Lesser Toe Deformities

AOFAS Resident Review Course
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Disclosure

- Nothing to disclose
Lesser Toe Deformities

- Mallet Toe
- Hammer Toe
- Claw Toe
- MTP synovitis/instability
- Metatarsalgia
Lesser Toe Deformities

- Sagittal plane deformities
- Minor irritations
  - Callus, blister
- Major disability
  - Metatarsalgia, ulceration
- One or several toes

Photos: John DiPreta, MD
Etiology

- Multiple
- Congenital, traumatic, neuromuscular, rheumatologic, mechanical
- Identical deformities may emerge regardless of the cause
- Understanding the pathologic anatomy helps determine treatment
Anatomy

- Normal function is a balance between static and dynamic stabilizers
- Static: plantar fascia, capsule, plantar plate, collaterals
- Dynamic:
  - Extrinsic M. -> EDL, FDL
  - Intrinsic M. -> FDB, EDB, interossei, lumbricals
    - Tibial N -> extrinsic flexors, intrinsics
    - Peroneal N -> extrinsic extensors
- EDL and EDB extend through extensor hood
  - EDL inserts at base of distal phalanx
  - EDL/EDB extend MTP, PIP, DIP jts
Anatomy

- FDL: deep to FDB, inserts @ base of distal phalanx
  - Flexion @ DIP
- FDB: bifurcates and inserts @ middle phalanx
  - Flexion @ PIP
- Interosseous, Lumbricals -> plantar to axis of MPJ -> flex MPJ
  - Distally pass dorsally to axis of PIP and DIP -> extension
- Deformity is a function of imbalance between these structures
Anatomy and physiology of the extensor apparatus of the toes, Sarrafian, 669-6
Definitions

- Mallet toe
  - Flexion deformity @ DIPJ
  - MTPJ, PIPJ neutral
- Hammer toe
  - Flexion deformity @ PIPJ
  - MTPJ, DIPJ neutral or minimal deformity
- Claw toe
  - Extension @ MTPJ
  - Flexion deformity of PIPJ and DIPJ
Presentation and Evaluation

- Painful callosity
- Shoe wear difficulties
- Ulceration (diabetic patient, claw toe)
- Assess for presence of 1\textsuperscript{st} ray deformity
- Determine flexibility of deformities
- Weightbearing radiographs (AP and lateral)
Management

- Non-surgical
  - Extra depth shoe wear
    - Wide toe box, soft uppers
  - Appliances
  - Metatarsal pads, toe crests, taping

- Surgical
  - Soft tissue, bony procedures, combination
  - Stepwise approach based on identification of involved static and dynamic structures
Surgery

- Manage expectations
  - Recurrence, swelling, stiffness, shoewear limitations
- Mallet toe
  - Flexible: FDL tenotomy
  - Rigid: DIPJ resection arthroplasty/arthrodesis
- Hammer toe
  - Flexible: flexor → extensor transfer
  - Rigid: PIPJ resection arthroplasty/arthrodesis, FDL
Surgery

- Claw toe
- Rigid
  - Incorporates steps for hammer toe correction
- MTP contracture
  - Soft tissue: capsular release, EDL lengthening, EDB release
  - Bony: metatarsal shortening osteotomy
2nd MTP joint pathology

- Synovitis, crossover deformity, dislocation
- Repetitive trauma
- Repetitive stress → synovitis → plantar plate insufficiency → MTP instability → continued trauma → crossover toe, dislocation
- Long 2nd metatarsal
Presentation and Evaluation

- Pain, swelling, “walking on a bunch”, “walking on a marble”
- Progressive deformity, callus under metatarsal head
- Palpable tenderness at MTPJ
- MTP drawer test
  - Dorsal translation elicits symptoms
- Standing radiographs
  - Assess position and degree of deformity
  - Widened MTP= swelling; narrow MTP= DJD or subluxation
  - Metatarsal length

Photos: John DiPreta, MD
Treatment

- **Non-surgical**
  - Offload MTPJ, decrease inflammation
    - NSAID’s, metatarsal pads, rocker bottom shoes, taping, injection

- **Surgical**
  - Synovectomy
  - Dorsal capsular release, flexor→extensor transfer, EDL lengthening, medial capsular release, lateral reefing, EDB transfer
  - Metatarsal osteotomy
Metatarsalgia

- Pain localized to forefoot
- 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th} metatarsals
- Intrinsic metatarsal pathology
  - Long metatarsal, 2\textsuperscript{nd}
- Trauma
  - Metatarsal fracture
- Iatrogenic
  - Hallux valgus surgery, lesser toe surgery
Presentation and Evaluation

- Pain localized to ball of foot
- Painful callosity
- History of trauma, prior surgery
- Hallux valgus, associated forefoot pathology
- Gastrocsoleus tightness
- Pain localized, diffuse under metatarsal heads
- Standing radiographs
  - Long metatarsal
  - Evidence of trauma or surgery
Treatment

- Non-surgical
  - Metatarsal pads
  - Orthoses

- Surgical
  - Metatarsal osteotomy
  - Associated deformities (HV)
  - Gastrocsoleus recession
Image Sources