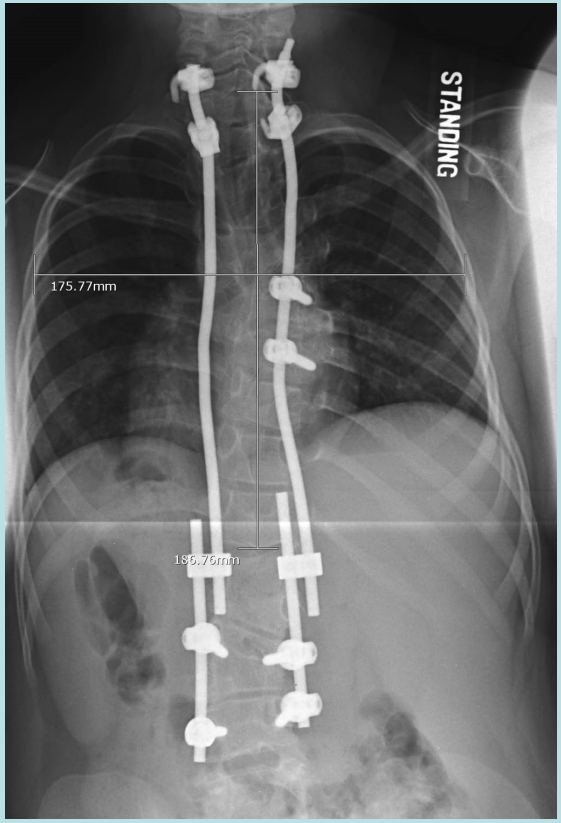
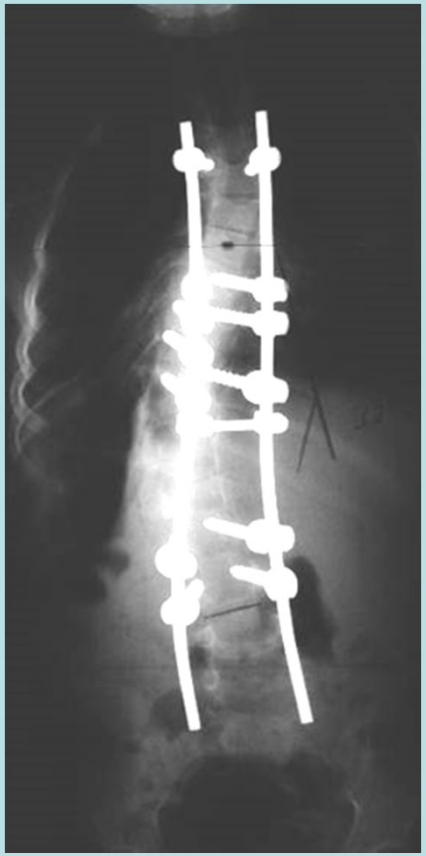
EOS Dogma

Is Apical Correction/Fusion Necessary?

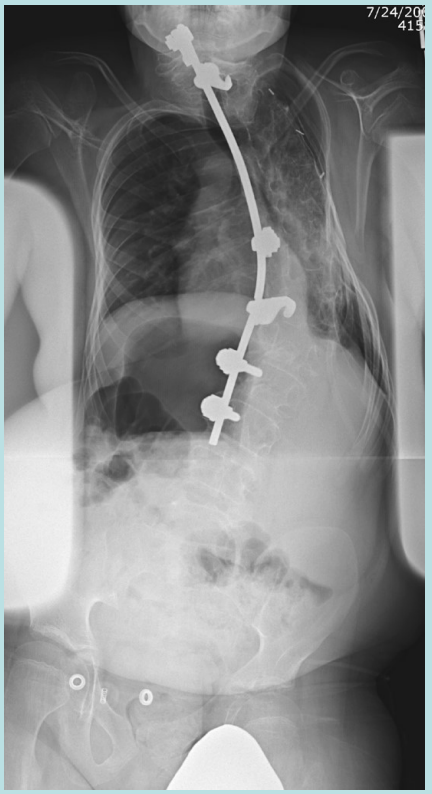


Charles E Johnston MD
Richard E McCarthy MD



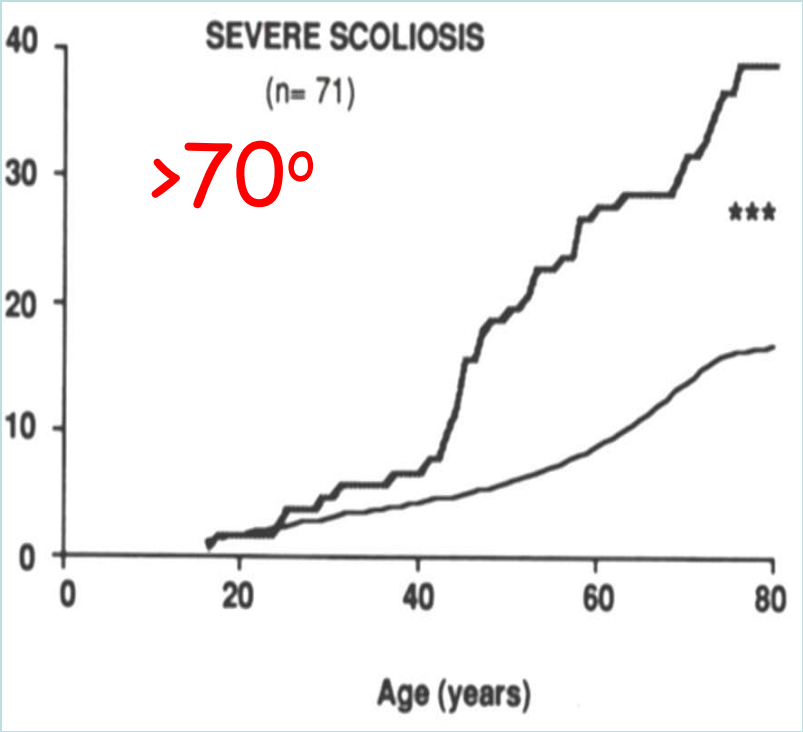
What Causes T.I.S. ?
→ Respiratory morbidity

- Early onset – intrinsic lack of alveoli
- Deformity – extrinsic chest wall dysfunction



EOS RX – Prevention of T.I.S.

- Intrinsic – <u>early</u> thoracic enlargement
- Extrinsic – control/correct deformity w/o growth inhibition



- Pehrsson
- Branthwaite
- Bergofsky

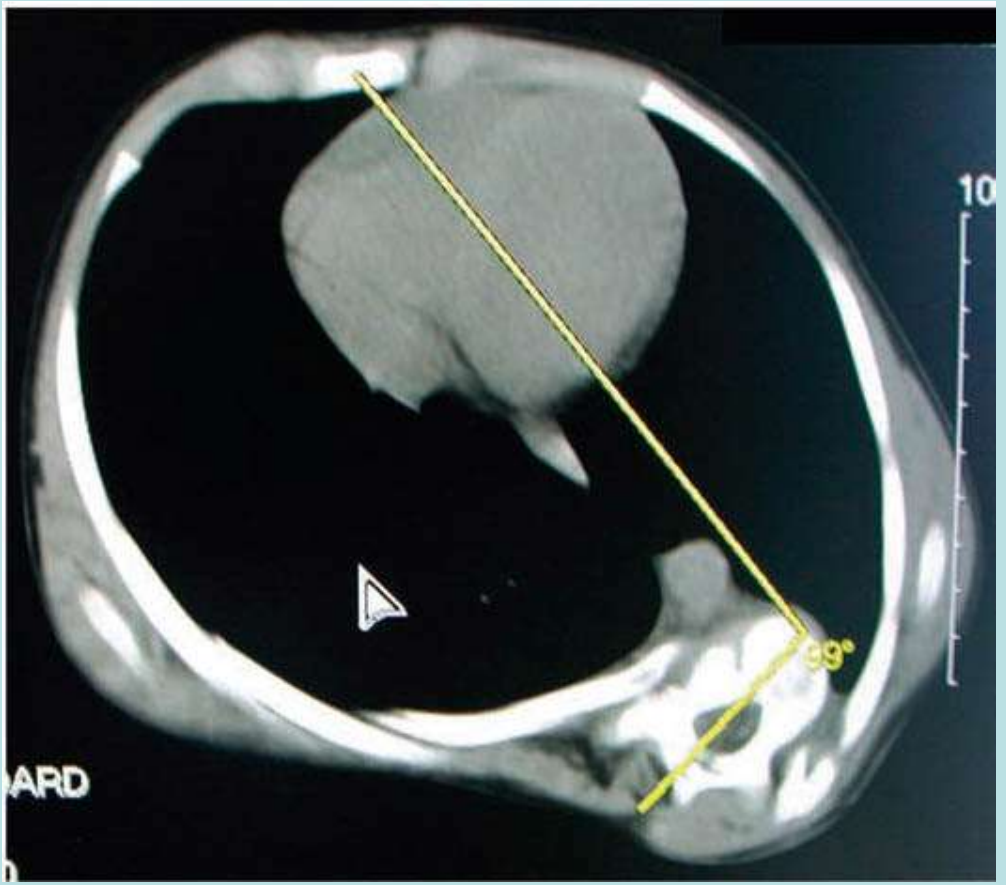
Nat'l Hx Ominous for PFT's <45% pred

What's Wrong with Distraction ?

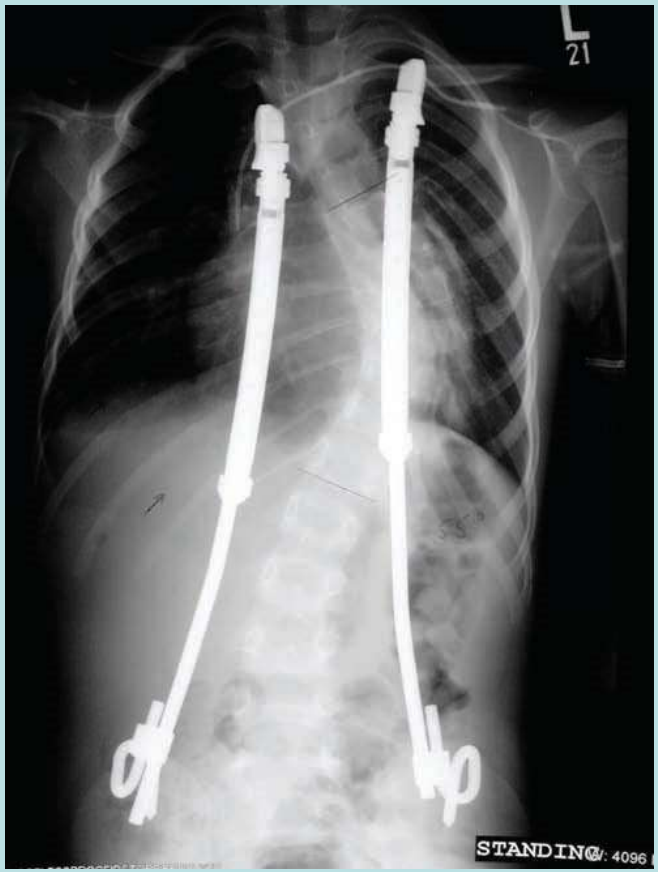
- Nothing – in some cases

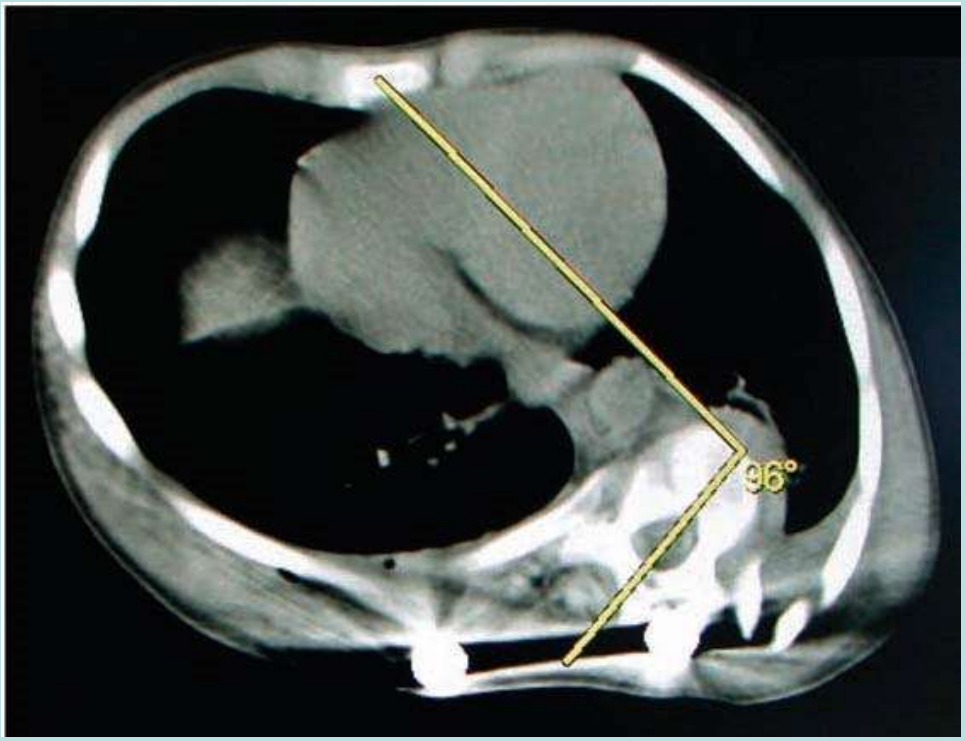
  But consider……..
- Distraction directs corrective force at ends of curve, apex corrected only indirectly if at all
- Apex = most deformity, site of convex spine penetration, produces windswept constriction deformity

Veptr and windswept correction
(Campbell/Smith JBJS '07 supp)



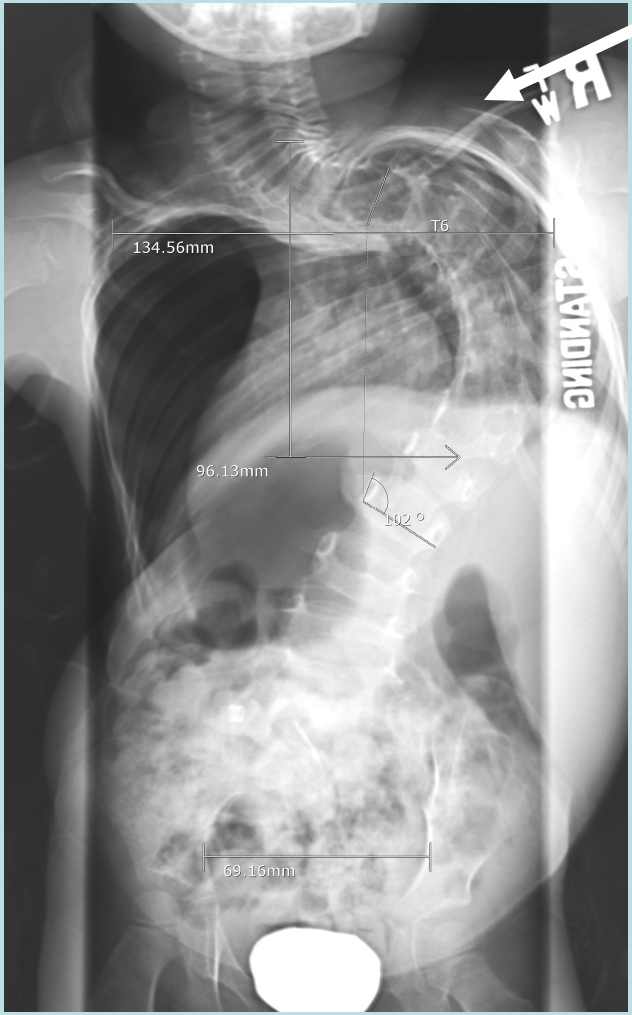
Postop – no improvement
Distraction inefficient to correct axial plane (windswept) deformity
Extrinsic deformity remains



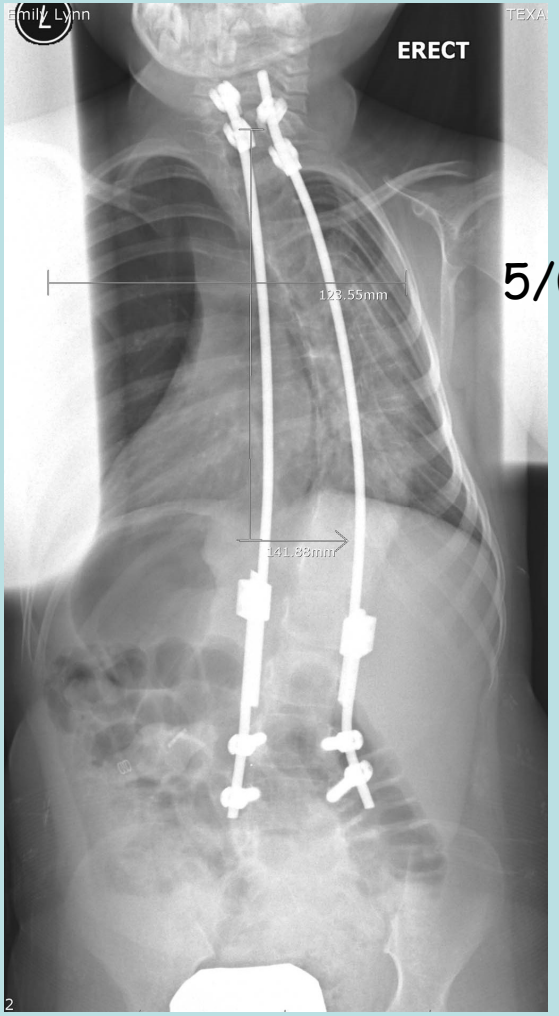


"Traditional" double growing rod

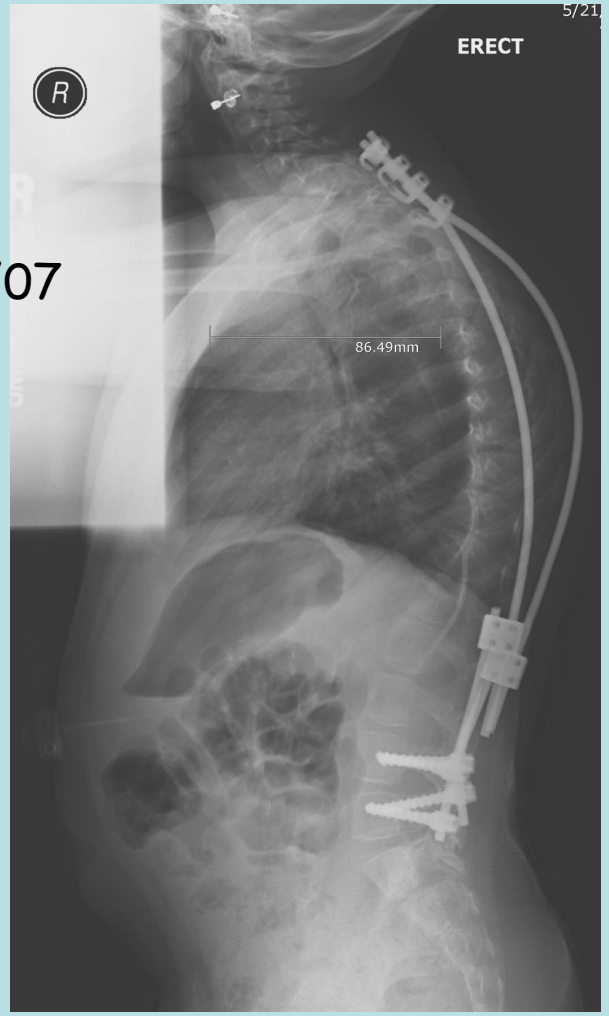
4 yo 102°



T1-12 9.6, T6 wd 13.5

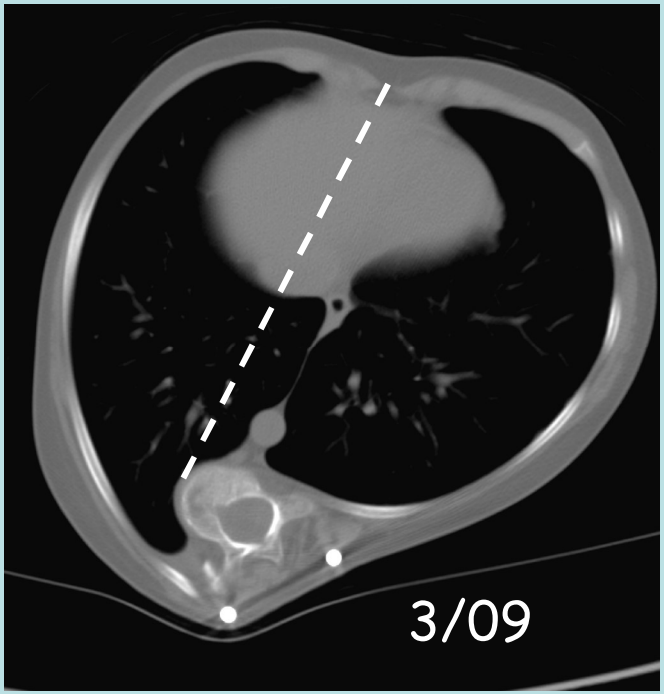


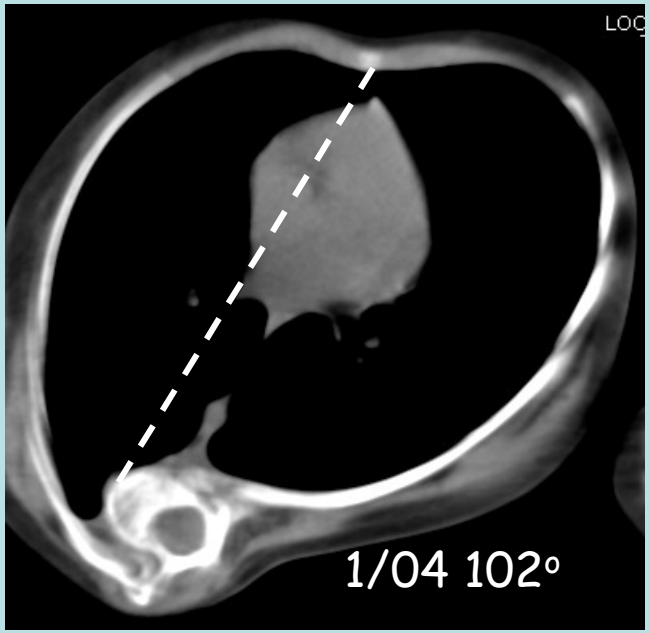
5/07

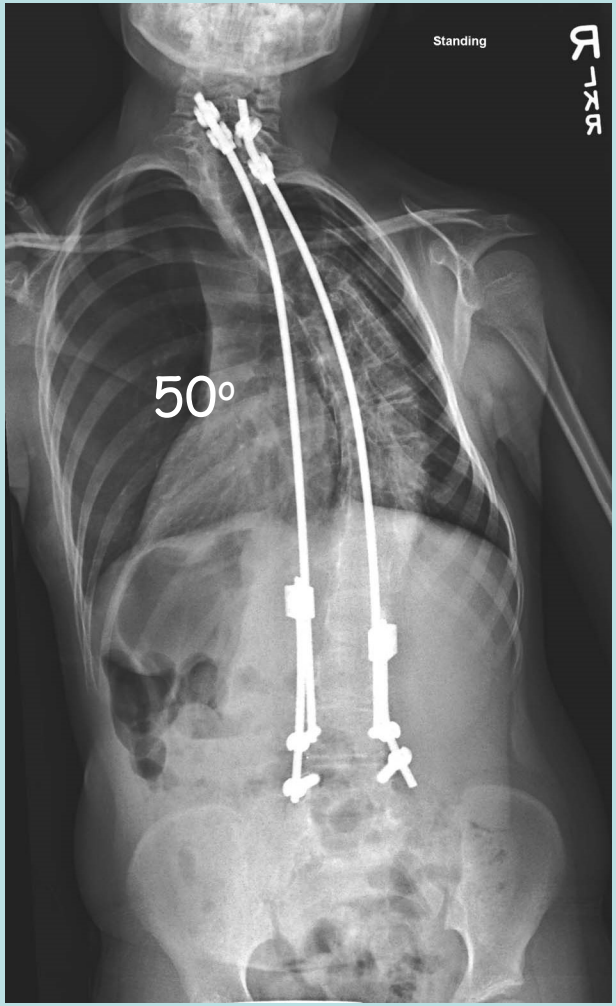


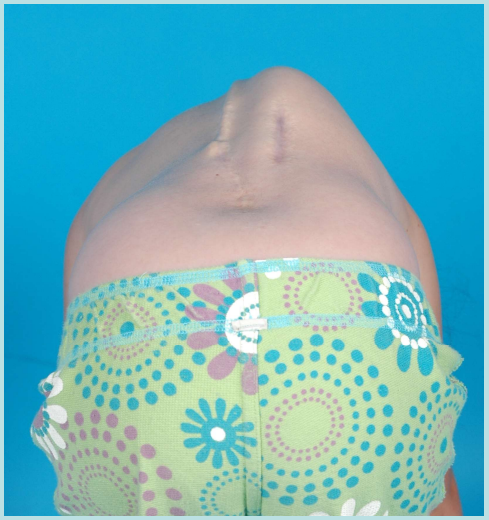
14.1 , 12.2

F/u 3/09

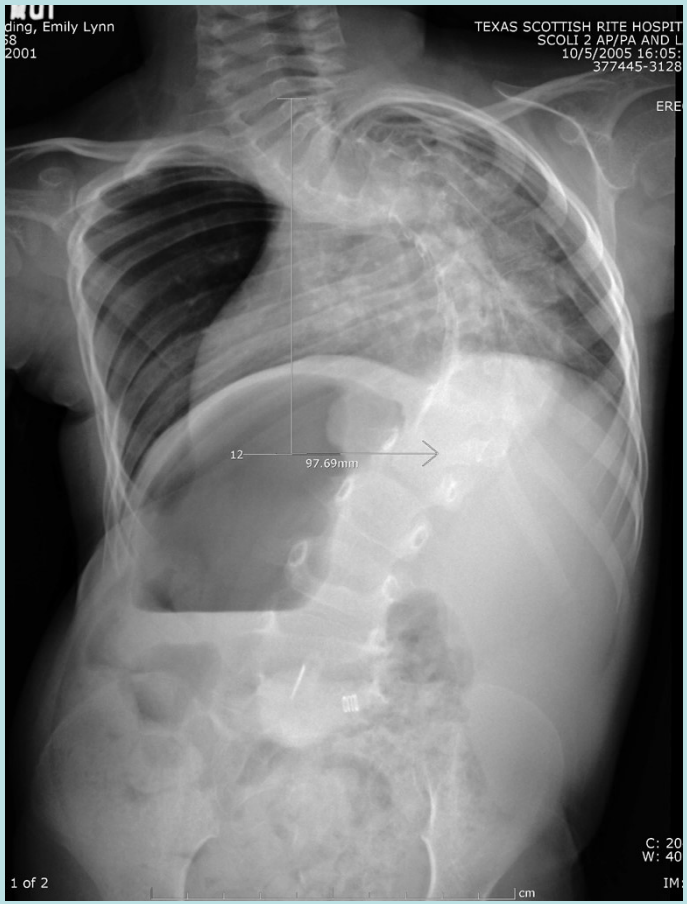


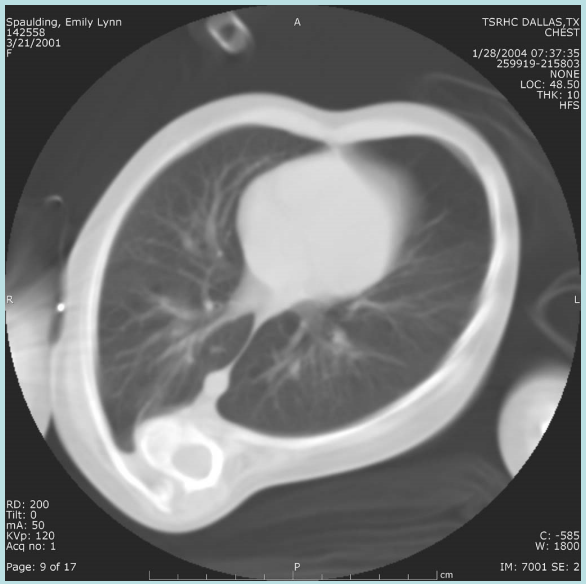


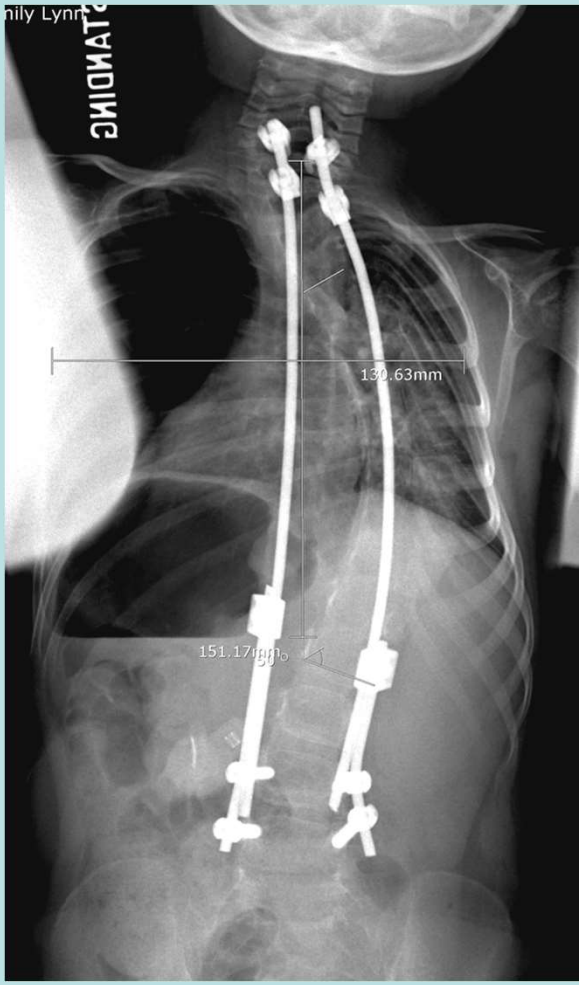


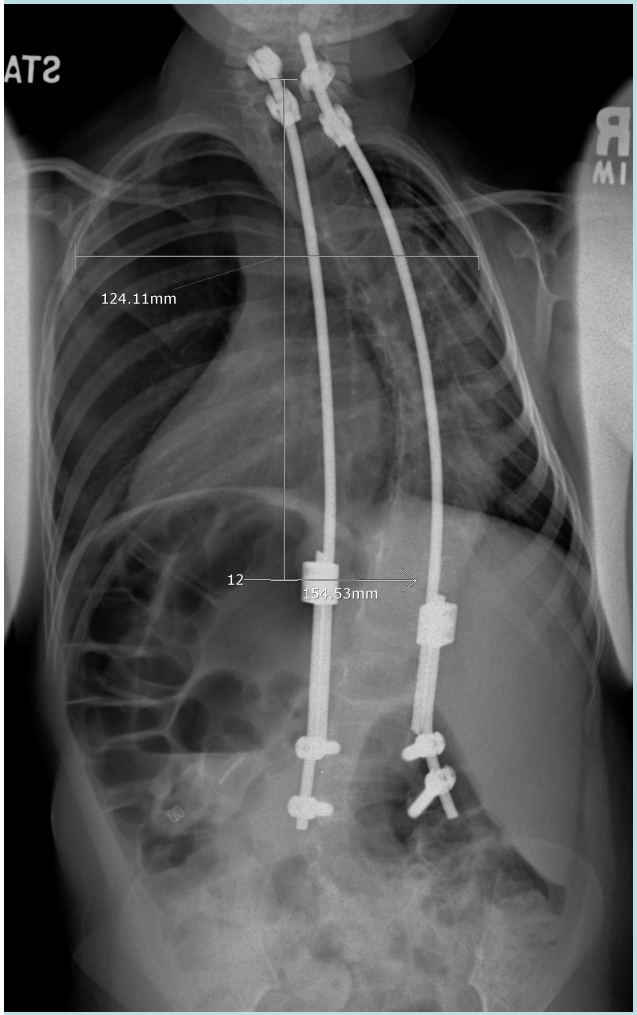


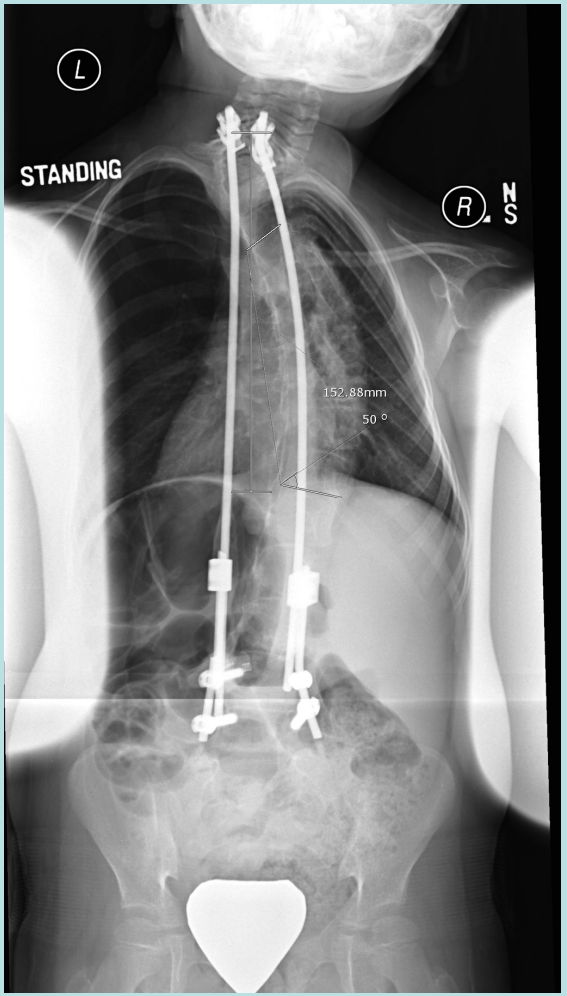
Dual rod distraction rods all on concavity





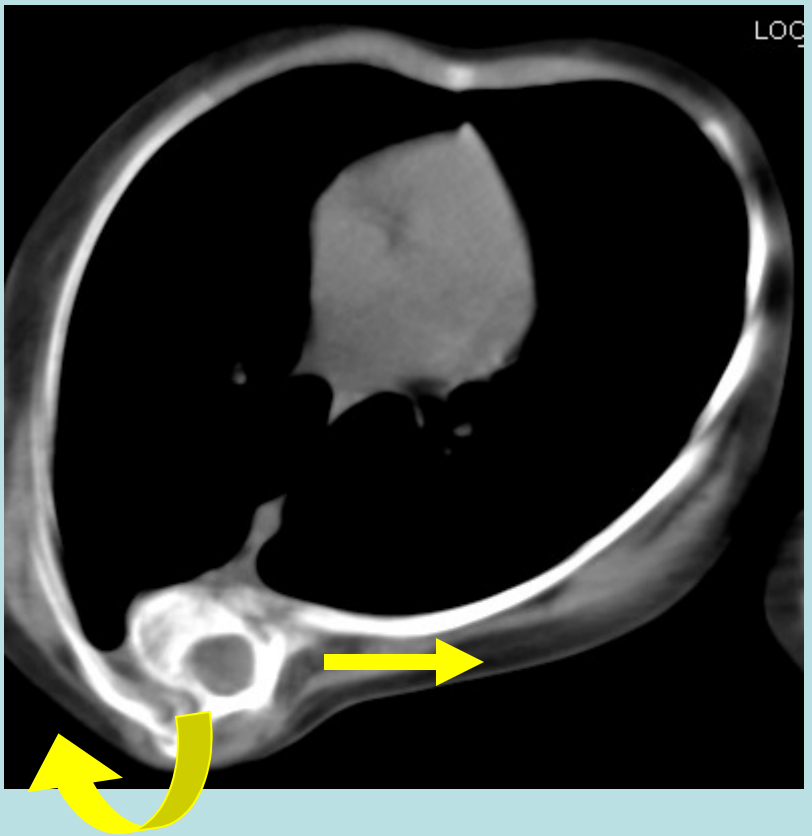



124.11mm
12
154.53mm


L
STANDING
R
152.88mm
50 °

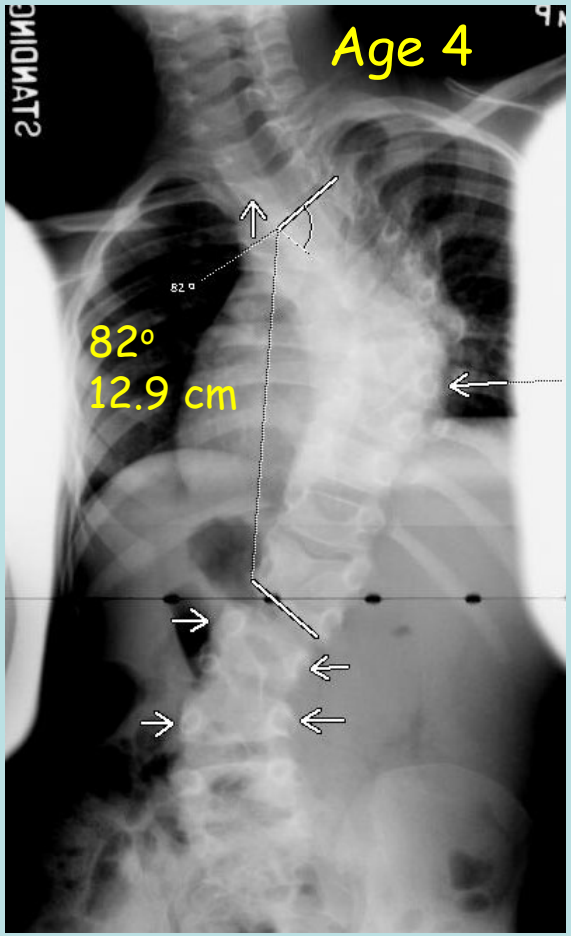
GR's + apical fusion -> poor outcomes (Thompson,Akbarnia)

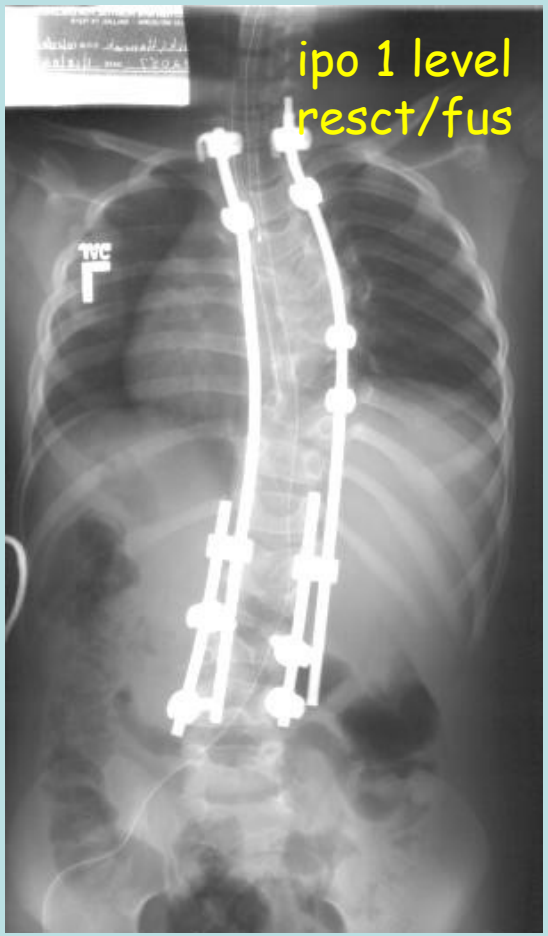
1. Lack of apical control by implants
2. No serial corrective maneuvers
3. "in situ" fusion of most deformed part -> ? ineffective to control deformity (= crankshaft)

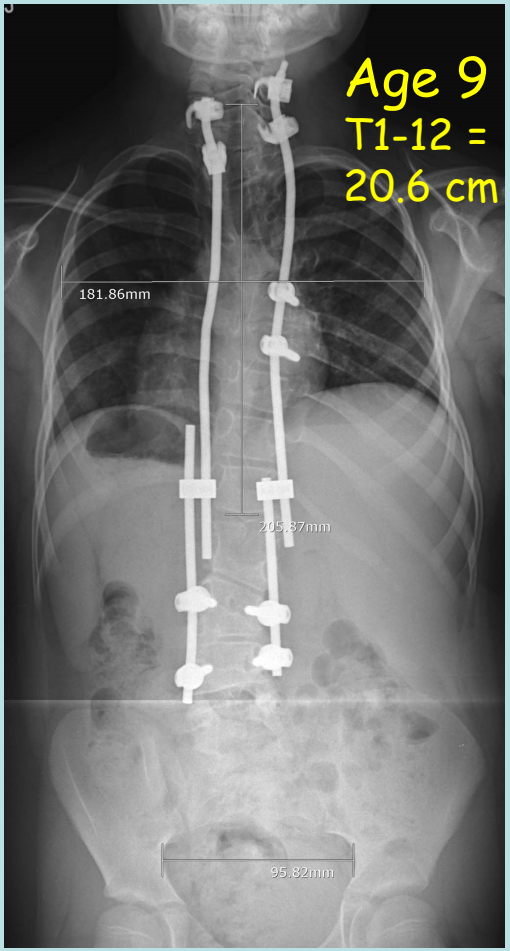


APICAL CONTROL

4. Early rx must correct or prevent progressive spinal deformity producing windswept thorax

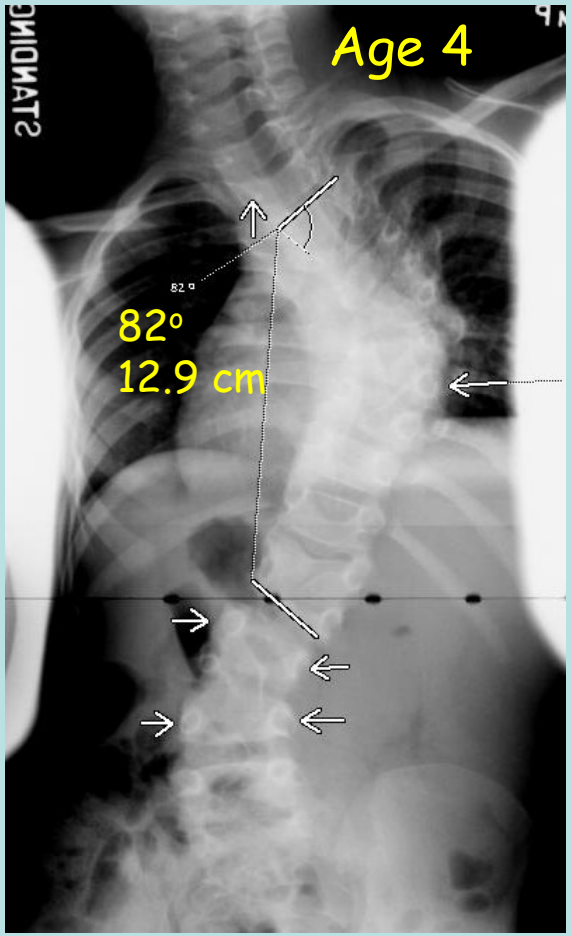


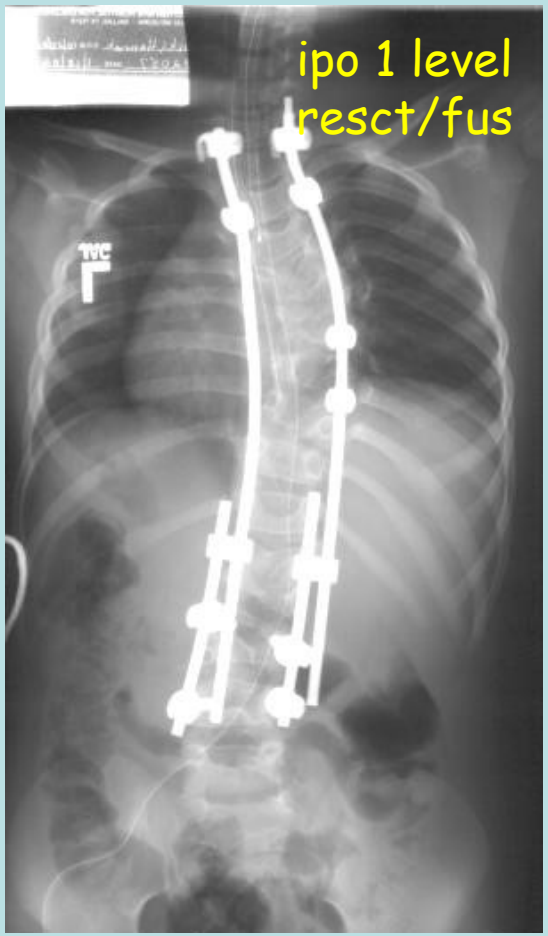


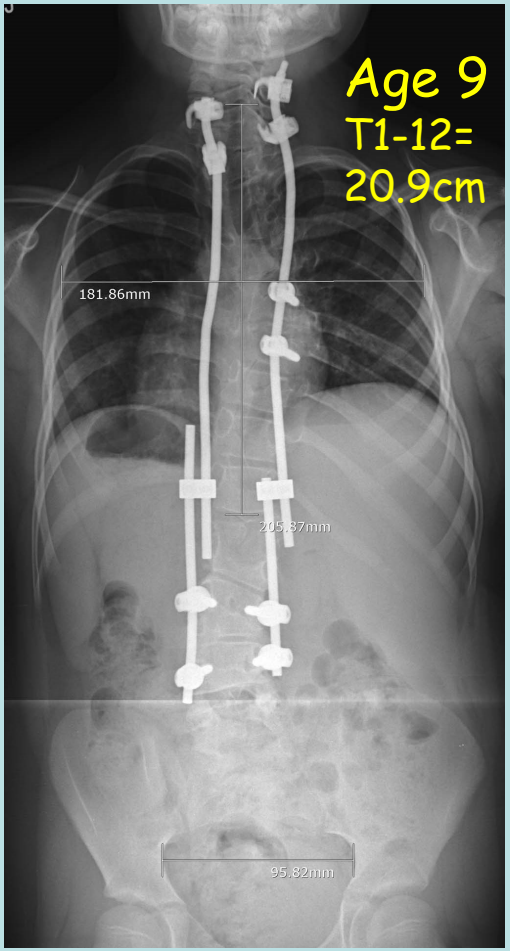


Posterior hemivertebra resection w/ 1-level convex-only fusion/fixation

Serial rod bending to correct AVT

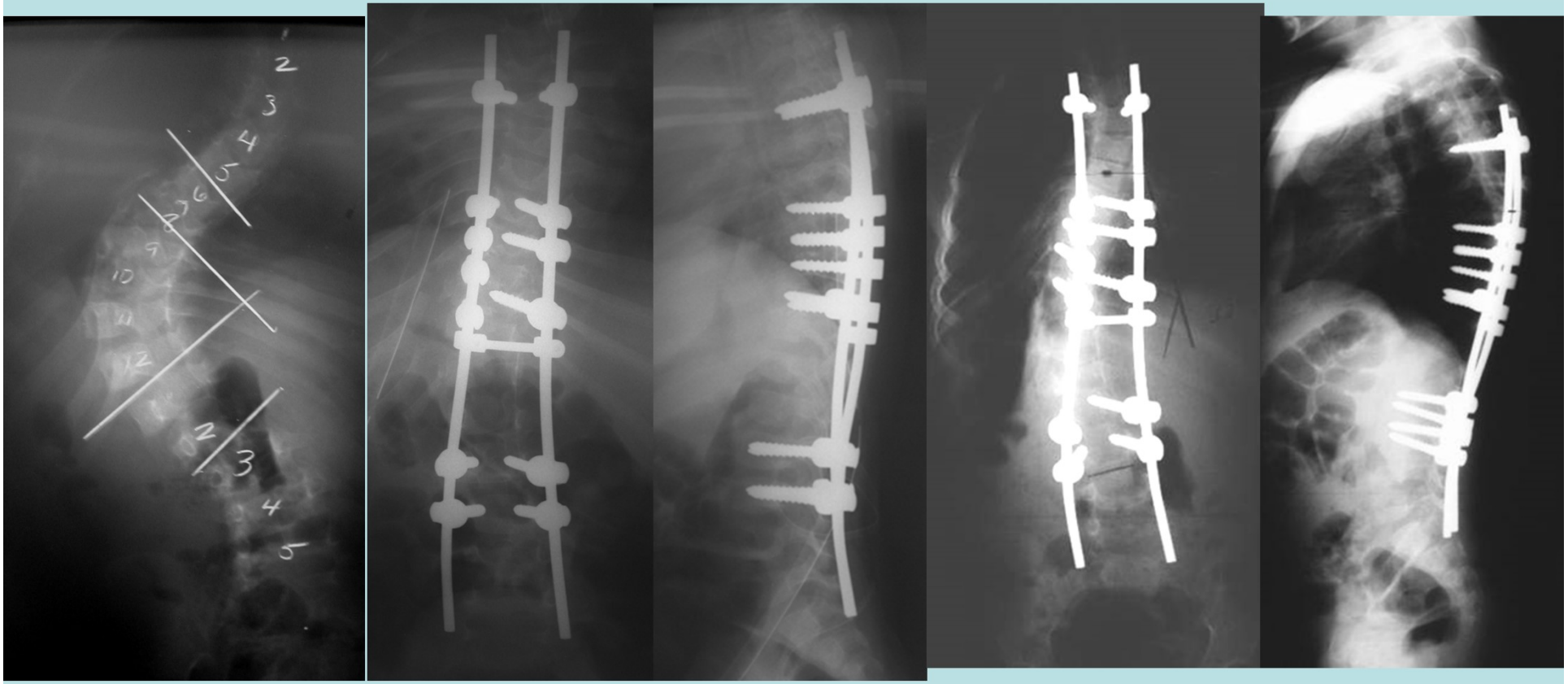






Hypercorrection of apex (incl ant release) + growth guidance at EV's

Courtesy RE McCarthy



Preop **Postop** **2 yr postop**

EOS Dogma – Apical Control

Zambezi River Apical Control Study Group 2010

- Controls AVT/AVR
- Minimize spine penetration, windswept thorax (direct attack on extrinsic deformity)
- ? Better correction of non-congenital extrinsic chest wall deformity