Metatarsus Adductus
(When you really hope shoes will do the trick)

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I. Etiology
   • Usually a “packaging problem” in kids
     - Increased intrauterine pressure, fetal positioning
   • Muscle imbalance has been implicated in some series
   • Metatarsus Adductus in children rarely persists into adulthood, nor is it associated with hallux valgus (Weinstein Ponseti, JBJS 1994)

II. Perspective
   • 29-35% of patients with symptomatic hallux valgus have metatarsus adductus (MA)
   • Patients with MA may have 3.5X risk of developing hallux valgus
   • After surgical correction, patients with MA were twice as likely to have recurrence

III. Defining and Measuring Metatarsus Adductus (MA)
   • Many techniques for measurement described, no consensus

IV. Relationship with Hallux Valgus (HV)
   • In one series nearly 1 in 3 patients with hallux valgus had metatarsus adductus, and radiographic recurrence was twice as likely in the metatarsus adductus group. (Aiyer, Myerson)
V. **Associated Deformity**

- Patients with metatarsus adductus and hallux valgus often have associated deformity in the mid foot (collapse and arthritis at the tarsometatarsal joints) and hindfoot (accentuated hindfoot valgus, dorsolateral, Peritalar subluxation, etc.). These also often need to be addressed in conjunction.

VI. **Surgical Intervention**

- No single surgical intervention has proven to be superior and treating HV with MA
- Surgical algorithms have been proposed *(Sharma, Aydoga)*

- Described Alternatives
  - Include Associated Deformities when appropriate
  - Osteotomies of lesser MTs-closing wedge vs rotational
  - Re-align and fuse TMTs
  - Scarf +/-Akin
  - Lapidus
  - PMO (higher recurrence?)
  - Combinations
  - Weil
VII. Principles
- Start correction proximally with indicated
  - *Z foot likely needs double calcaneal osteotomy*
- Address 1st ray proximally
  - *Fusion with correction typically*
- Address lesser MTs proximally
  - *Rotational vs closing wedge osteotomy*
  - *TMT fusion with abduction correction*
- Toe deformities correction follows

VIII. Outcomes
- Difficult to compare giving the variability in metatarsus adductus, severity of hallux valgus, and multitude of variations in surgical therapy. Some examples below:
    - 173 patients with MA
    - Procedures: Lapidus (10), PMO (5), DMO(35)
    - HV angle 33°>17°
    - IMA 11.8>7.4
    - Recurrence 28.9%, equal among Rx groups
    - Most severe MA treated with 1-2-3 realignment TMT fusions did BEST
  - (Larholt, et al FAI 2010) Scarf and Akin
    - 38 feet followed for 59 months
    - HV correction 22°, (IM angle 14>3...)
    - 88% satisfied
  - (Loh, et al FAI 2015) Scarf alone
    - 68 patients with MA, followed for 2 years min.
    - Average HV correction
    - VAS (5>0), AOFAS (54>88) improved

IX. Summary
- Metatarsus Adductus present in 1/3 of patients with symptomatic HV
- Recurrence after surgery may be 2X higher
  - *More aggressive Rx with lesser MTs better*
- Marked MA often associated with midfoot and hindfoot deformity
- No single operation has yielded superior results
X. References


