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

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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
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
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
4 y/o male Marfan’s
6 weeks HGTx

18# HGT
6 weeks

18# HGT
6 weeks
2 years postop; T2-L3 GGS; Apical fusion T6-T10
4 y/o male Mixed-Type Congenital Scoliosis
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
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