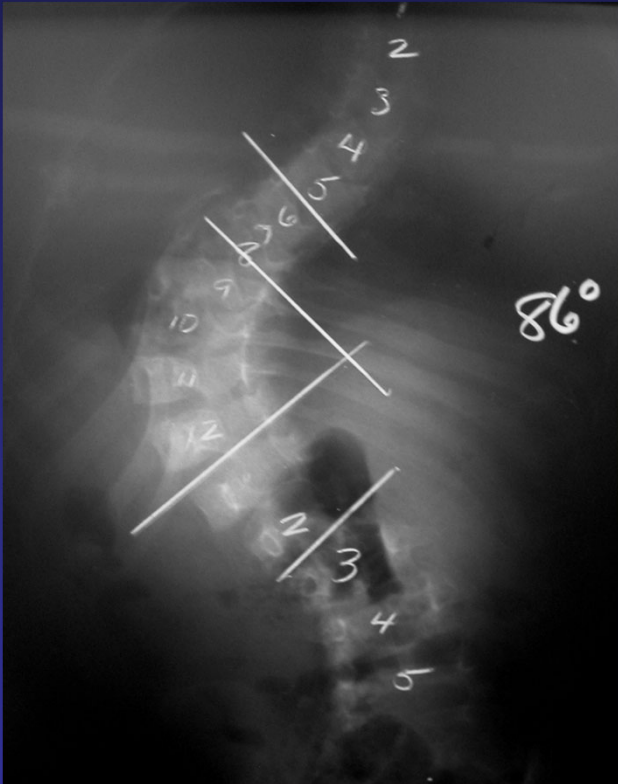




MMcC 9+1 years 10-09

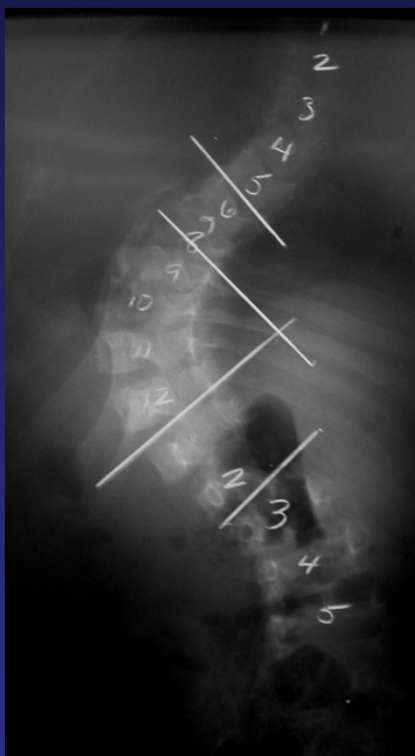


Shilla Procedure

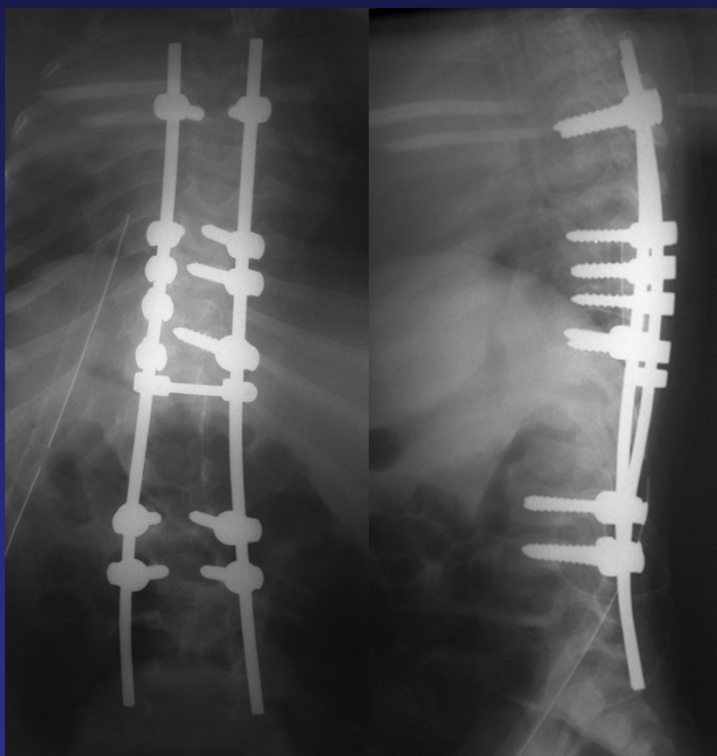


JH 2+10 yr female
Infantile Idiopathic Scoliosis

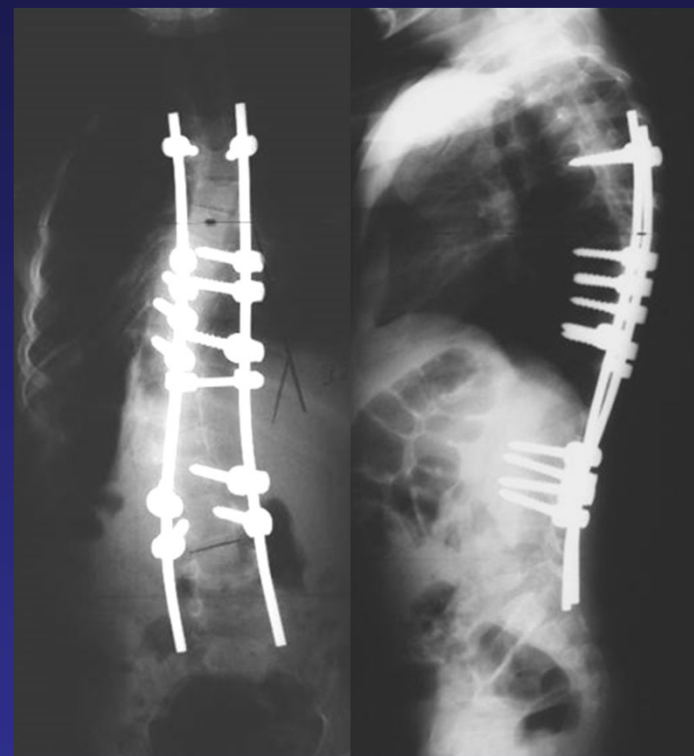




Preop



Postop



2 yr postop



Preop



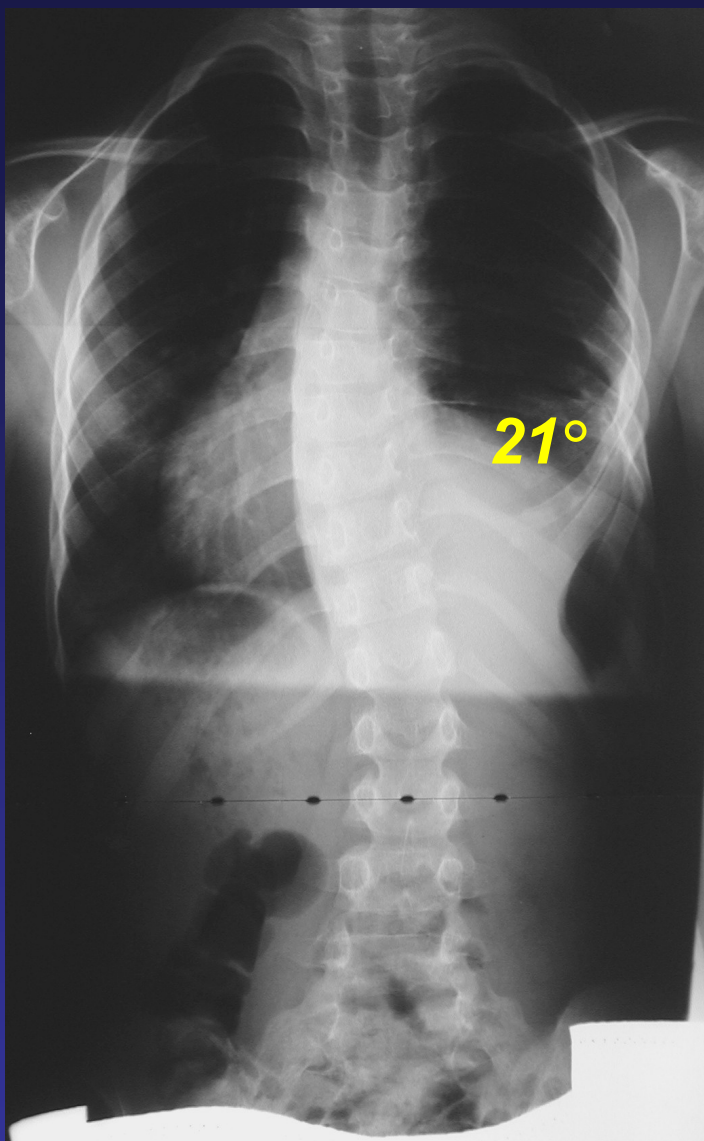
2 Yr Postop



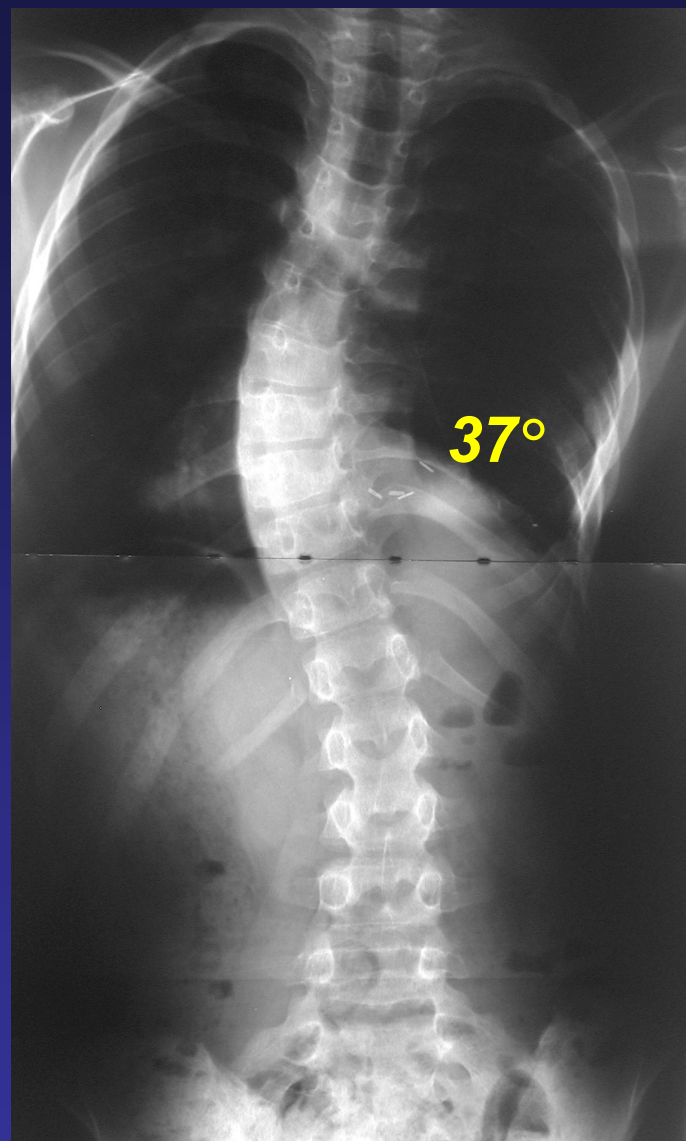


VEPTR
Vertically Expandable Prosthetic
Titanium Rib



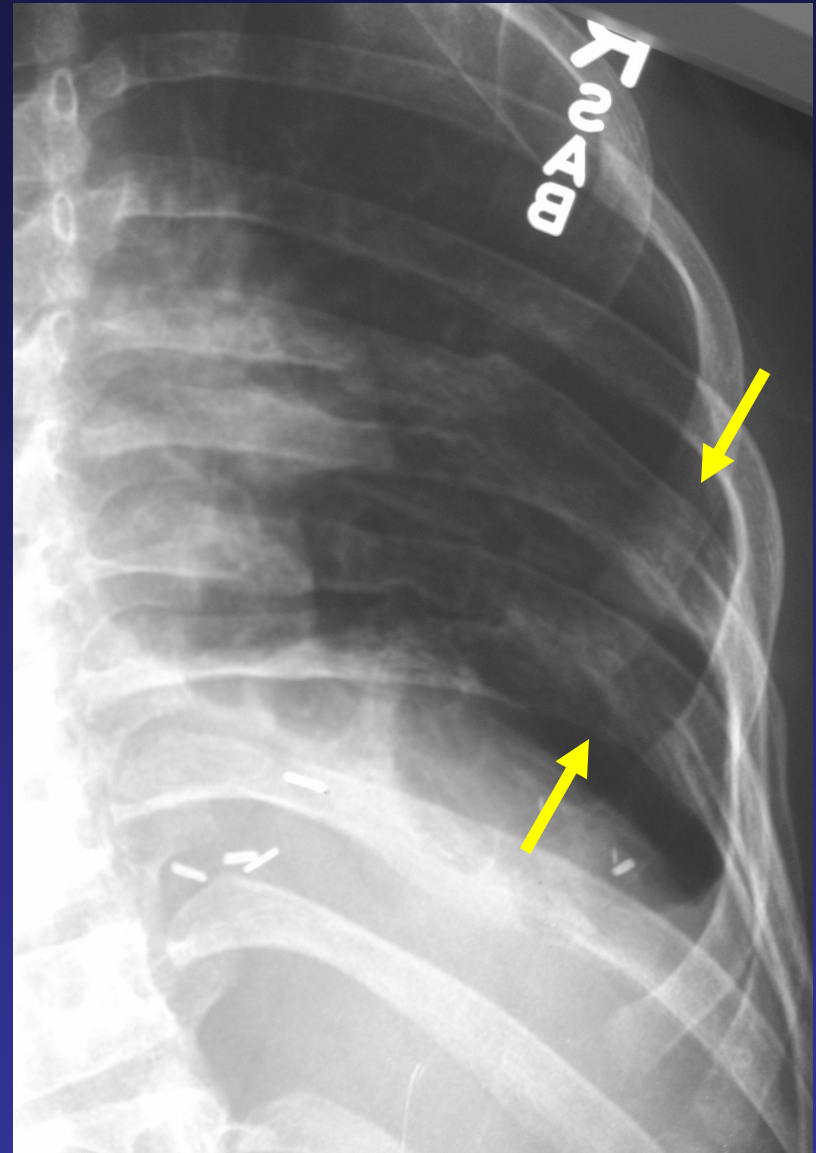
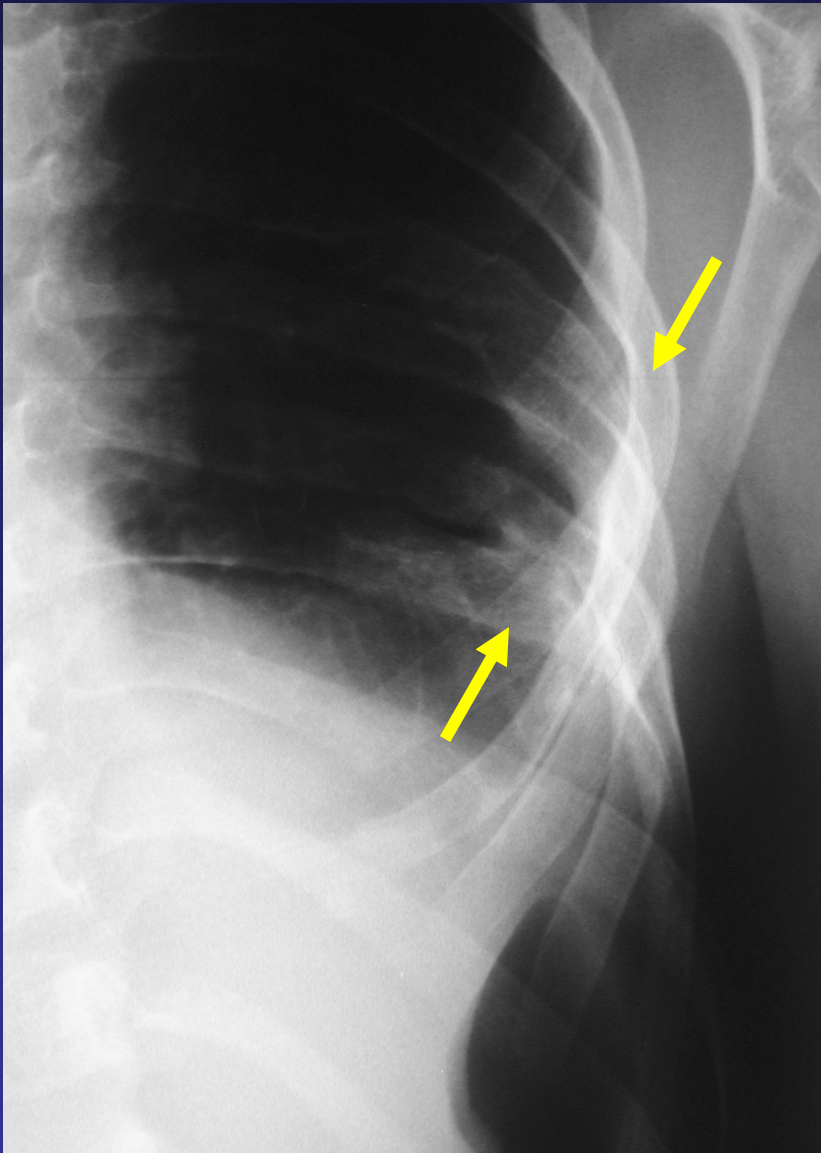


7+0 yrs
3-03



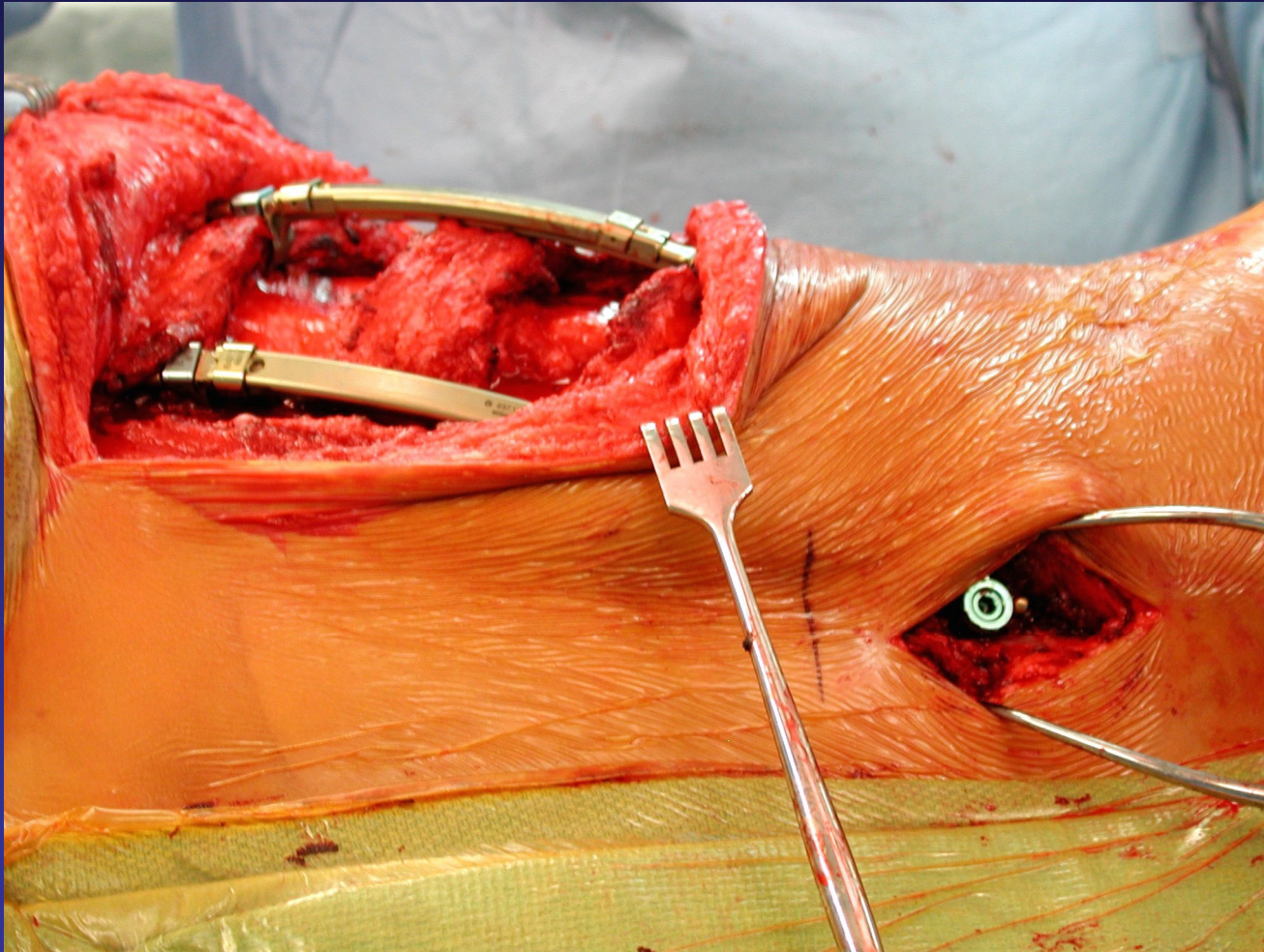
10+4 yrs
7-06

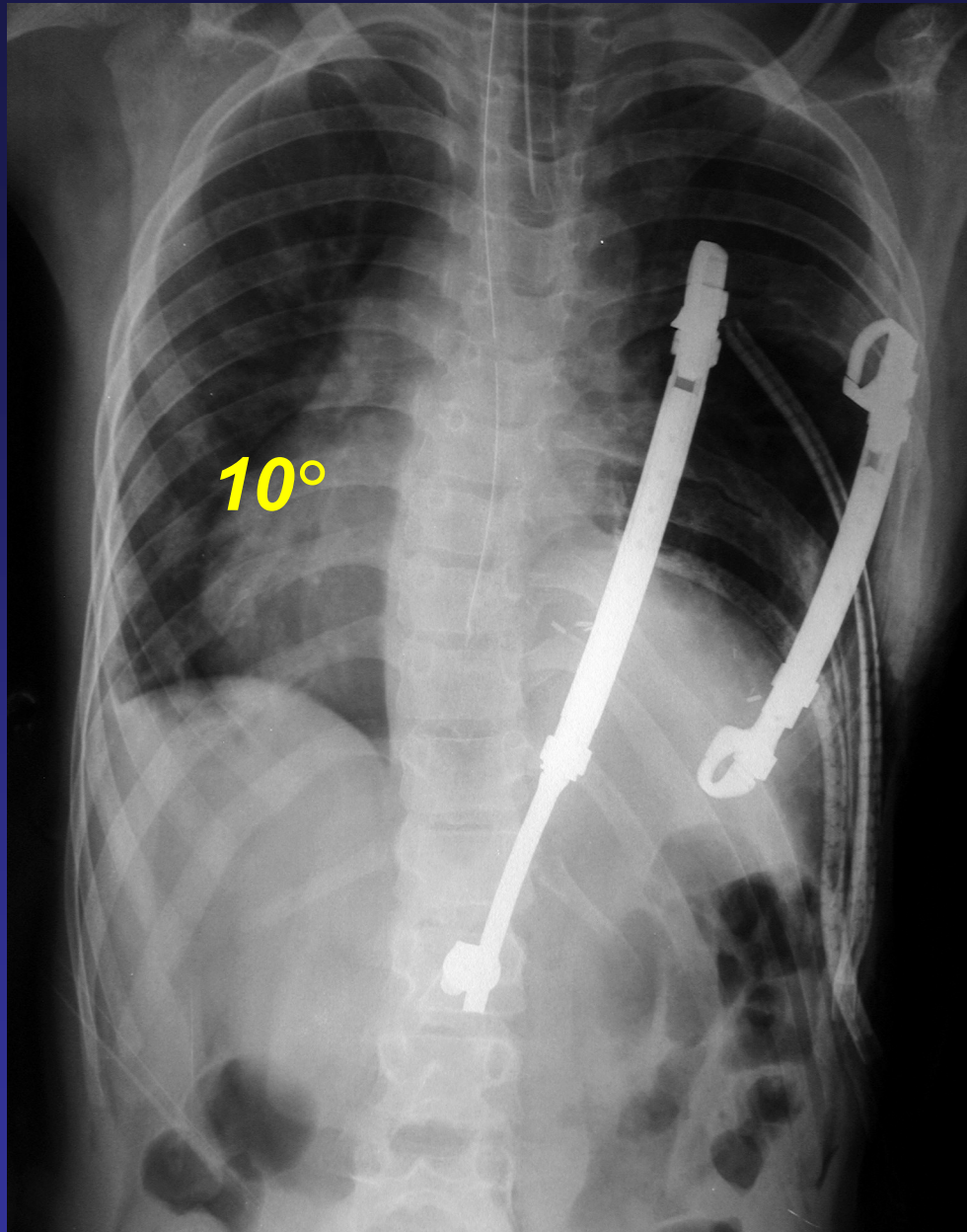




Two pair of fused ribs







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

