ANterior medial and posterior medial deformity of the tibia

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DISCLOSURES

• POSNA President and BOD member
• AAP Immediate Past Chair and Section on Orthopaedics Executive Committee
• K2M Consultant
• Medtronic Consultant
• Project Perfect World Board of Directors.
• Miracle Feet Medical Advisory Board.
LEARNING OBJECTIVES TIBIA BOWING

• Examine patient with open mind
• What is the direction of the bowing?
• Detect other associated abnormalities
• Understand the difference in the natural history of anterior lateral, anterior medial and posterior medial bow.
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BLOUNT’S DISEASE - CLASSIC BOW LEGS
ANTERIOR LATERAL BOW

• Classic for congenital pseudarthrosis tibia
• Diagnose by physical exam.
ANTERIOR LATERAL BOW

- Classic for congenital pseudarthrosis tibia
- Diagnose by physical exam
- NF1- skin can tell us a lot
SELF ASSESSMENT
QUESTION

• 4 month old B popliteal pterygium syndrome 100 deg KFD. Future Rx?
  • 1. Serial weekly casting.
  • 2. PT dynamic splinting.
  • 3. Releases, skin Z-plasty, excise bands, posterior knee capsular release.
  • 4. Femoral shortening ostetomies with extensive soft tissue releases.
  • Gradual correction with external fixators, no releases.
SELF ASSESSMENT QUESTION

• 4. femoral shortening osteotomies with extensive soft tissue releases.
• >60 degree deformity is difficult to correct.
• Can see ischium to calcaneus band
• Sciatic nerve near band
• Can get iatrogenic tibia deformity-recurvatum with posterior bow if excessive physical therapy.
• 20-40 deg-hamstring lengthening and splinting.
• >40 deg- femoral shortening or fixator with soft tissue releases and postoperative splinting.
FIBULA HEMIMELIA

- Most common longitudinal deficiency of the long bones
- 1 per 50,000-135,000 live births
- No genetic transmission
- Spectrum from mild fibula shortening to complete absence with tibia shortening
- 75% have anomalies in the femur and knee laxity
- Foot deformity: valgus, absent lateral rays, coalitions (tarsal 50%, also ray)
- Variable anterior (valgus) tibia bow (±dimple)
- Ankle needs reconstruction before any attempt at lengthening
ANTERIOR MEDIAL BOW

• 3 year old boy with fibula hemimelia
• Notice dimple over the tibia and 3 toe foot

• 5 main problems with the limb
  • Limb length discrepancy
  • Foot and ankle deformities and deficiencies
  • Tibia deformity
  • Genu valgum
  • Knee instability
    • Paley 2016
INDICATIONS FOR TREATMENT IN FIBULAR DEFICIENCY

• Parent education and contact with other families.
• Limb preservation and correction:
  • 4 or more rays in foot
  • < 8 cm predicted LLD
  • Stable, mobile ankle, plantigrade foot
  • Access to multidiscipline team.
• Amputation
  • >25 cm LLD at maturity
  • Poor foot and ankle

• Herring JA, Birch JG. Child with Limb Deficiency, Shriners Symposium 1997
FIBULAR HEMIMELIA, CLASSIC OUTCOMES

• Children with lengthening did well, but children with amputation and prosthesis at 1.2 years of age did even better.
  • McCarthy 2000
• Patients with Syme amputation at average 15 mo were more active than those using extension prosthesis. Did not need the kyphus corrected.
  • Eastwood D 2017
• Much enthusiasm now for foot reconstruction then lengthening
  • Paley 2016, Hefny 2017
SELF ASSESSMENT EXAMINATION

- Newborn images. What is best course of action?
- 1 genetic testing
- 2 stretching exercises performed by the parents
- 3 series of corrective plaster casts
- 4 long leg orthosis to control the foot and leg
- 5 surgical lengthening of the anterior tibial tendon and a short leg cast.
SELF ASSESSMENT EXAMINATION

• Answer: 2 stretching exercises performed by the parents

• Posteromedial bowing of the tibia and calcaneal valgus. Both thought caused by positioning. Long term problem is LLD.
  • Hofmann A, Wenger DR. JBJS 1981.
POSTERIOR MEDIAL BOW

- Confused with calcaneous valgus foot
- Corrects rapidly during first year then up to 4 years.
- Have greater shortening with worse deformity.
  - Pappas AM 1984
- Corrects more through the physis than the diaphysis
- May have 5-7 cm or more limb length discrepancy at maturity
  - Shah HH 2009
POSTERIOR MEDIAL BOW

• Follow until maturity.
• Compared to conservative treated, surgical treated had more complications, but corrected the LLD
• Recommended corrective osteotomy and lengthening near end of growth.
  • Johari A
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• Pappas AM. Congenital posterior medial bowing of the tibia and fibula. JPO A 1984 Sep:4(5):525-531
