Alternatives to KAFOs & Crutches in L4

Myelomeningocele: Thinking (Anatomically) Outside the Box

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Background


Patient History

• 10 yo female with L4 myelomeningocele
• s/p 12 surgeries; T5-L4 spinal fusion
• Recurrent left tibial external rotation
• Last surgery 5 months prior to CGA (bilateral tibial derotation osteotomies)
Clinical Data

• Level 9 ambulator on G-FAQ
• No assistive device, solid AFOs
• NO pain during gait
• Knee ligamentous laxity
• Excessive axial tibial external rotation
• Shortened iliotibial band L>R
• Weak hip extensors/abductors L>R
Gait Data: With AFOs

- **Trunk Lateral Flexion**
- **Pelvic Obliquity**
- **Hip Add / Abduction**
- **Knee Varus / Valgus**
- **Pelvic Rotation**
- **Hip Rotation**
- **Tibial Rotation**
Gait Data: With AFOs

- Rapid trunk lean left
- Rapid pelvic depression
- Rapid hip IR + adduction
- Rapid knee ER + valgus

Etiology for rotatory knee instability???
Gait Data: With AFOs

Frontal Plane Kinetics

Hip Moment

Knee Moment

Valgus

Varus

Abd

Add
Rationale for Treatment Decisions

Rotatory instability at knee

Related to

• Weak hip abductors + extensors
• Shortened iliotibial band
• Impaired ligamentous support at knee?
• Absent popliteus, gastrocnemius f(x)
• Poor distal foot position
• Excessive forces during gait

Abnormal lower extremity kinetic chain biomechanics
Treatment Recommendations

- Functional MRI - knees
- External oblique transfer to GT
  - Augment hip abduction
- Release / lengthen iliotibial band
- Transfer ITB distally to popliteus origin to check excessive axial tibial ER
- Repair of disrupted / absent knee ligaments

KAFOs or crutches not acceptable!
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- Knee dysfunction may have causes other than “tibial torsion”
- Specific clinical exam measures crucial (e.g. axial tibial rotation)
- Anatomically accurate kinematic models critical for clinical problem-solving