



Flatfoot/ Posterior Tibial Deficiency w/ Dr. Geaney Notes

Anatomy & Physiology

- Flexor retinaculum tethers Posterior Tibialis
 - Distally, retinaculum tethers tendon in groove
 - Distally the retinaculum blends w/ sheath of PTT and superficial deltoid
 - Area of hypovascularity immediately distal to medial mal
 - PT tendon insertion:
 - Navicular tuberosity, inferior capsule of medial NC joint + inferior medial cuneiform
 - Second slip attaches to plantar surface of medial/lateral cuneiform and cuboid, as well as bases of corresponding metatarsals
- Posterior Tibialis function: function
 - invert mid foot and elevate medial longitudinal arch + support calc

Dysfunctional Posterior tibialis Physiology

- Medial longitudinal arch collapses, subtalar joint everts, foot abducts at TN joint, and heel assumes valgus position
- Excessive talus movement
- Valgus heel due to loss of secondary soft tissue support
 - Valgus heel>> Achilles everts calc c
 - Eventually >calc impinges against fibula> lateral ankle pain
- Clinical deformity reflects the loss of support from spring, deltoid, and TC IO ligaments

History

- Early- medial discomfort
- As progresses- maximal pain laterally as fibula presses against calc

Etiology

- 40% have HTN, obesity, DM, or previous surgery
- Also assoc w/ steroid injection
- Zone of hypovascularity 1-1.5cm distal to medial mal

Physical Exam

- Inspection: Eval for valgus position from behind
 - "Too many toes sign"- w/ inc valgus and abduction of forefoot, more of lateral toes visible from behind
- Single limb heel rise test
 - Tests PT muscle strength (resisted plantar flexion and inversion)
 - Tests subtalar motion. Achilles tendon may be lateral due to heel valgus
 - Because of weak PT- heel remains in valgus or patient unable to rise on forefoot

Radiographs

- AP: abduction of forefoot at transverse tarsal joint w/ navicular sliding laterally on talar head
- Lateral: decrease in talometatarsal angle (normal 0-10), decrease in distance of medial cuneiform from floor

Classification

- Johnson and ström - Stages of clinical dysfunction
 - Stage 1: pain and swelling medially. Some tendinitis
 - Stage 2: torn tendon, weak limb, unable to stand on tip toe
 - Present as mid foot pronates and forefoot abducts at transverse tarsal joint
 - Stage 3: severe deformity, hindfoot rigid
 - Stage 4: valgus angulation of talus and early ankle joint degeneration

Non-op treatment:

- Stage 1: Rest, anti-inflammatory medication, immobilization.
 - A removable boot may help. 6-8 weeks.
 - if better, transition to stiff soled shoe w/ medial heel and sole wedge

Operative treatment

- Tenosynovectomy
 - consider if patient shows no improvement after 6-8 weeks of care
 - open tendon sheath from myotendinous junction to insertion.
 - debride synovium and repair splits w/ 4-0 nonabsorbable sutures
- Calcaneal Osteotomy

- Addresses valgus in heel
 - lifts calc medially and alters mechanical axis of lower limb
 - Redirects gastroc-soleus group slightly medial to axis of subtalar joint
 - Secured w/ cancellous bone lag screw
- Lateral column lengthening
 - May be useful for patients w/ stage II dysfunction w/ lateral foot pain, mobile subtalar joint, and no fixed supination forefoot deformity
 - Osteotomy of calcaneus neck and putting a tricortical bone graft
 - calcaneal cuboid pain in adults
- Flexor tendon transfer
 - Stage 1 or 2 dysfunction of PT w/ weakness, valgus of hind foot, pain in medial foot, and mobile subtalar joint.
 - Most use FDL, closer to the tendon
 - Tendon is rerouted through the undersurface of navicular through a drill hole
- Arthrodesis
 - Pt w/ dysfunction PT tendon and lateral foot pain , rigid stage 3 valgus deformity of hindfoot, OR valgus deformity of hindfoot that when corrected to neutral is assoc w/ fixed forefoot supination

Sources:

Haddad, S. L., Myerson, M. S., Younger, A., Anderson, R. B., Davis, W. H., & Manoli, A. (2011). Adult acquired flatfoot deformity.