Fractures of the Ankle and Foot in Children

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Medial Malleolar Fractures Salter-Harris Type III and IV

- Mechanism
  - Supination-inversion
- Radiographic Evaluation
  - AP/Lateral/Mortise ± CT
- Acceptable reduction
  - <2mm of displacement
    - Arthritis and Growth arrest
medial malleolar fractures

- Treatment
  - Closed reduction and casting
  - Closed reduction ± Pinning and casting
  - Open reduction and internal fixation
    - Intraepiphyseal pinning or screws
- Follow-up
  - Until normal growth apparent
Lateral Malleolar Fractures
Salter-Harris Type I and II

- Mechanism
  - Supination-inversion
- Radiographic Evaluation
  - A-P/Lateral/Mortise
- Acceptable Reduction
  - Normal ankle mortise
lateral malleolar fractures

- Treatment
  - Closed reduction and casting
  - Closed reduction and intramedullary or obliquely inserted pin
  - Open reduction and internal fixation
  - Rare
Growth Regions

Strongest (1st) = Middle 1/3
Weak (2nd) = Medial 1/3
Weakest (3rd) = Lateral 1/3
Juvenile Tillaux Fractures

- “Transitional” fracture
- Mechanism
  - External rotation of the foot
- Radiographic Evaluation
  - A-P/Lateral/Mortise ± CT
- Acceptable Reduction
  - $\leq 2$mm of displacement
juvenile tillaux fractures

- Treatment
  - Closed reduction and casting
  - Internal rotation of the foot and direct pressure on the fragment
  - Dorsiflexing the pronated foot + above
  - Closed reduction ± pin or screw fixation
  - Open reduction and internal fixation (screw)
Triplane Fractures

• Mechanism
  - Lateral: external rotation
  - Medial: adduction and axial load

• Classification
  - Two-part, three-part, and four-part fractures
    - Lateral or medial
  - Intramalleolar variant (extra-articular)
triplane fractures

- Radiographic Evaluation
  - A-P (S-H III), Lat (S-H II), Mortise ± CT
- Acceptable Reduction
  - ≤2mm of displacement or extra-articular
triplane fractures

- Treatment
  - Closed reduction and casting
    - Lateral: internal foot rotation
    - Medial: abduction
  - Closed reduction + screws
  - Open reduction and Internal Fixation
    - Screws (avoid physis)
Metatarsal Fractures

• Mechanism
  - Direct or indirect trauma
  - Abduction and/or forced plantarflexion
  - Torsion
  - ”bunk-bed fracture”
    - prox. first metatarsal, lateral cuneiform & less often medial cuneiform impacted
metatarsal fractures

- Radiographic Evaluation
  - A-P, Lateral, and oblique

- Acceptable Reduction
  - ?
metatarsal fractures

- Treatment (shaft and neck fractures)
  - Closed reduction and casting
  - Traction and reduction
  - Closed reduction and pinning
  - Open reduction and intramedullary pinning
Phalynx Fractures

- Mechanism
  - Direct trauma
- Radiographic Evaluation
  - A-P, Lateral, and oblique
- Acceptable Reduction
  - ?
phalynx fractures

- Treatment
  - Closed reduction and taping vs casting
    - Traction and reduction
  - Closed reduction and pinning
  - Open reduction and intramedullary pinning