Challenges in management of thoracic kyphosis with growth sparing implants: Growth Guidance Procedure

Scott J. Luhmann, MD

Professor of Orthopaedic and Neurological Surgery

Children's HOSPITAL • ST. LOUIS
BJC HealthCare

ICEOS Precourse
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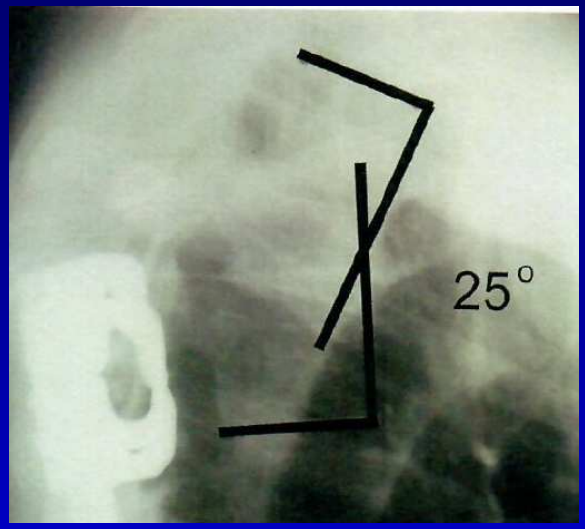
SCHOOL OF MEDICINE

Disclosures

- The author and co-authors have financial relationships with the manufacturer(s) of commercial product(s) and/or provider(s) of commercial services discussed in this study.
- Relevant disclosures:
  - Royalties: Orthopaediatrics, Medtronic
  - Consulting: Orthopaediatrics

PJK



- Definition (Glattes)
  - UIV+2 ≥ 10 degrees
  - Change in UIV+2 ≥ 10 degrees
- Frequency of PJK in TGR/MCGR: 20-29%
- Risk factors
  - LIV at L3 or higher
  - Preop kyphosis ≥ 40 degrees
  - Other

Growth Guidance Screws

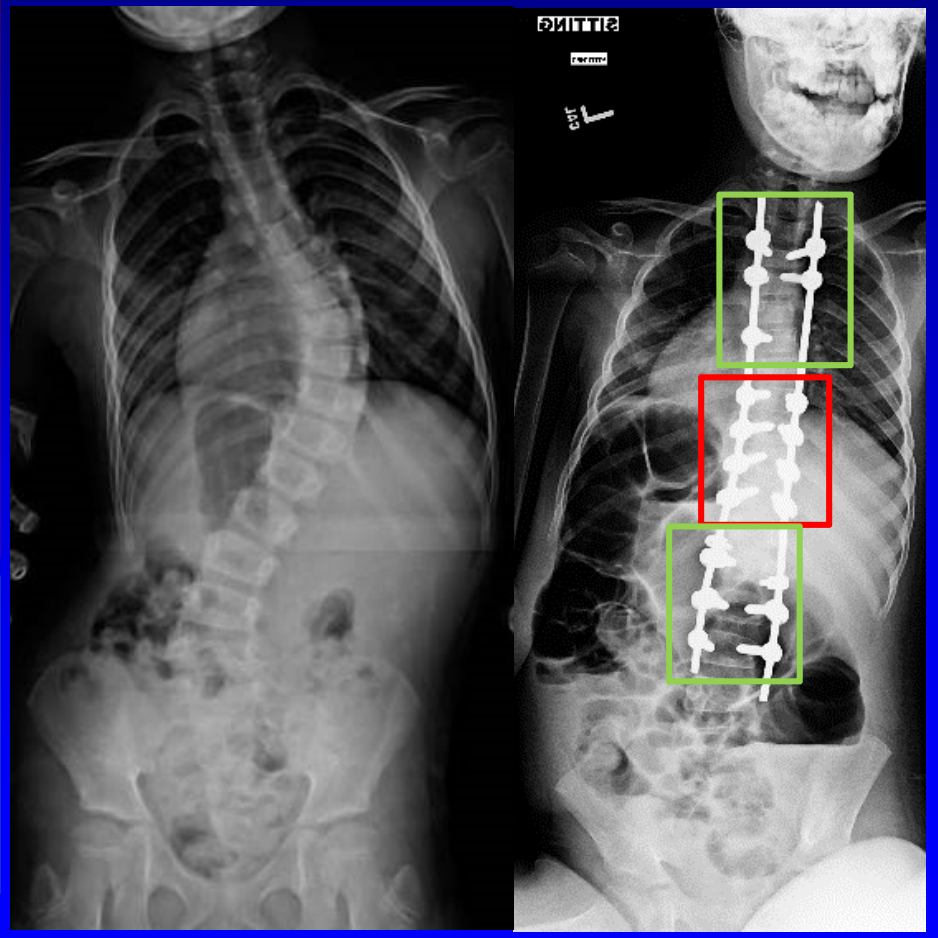
- Polyaxial screws
- GG set caps
- Rod captured but not significantly constrained

LS1

Growth Guidance constructs

- Apical
  - Fusion 2-4 of levels
  - PS fixed to rod
  - PCOs
  - +/- VCR or hemivertebra resection
- Cephalad and caudad
  - GG screws
  - Rods glide on PS

9 y/o, 51#
undiagnosed syndrome



T8-T11 apical fusion
GGST3-L3

LS1 marissa carr

Luhmann, Scott, 10/29/2019

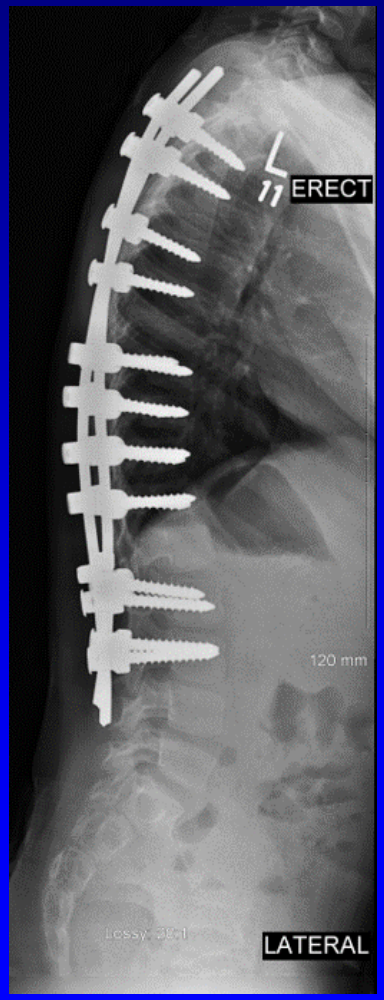
Growth Guidance constructs

- Frequency of PJK: unknown; infrequent
  - No cephalad revisions for PJK
- Reasons we don't see PJK in GGS
  - No cephalad dissection to place screws
  - Image-guided

Photos courtesy Dr. Rick McCarthy

Growth Guidance constructs

- Reasons we don't see PJK in GGS
  1. Sagittal contour of cephalad rod into kyphosis, avoids rod prominence
  2. "Sloppy" cephalad fixation



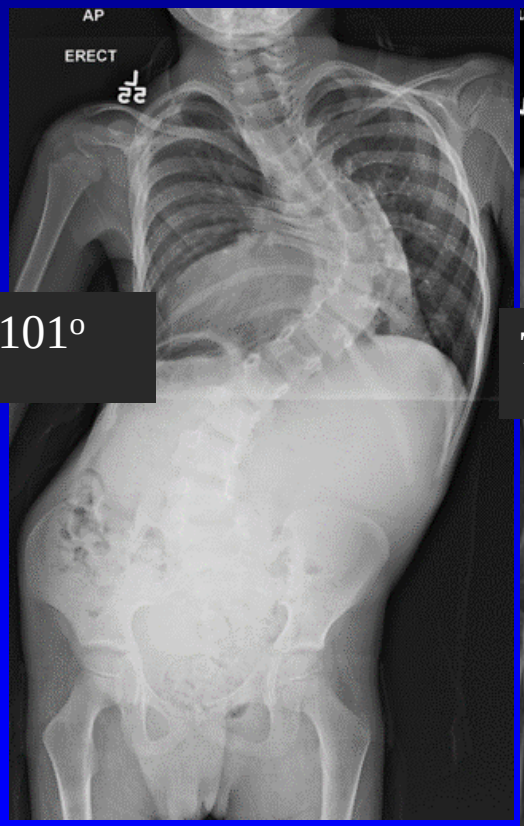
Growth Guidance constructs

- Reasons we don’t see PJK in GGS
  - UIV+1 should be neutral or lordotic. Do not end instrumentation if kyphotic cephalad to UIV
  - Correct kyphosis
    - Preop: HGT
    - Intraoperative: Hemi resection, VCR

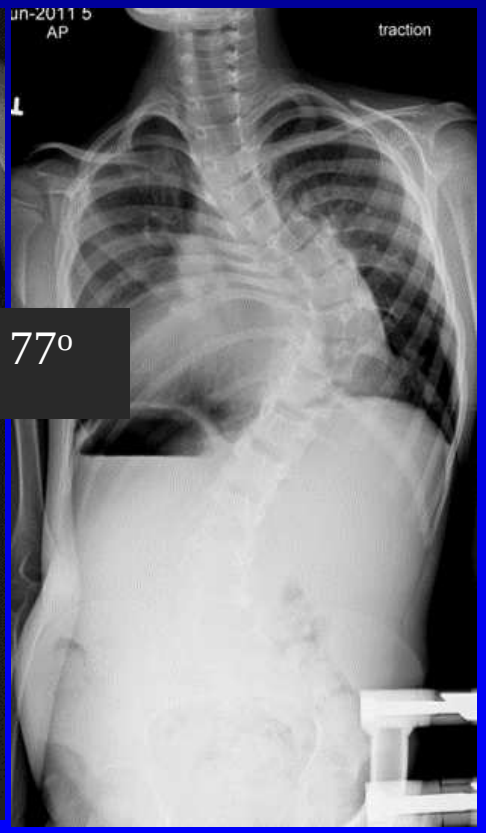
LS2

4 y/o male Marfan's 6 weeks HGTx

18# HGT
6 weeks

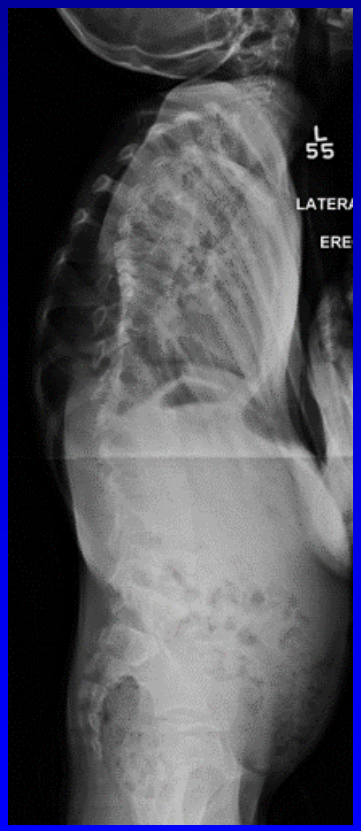


101°



77°

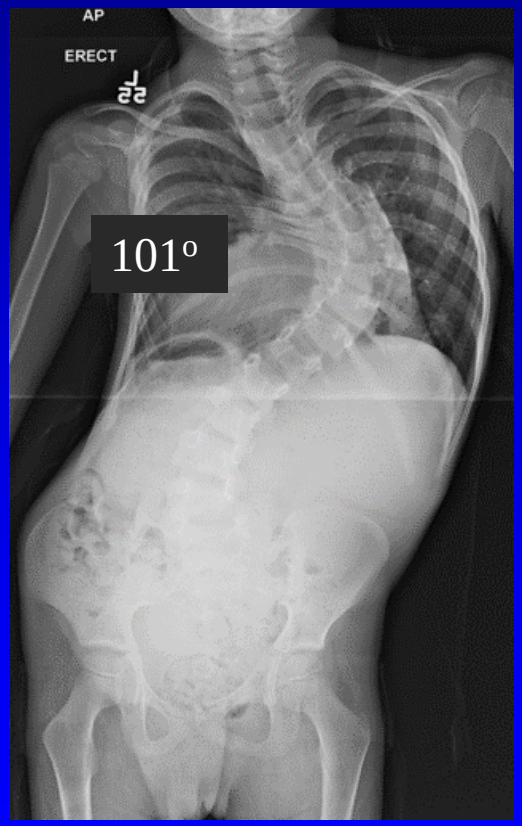
18# HGT
6 weeks

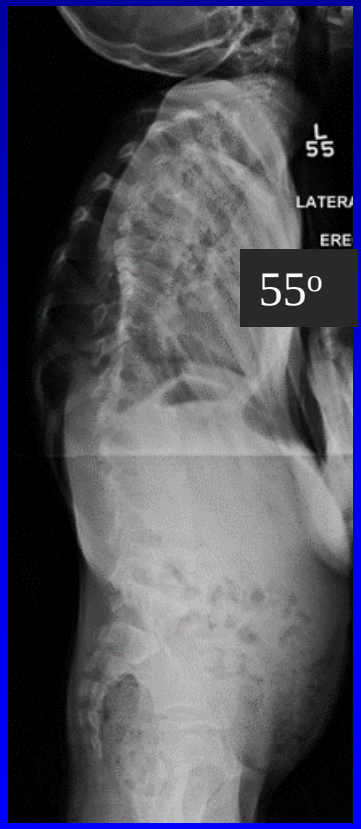


LS2 Thomas Nelson

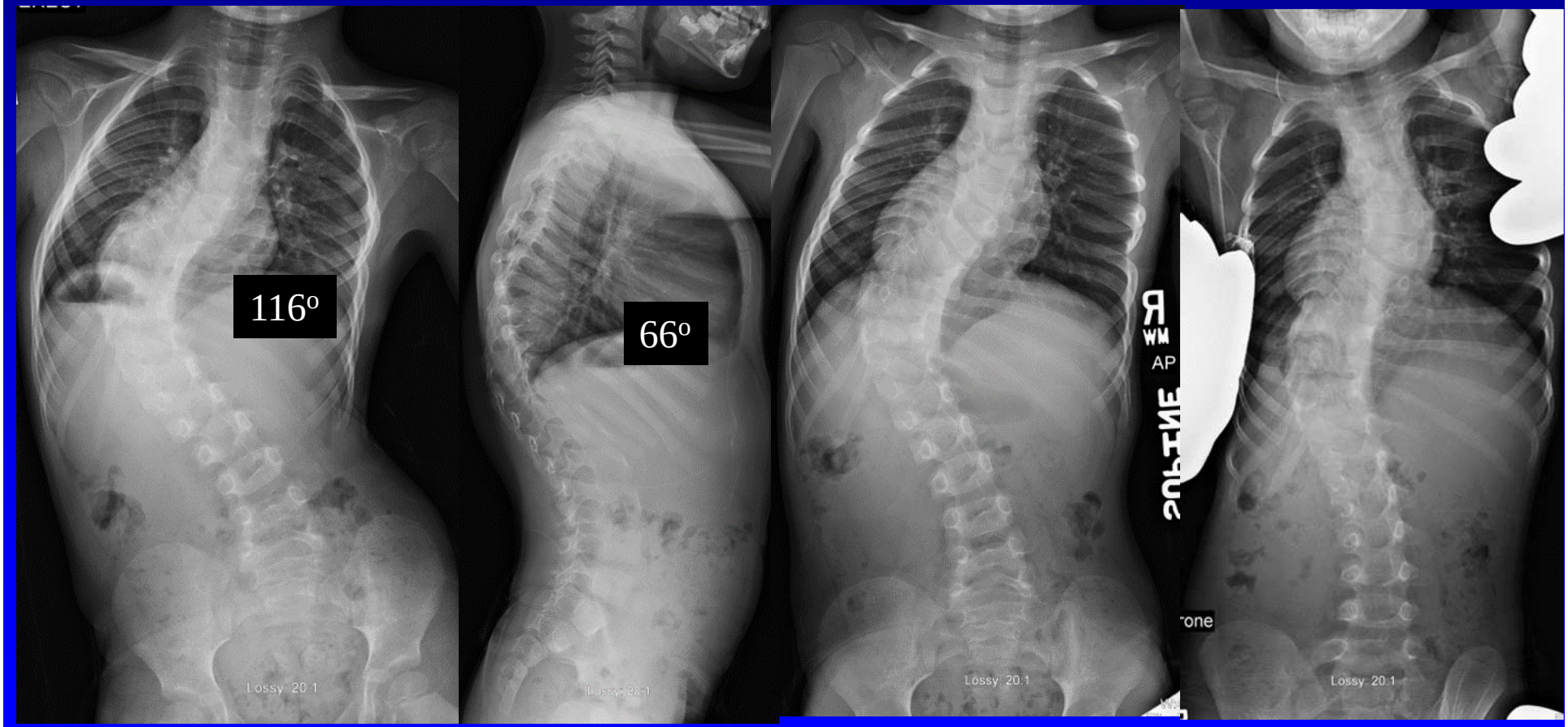
Luhmann, Scott, 11/4/2019

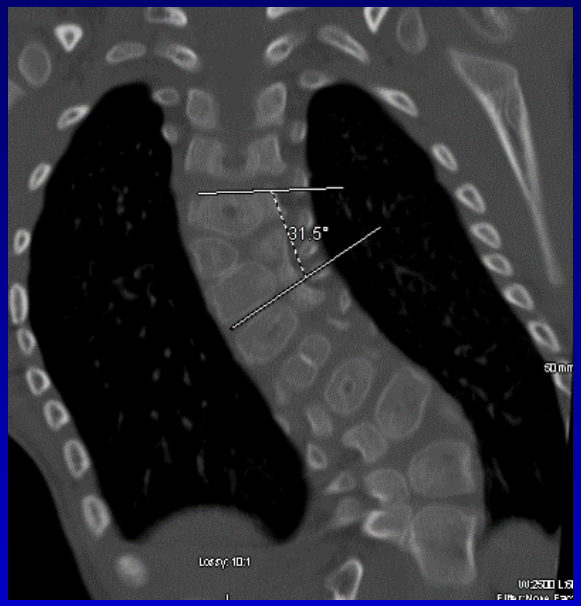
2 years postop; T2-L3 GGS; Apical fusion T6-T10

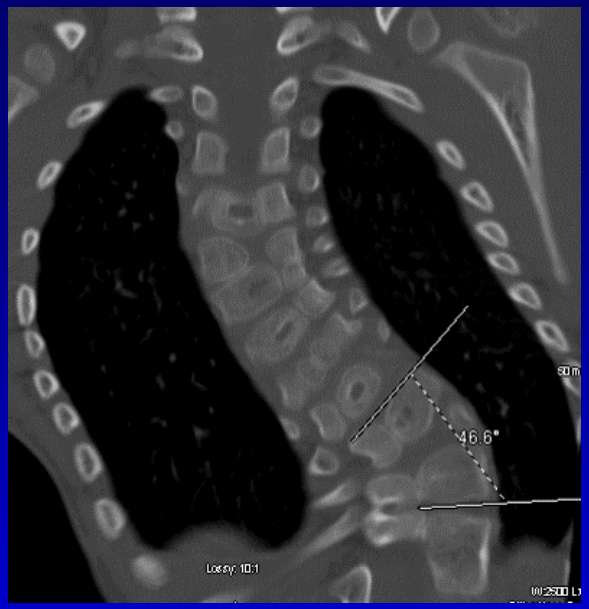


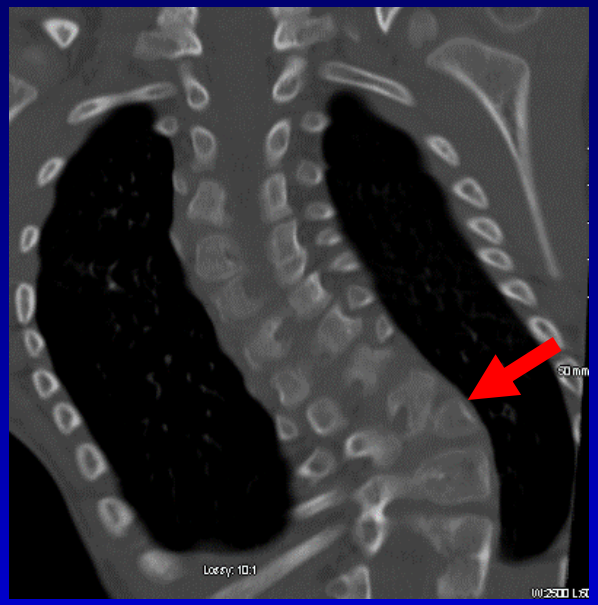


4 y/o male Mixed-Type Congenital Scoliosis




31.5°
Lossy: 10:1


46.6°
Lossy: 10:1

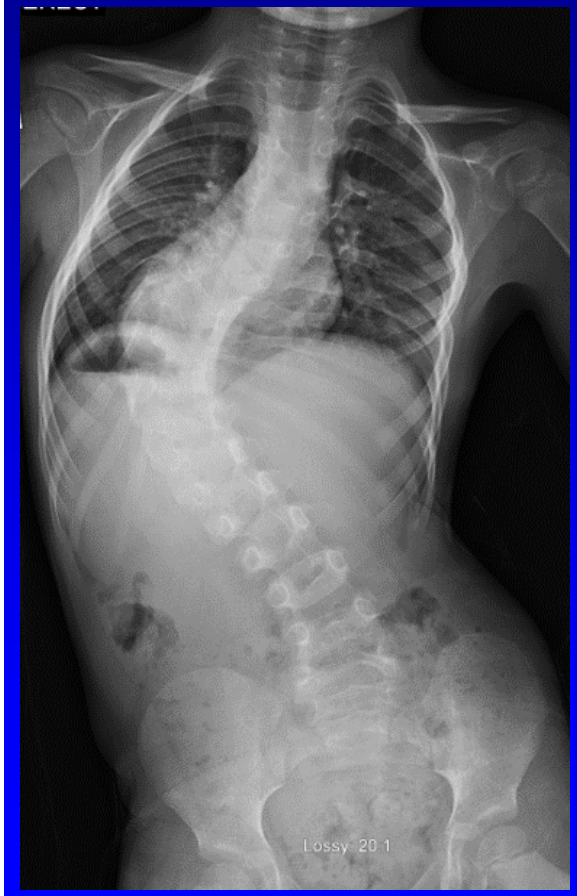

Lossy: 10:1

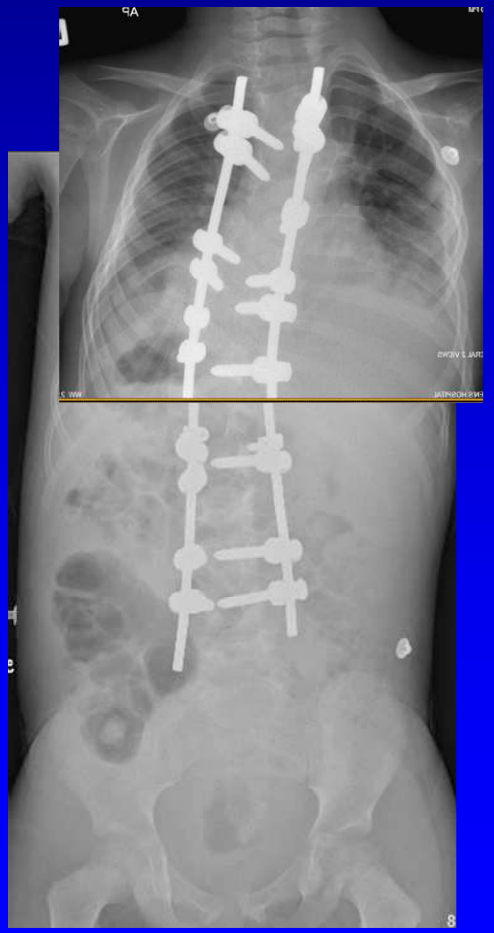

Lossy: 10:1

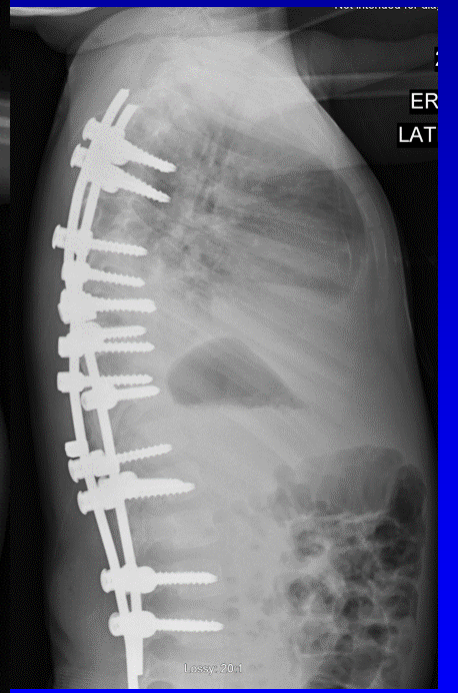

Lossy: 10:1


Lossy: 10:1

T4-L4 GGS; L T10 hemivertebra resection; T8-T12 apical fusion

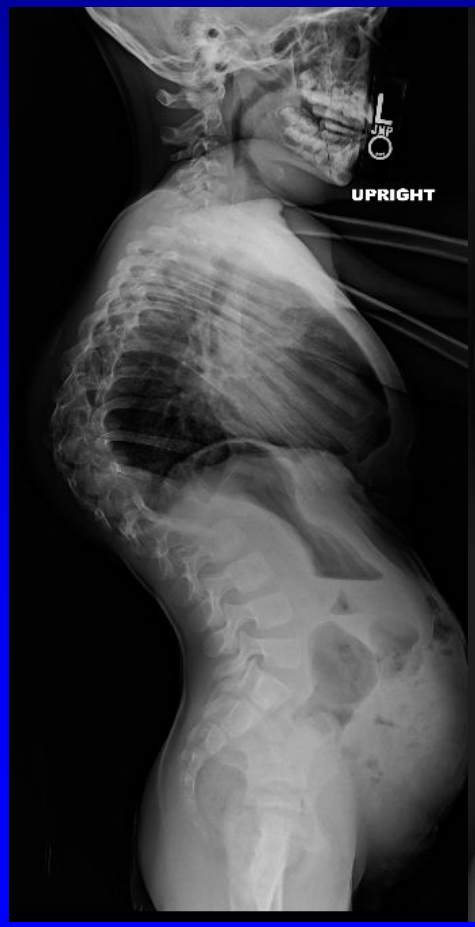






6+8 y/o male; Prune Belly
T3-L3 GGS; T9 VCR

9+8 years
3 years postop
1 revision



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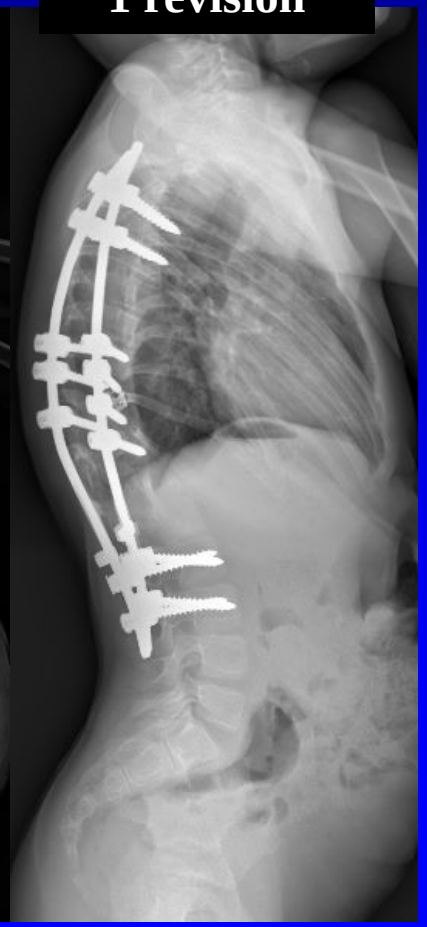
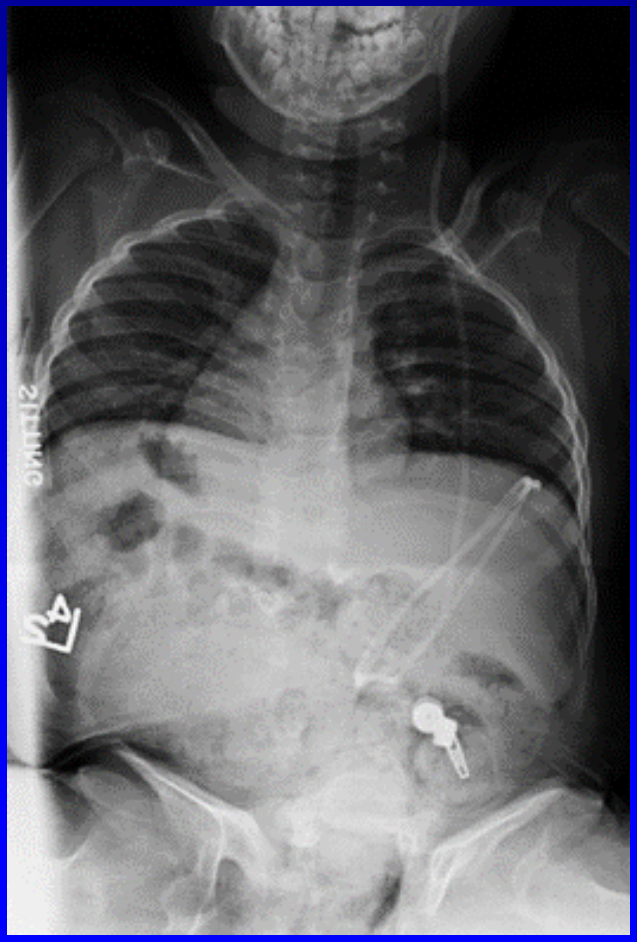
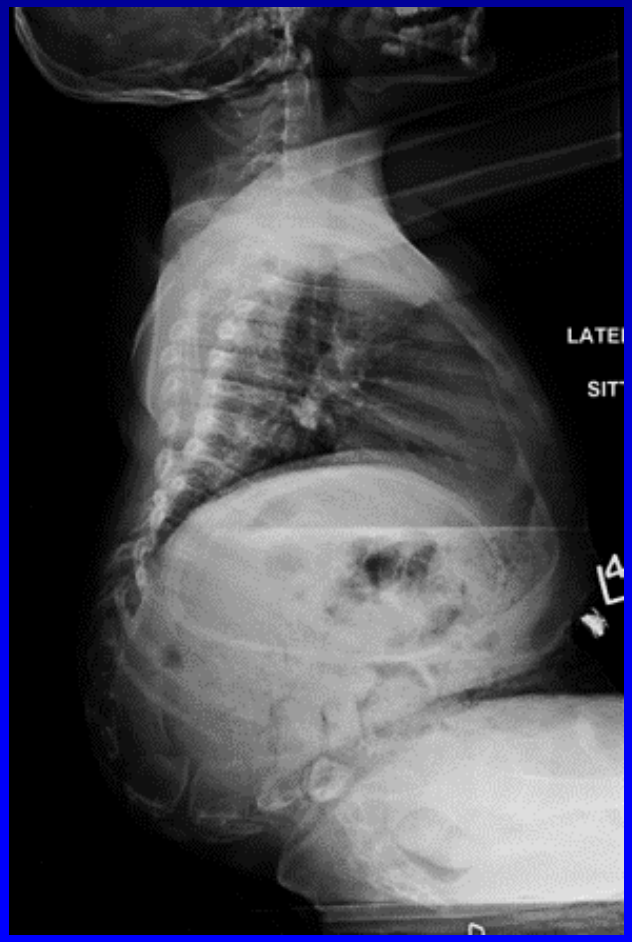
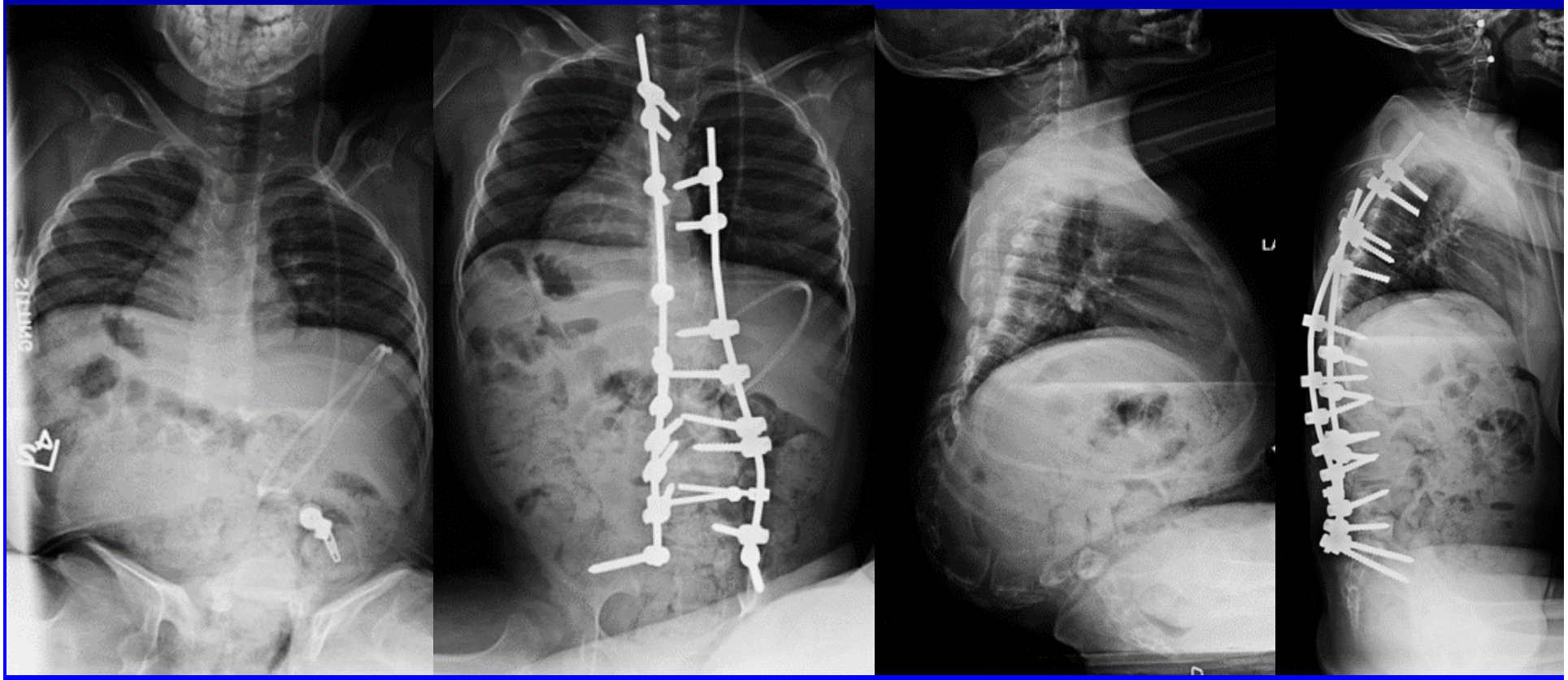


8 y/o female; MMC
Rigid Gibbus



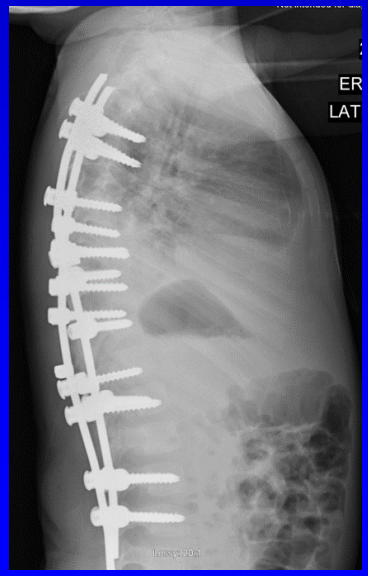


T3-Pelvis GGS; Cordotomy; L1-L2 VCR; Apical fusion T11-S1



Conclusion

- Low frequency of PJK
  - Minimal dissection
  - Nature of construct: GGS
  - Rod contouring
  - Level selection
  - Correction of kyphosis
    - Preop HGTx
    - Hemivertebra resection, VCR



Thank you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