Masters Techniques: S-Hooks to the pelvis; Why, When, and How?

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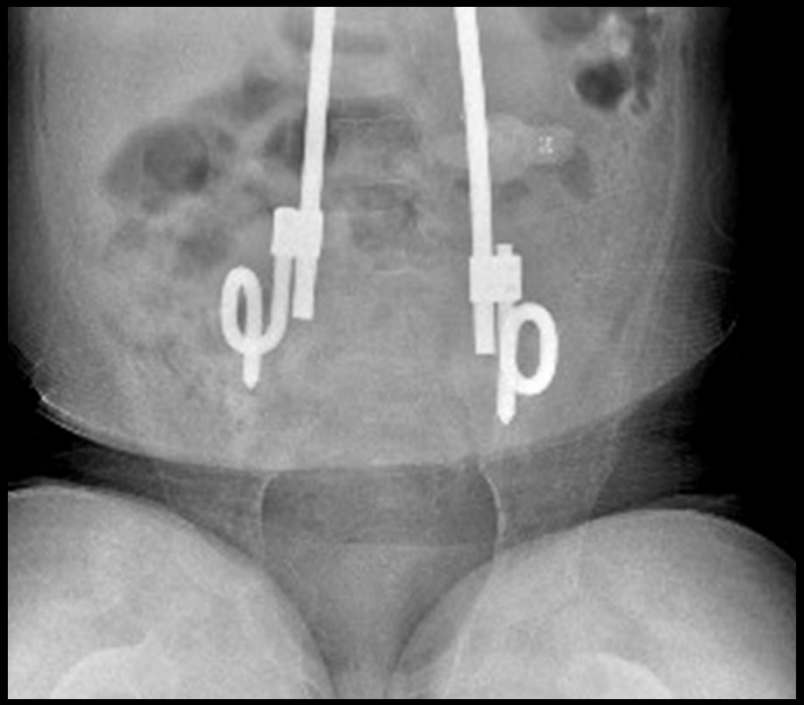
Disclosures

- Consultant: Depuy-Synthes Spine, Spineguard, Ellipse Technologies (wife)
- Royalties: VEPTR 2 Device
- Board Member: Children's Spine Foundation

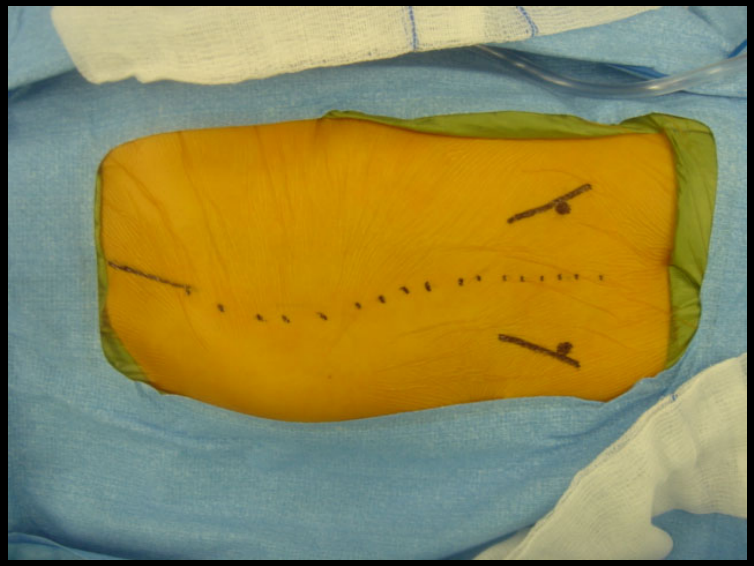
“S” Hooks to the pelvis

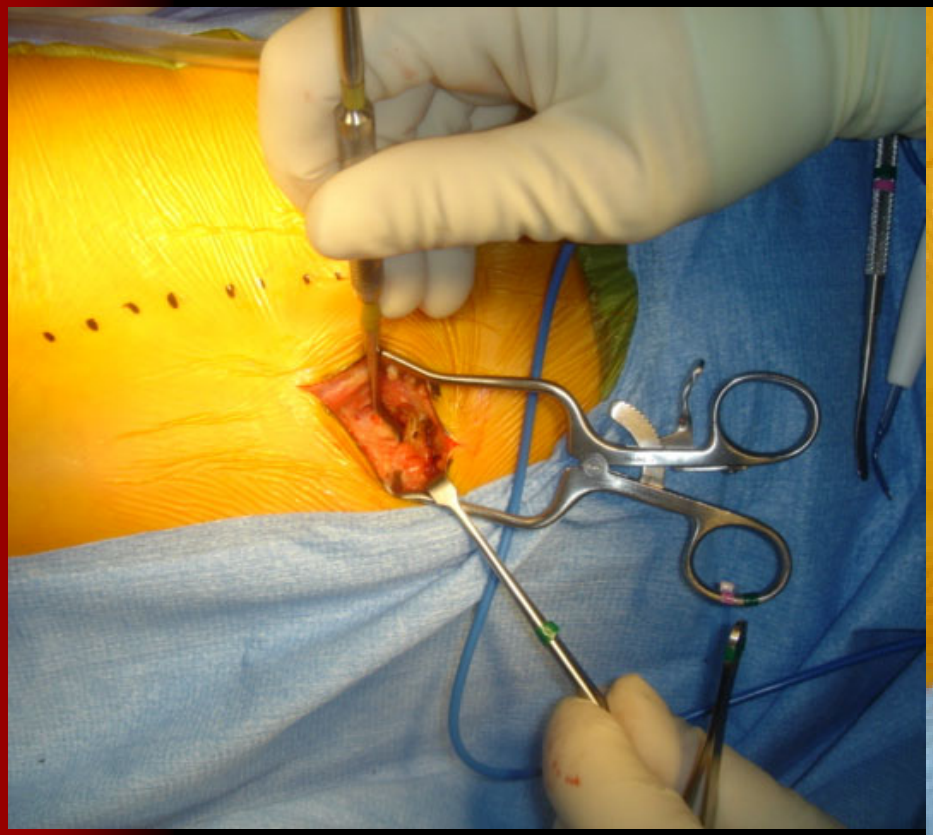
- Simple
- Fast
- Versatile
- Address pelvic obliquity
- Avoid the midline skin



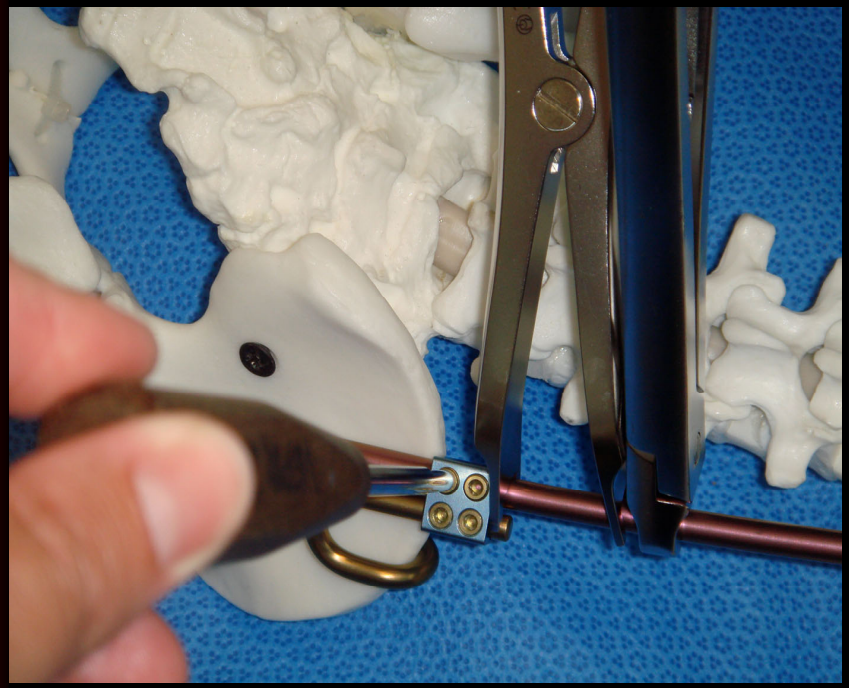
Technique

- Separate oblique incisions
- Seat hook on ileum just lateral to the erector spinae
- “Reversing” hook moves saggital balance forward (but hard to revise…)





Surgical Technique:
Distraction against the pelvic fixation

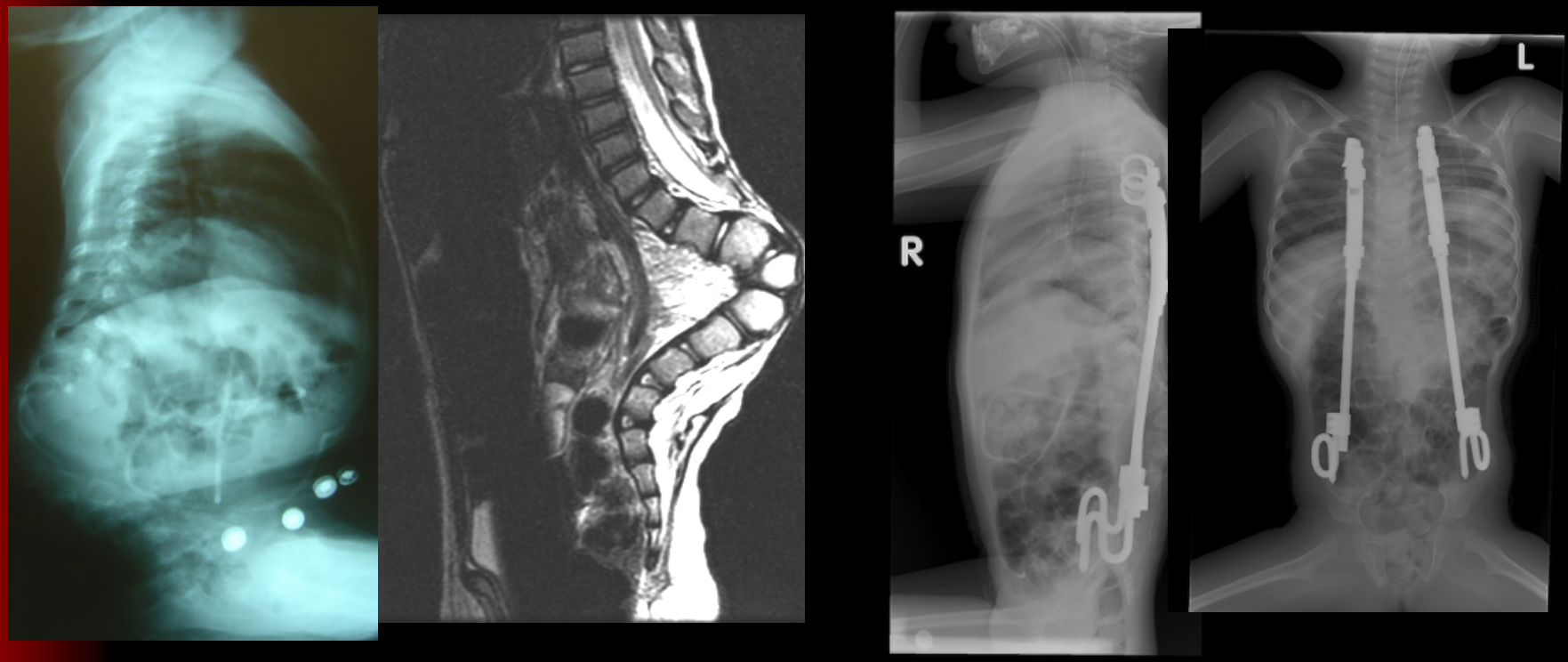


When do I use pelvic “S” hooks?

Myelodysplasia

- Saggital and coronal deformities
- Avoids poor midline skin
- Avoids spine anchors

18 month old child with kyphosis of Myelodysplasia

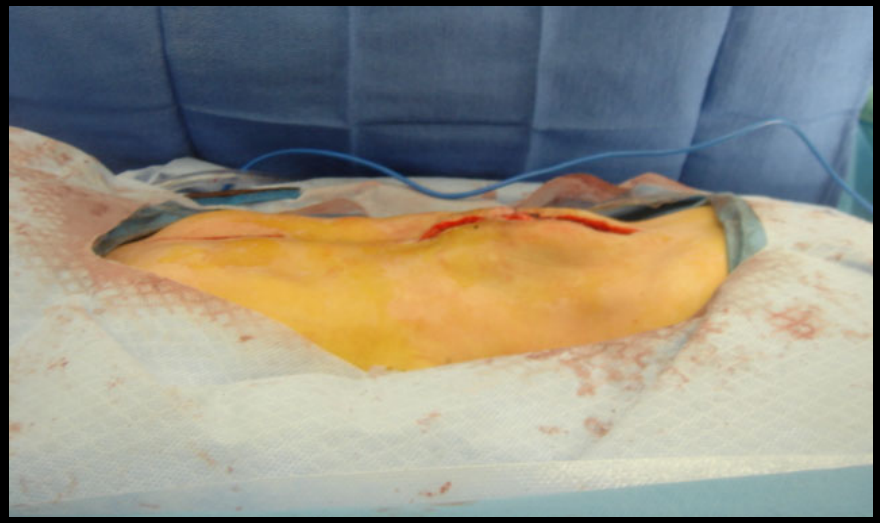


Smith et al; JBJS, October 2010

Intra operative

Prior to VEPTR insertion

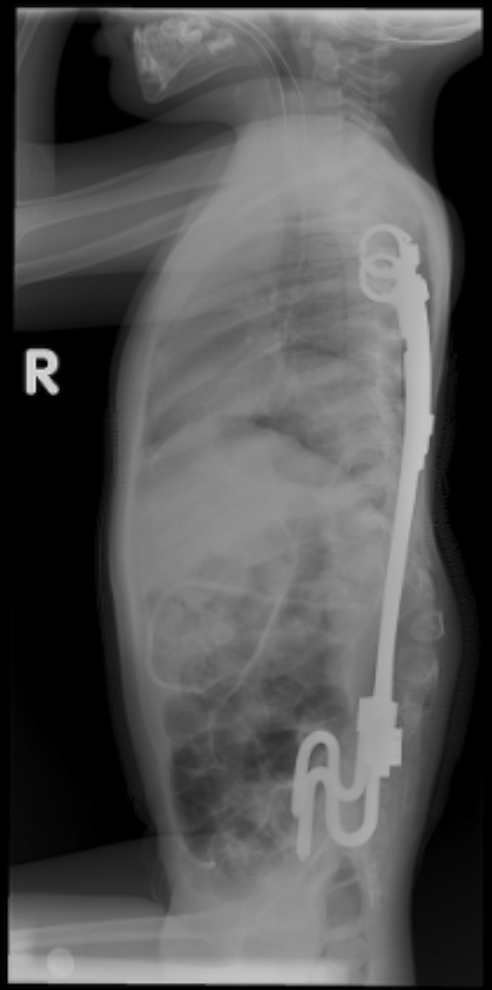
Skin expanders in place

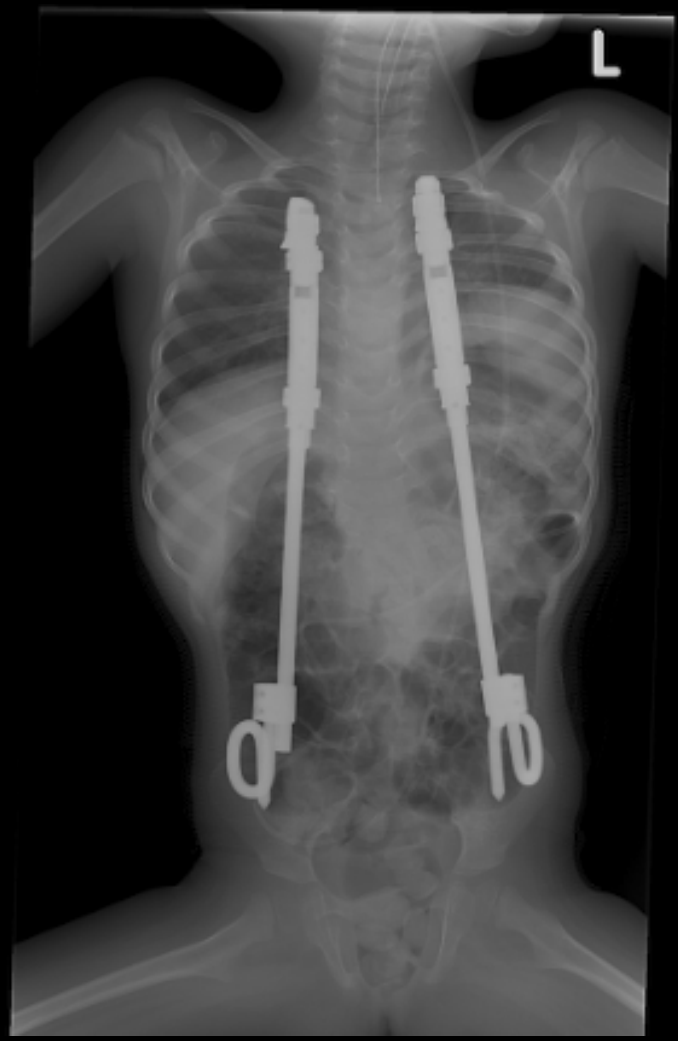


Post VEPTR insertion

No vertebral resection

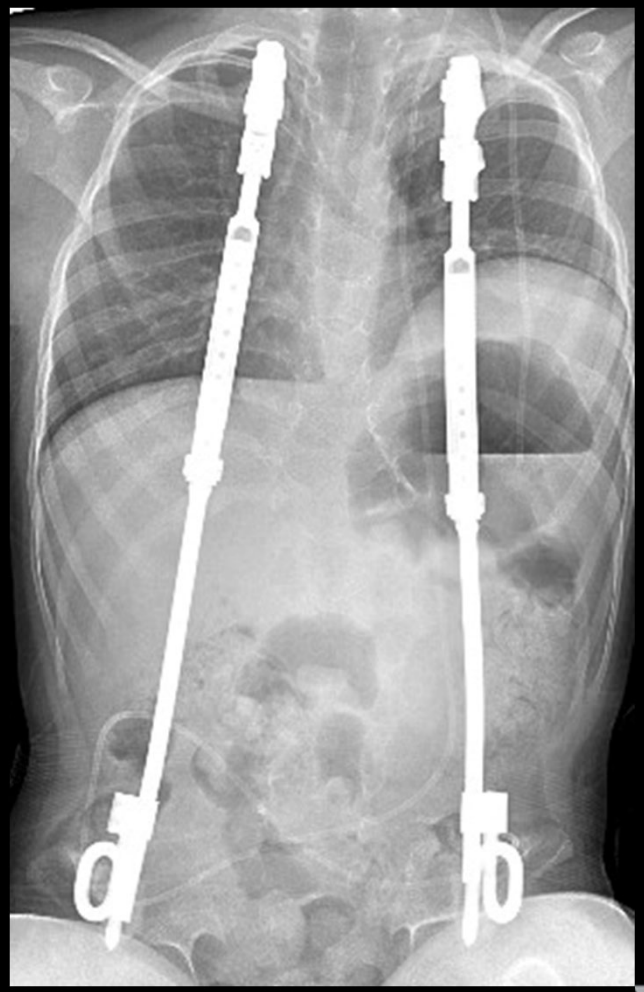
1 Month Post-op



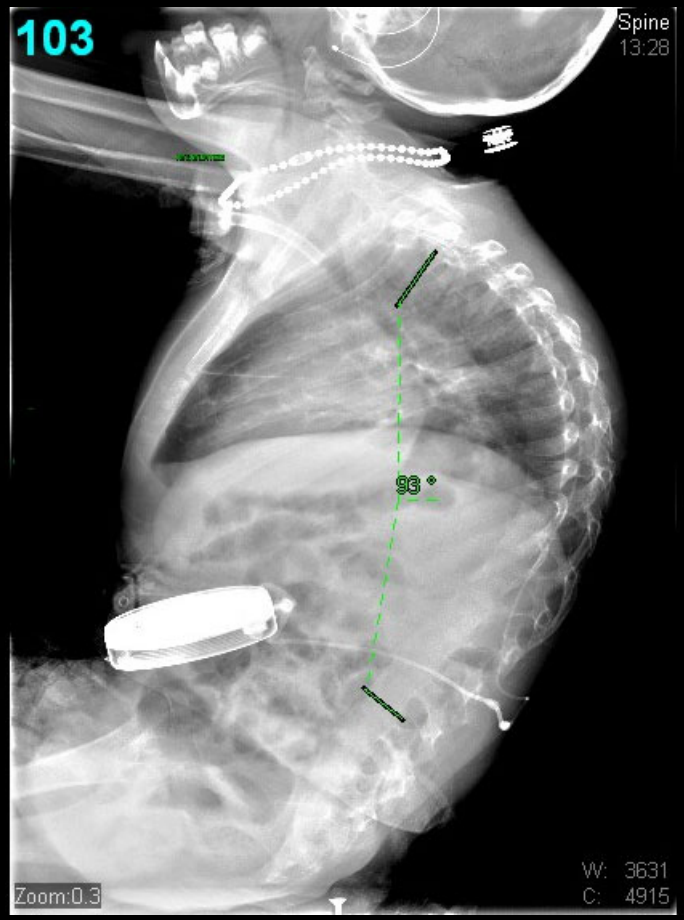


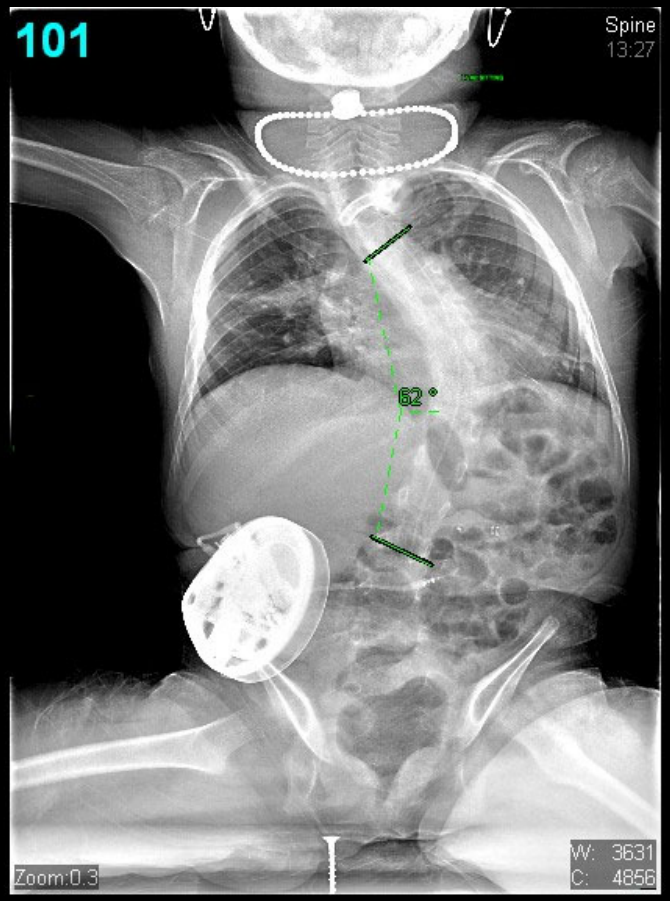
2 years after initial implant and expansions

4 Year follow-up after exchange to VEPTR 2 Devices

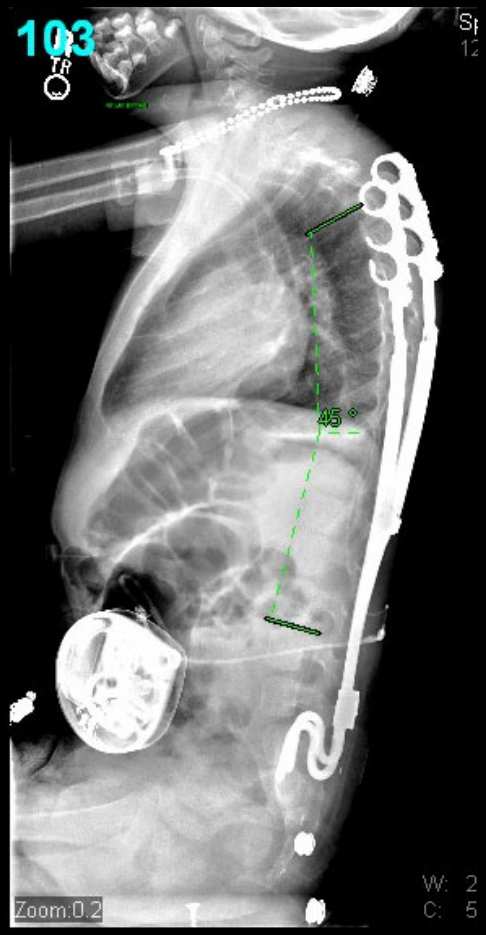


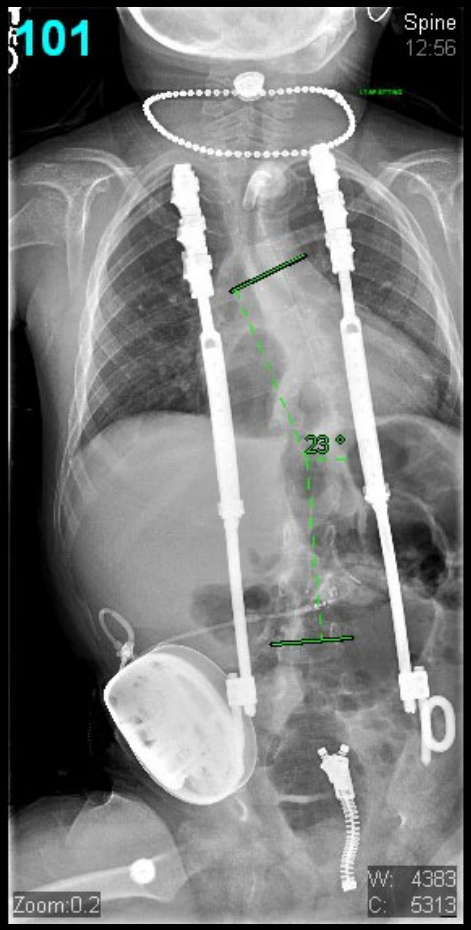
Spastic Quadriplegia



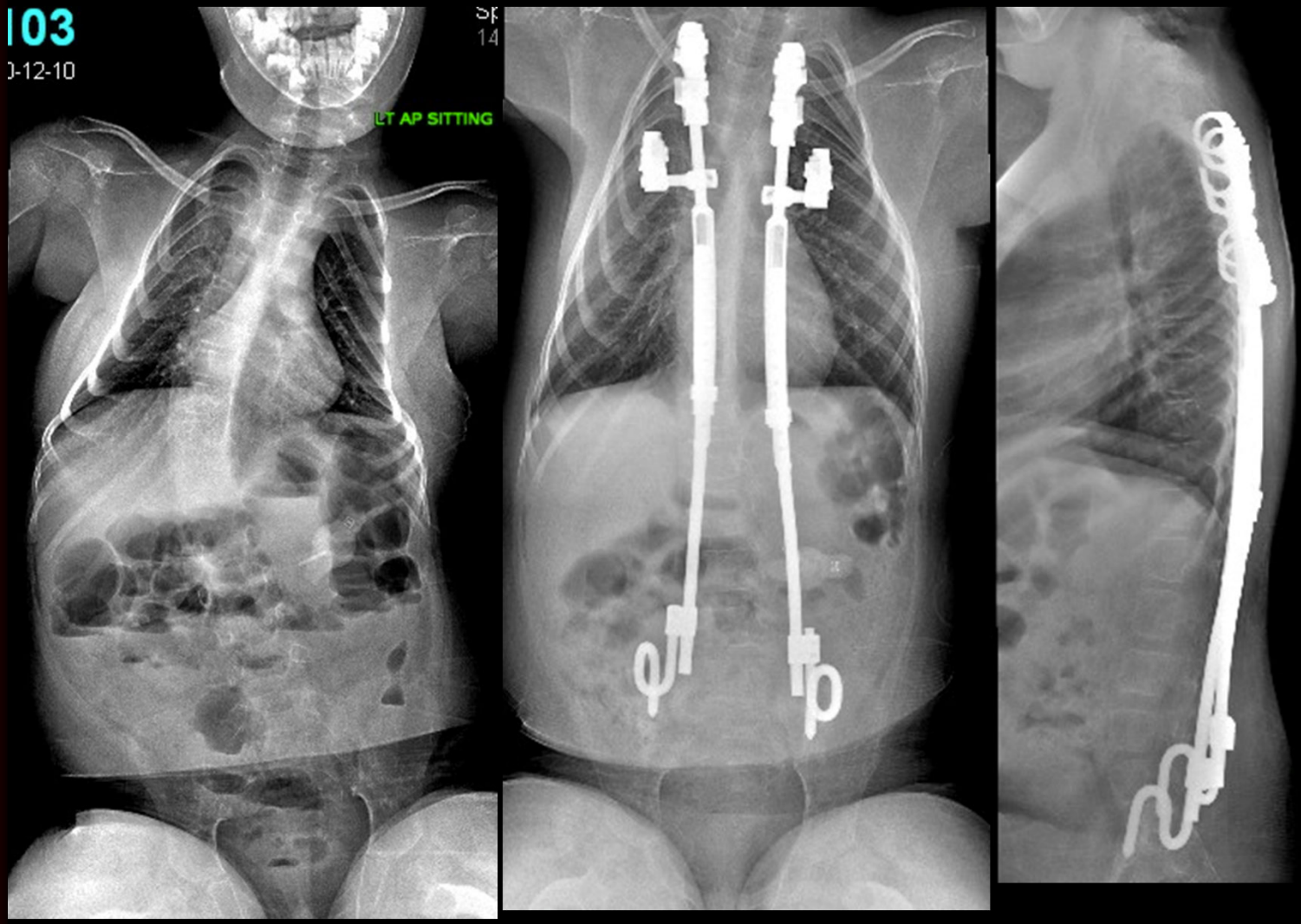


month after bilateral rib to pelvis VEPTR 2 vith 3 stacked rib hooks

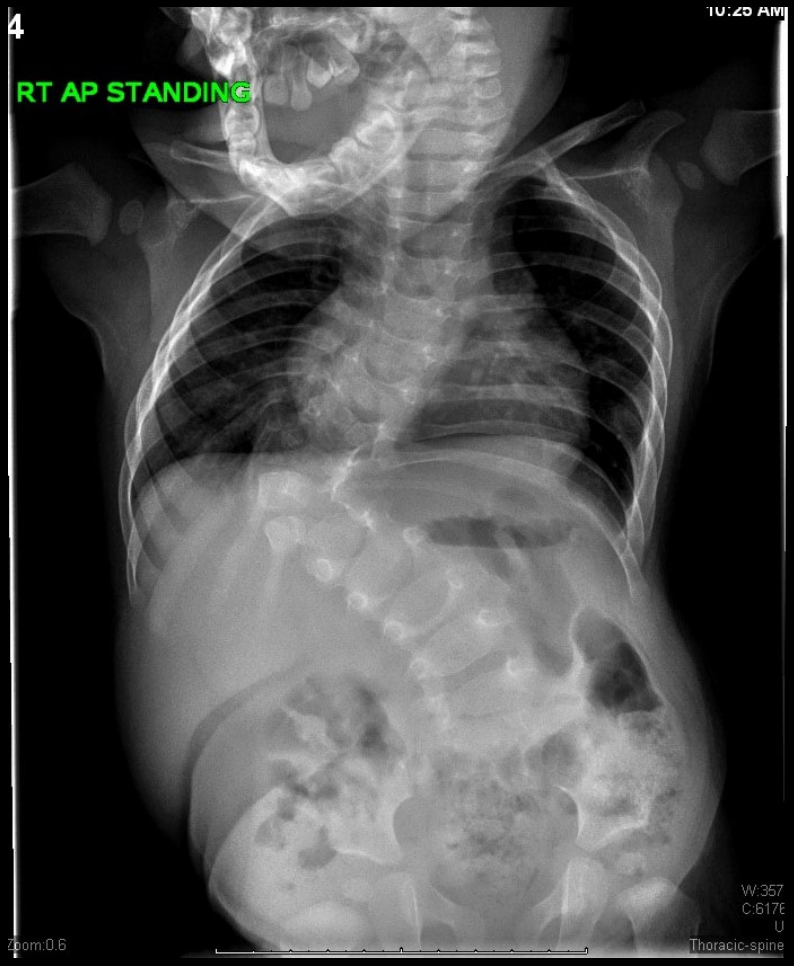


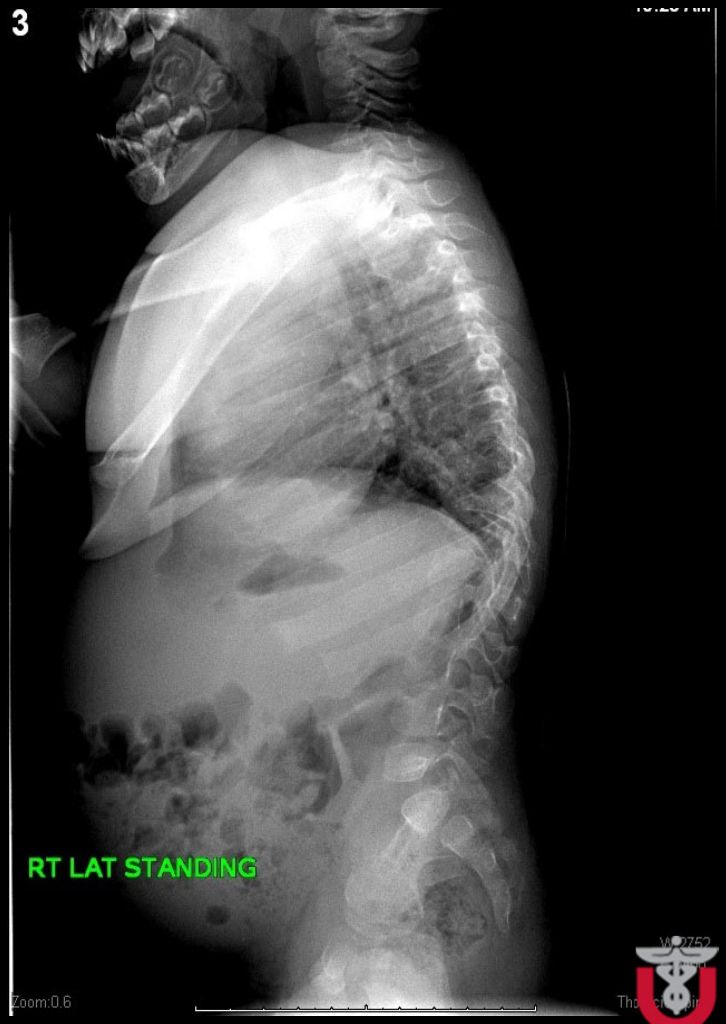


Congenital Myopathy

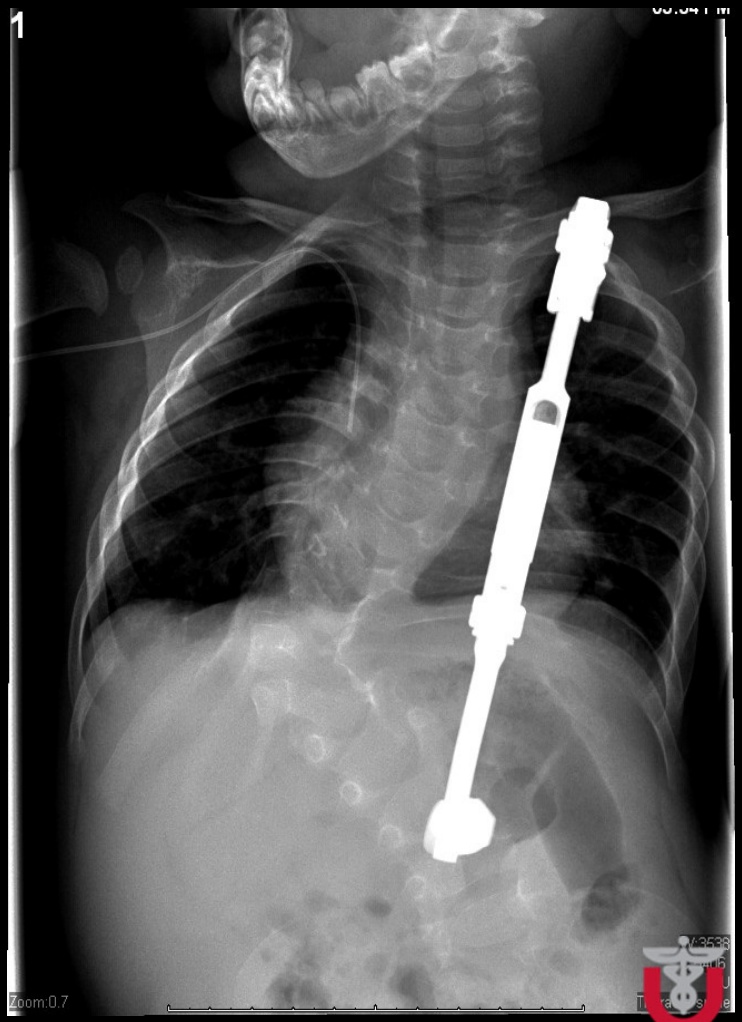


Salvage Situations: 2 y/o male with severe congenital scoliosis

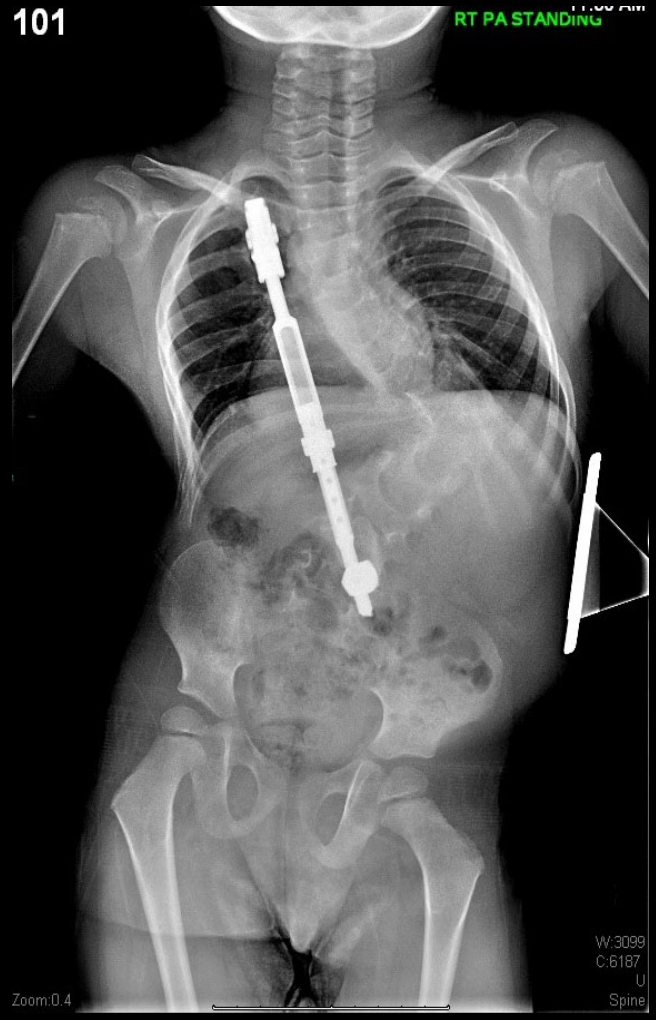


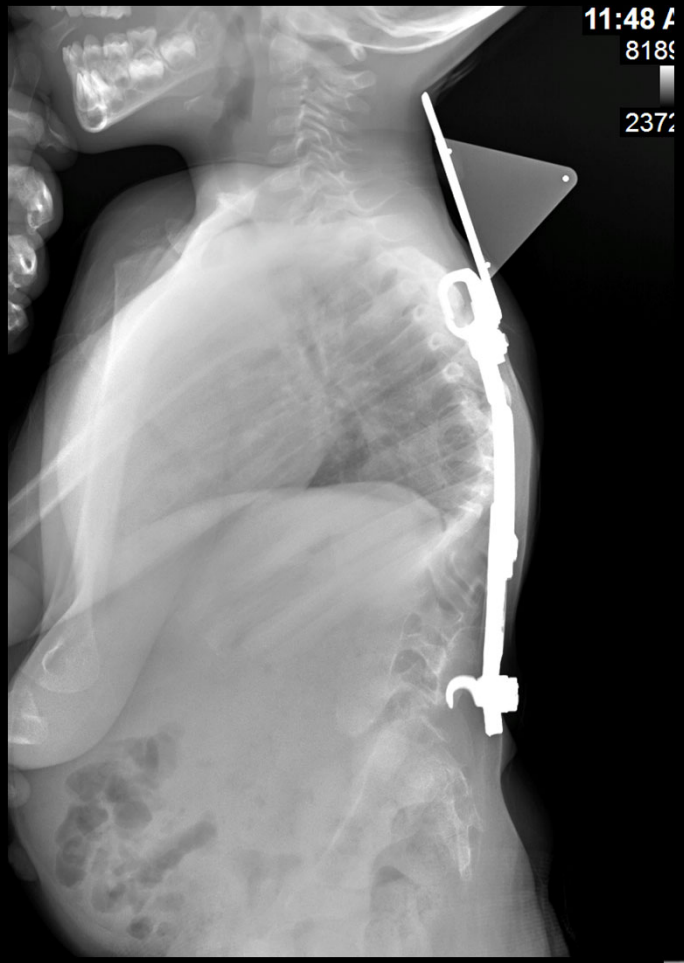


Initial Rib-Spine VEPTR

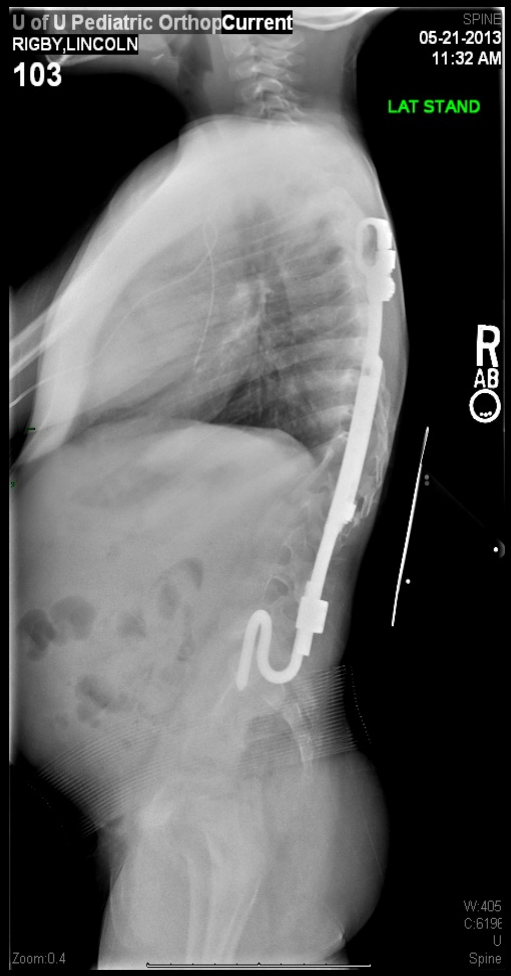


Trunk imbalance after multiple expansions





Revision to rib-pelvis construct



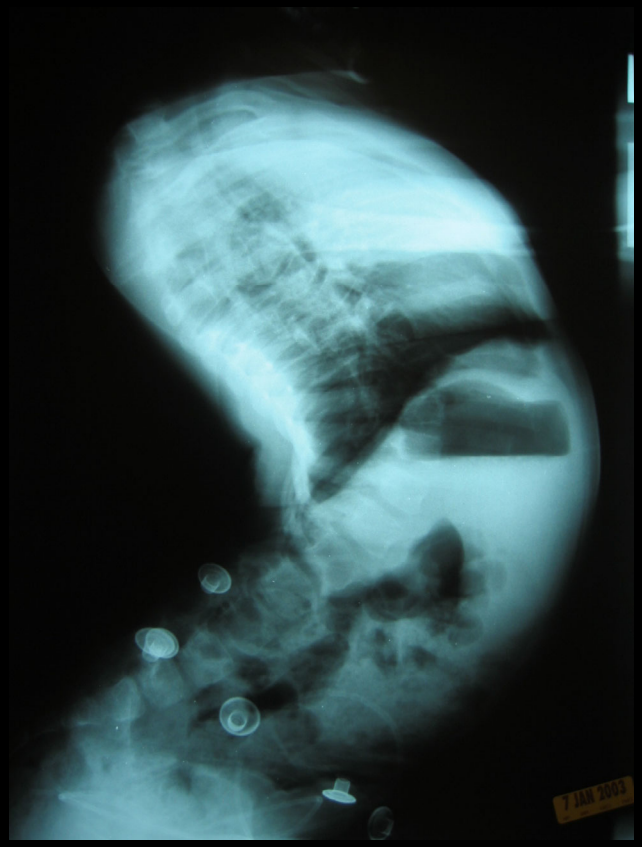
When do I not use pelvic hooks?

- Ambulators
- Forward shift in saggital balance over time in at least 44%

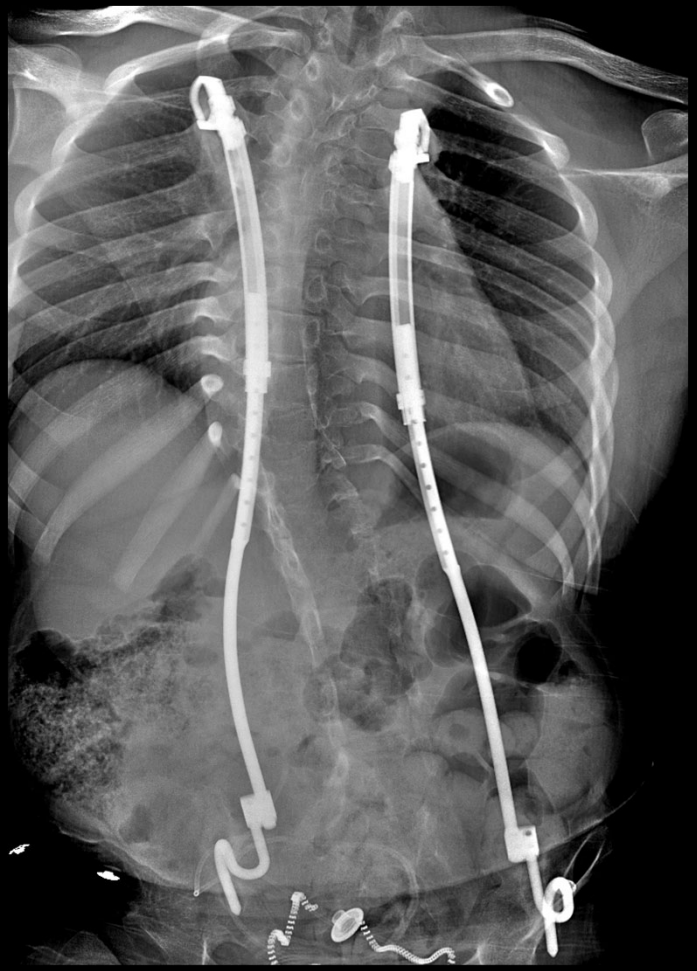
Smith, JT; CORR, 2010

What is the end point using “S” hooks at maturity?

- Usually buried in pelvic bone
- Generally not prominent
- Often leave in place at the time of graduate surgery.
- May not always require fusion to the pelvis at maturity



Multiple expansions to age 15



Final Fusion Age 15

What are the potential problems with "S" hooks?

- Prominence in thin children
- Wound dehisence/infection
- Migration over time

Concerns about Illiac screws

- Midline exposure at the LS junction
- Requires fusion to the pelvis at maturity?
- Bulky? (S2AI less prominent…)

Conclusions

- “S” hooks are ***one*** option for distal fixation using distraction based implants
- Useful in non-ambulatory children
- “S” hooks do not require midline exposure which may be beneficial over time
- New pelvic saddles may be better

Thank You

The Grand Teton,
August 6, 2014