Coalitions of the Foot

- Historical facts: First described by Buffon in 1769
- Coalition: abnormal connection that develops between 2 bones
  - Type: Synostosis(osseous), synchondrosis (cartilaginous), syndesmosis (fibrous)
  - Location: Intra-articular/extra-articular(bar or bridge)
- Incidence and Etiology
  - Less than 1-2% incidence, Males > females (likely skewed), No race preference, 50% bilateral
  - Most common coalition of the foot: 5th distal and middle phalanges
  - Most common coalition of the rearfoot: TC(middle facet) > CN > TN
  - Congenital (90-95%) – mechanism unknown - several theories proposed
  - Acquired (5-10%): Traumatic (MC), metabolic, infectious, neoplastic, skeletal disorders.
  - Age of onset for rearfoot coalitions: TN (3-5 years), CN (8-12 years), TC (12-16 years)
- Clinical signs & symptoms: 20% asymptomatic and often incidental finding upon imaging
  - Deep and aching pain increased with activity and decreased with rest, limited ROM, muscle spasm, tonic muscle spasm, often rigid pes planovalgus foot type, and several associated disorders.
- Diagnostic Imaging:
  - X-ray: AP, lateral, MO, Harris & Beath (assess M. & P. facets)
  - MRI: study of choice (Jay 1990)
- Classifications: Buckholtz, Tachdjian and Downey
- Treatment:
  - Conservative: Orthoses, NSAIDs, BK casting 3-6 weeks, Intra-articular steroid injections, PT
  - Surgical: resection or fusion – must consider age, articular involvement, and presence of arthritis
    - TC coalition: must consider extent of posterior facet involvement and degree of heel valgus
    - Badgley bar resection (1927) of CN coalition
    - Grice-Green extra-articular arthrodesis of TC coalition

PROCEDURE RECOMMENDATION USING DOWNEY CLASSIFICATION SYSTEM:

- JUVENILE – IA (extra-articular w/no arthritis)
  - Resection with interposition of EDB muscle
- JUVENILE - IB (extra-articular w/ arthritis)
  - Triple arthrodesis
- JUVENILE IIA (intra-articular w/no arthritis)
  - Resection with interposition of arthroereisis
  - Isolated/single arthrodesis
  - Triple arthrodesis
- JUVENILE - IIB ((intra-articular w/ arthritis)
  - Triple arthrodesis
  - Post-op course:
    - Resection: Below knee cast x 3-4 weeks followed by aggressive PT
    - Arthrodesis: extensive post-op course including multiple casts and physical therapy
- ADULT - IA (extra-articular w/no arthritis)
  - Resection with interposition of EDB muscle
  - Triple arthrodesis
- ADULT - IB (extra-articular w/ arthritis)
  - Resection with isolated/single arthrodesis
  - Triple arthrodesis
- ADULT - IIA (intra-articular w/no arthritis)
  - Isolated/single arthrodesis
  - Triple arthrodesis
- ADULT - IIB (intra-articular w/ arthritis)
  - Triple arthrodesis
Purpose: To determine patient outcomes following resection of CN and TC bars & to explore the relationship between coalition size and resection outcome.

24 patients, <18 years old at time of resection, with 32 coalitions were evaluated.

- Mean age at time of surgery: 10-14 years
- Mean age at time of follow-up: 25-28 years

Findings:

- CN and TC bars resections provided similar long-term outcomes in terms of function and patient satisfaction which was determined using the American Academy of Orthopaedic surgeons and Foot Function Index scales.
- Inversion and eversion were significantly decreased for TC patients compared to CN patients.
- While previous studies suggest primary arthrodesis for TC coalitions greater than 50% of the posterior facet, this study reports favorable results with resection of TC coalitions greater than 50% of the posterior facet and hindfoot valgus angles greater than 16 degrees.

Works Cited


Downey MS. Keys to treating tarsal coalitions. Podiatry Today 2011;24:48-56
