Adult Acquired Flatfoot and Posterior Tibial Tendon

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Posterior Tibial Tendon

– Adult Acquired Flat Foot

- Peri-Talar instability
- Pathology in the tendon, Spring and other ligaments
- Degenerative changes in the tendon near it's insertion on the navicular
- Myxoid degeneration

Etiology of Tendon Dysfunction

- Trauma- Direct and Indirect
- Structural- Accessory navicular
- Anatomic- Exostosis
- Inflamatory- Rheumatologic
- Neoplastic- PVNS
- Degenerative- associate with obesity, diabetes, female, overuse, hypertension

Presentation of PTTD

- Gradual onset of medial foot and ankle pain
- Swelling
- Local tenderness
- Pain or weakness in single limb toe-rise
- Deformity- acquired flat foot

Physical Examination

- Standing alignment
  - Hindfoot valgus and medial tibial translation
  - Forefoot abduction
  - Forefoot supination
- Achilles contracture
- Joint flexibility
- Hindfoot inversion on single limb toe-rise

Acquired Adult Flatfoot Deformity

TYPICAL PHYSICAL EXAMINATION

Acquired Adult Flatfoot Deformity

TYPICAL PHYSICAL EXAMINATION

- Inability to perform <u>single leg heel rise</u>
  = incompetent posterior tibial tendon

Normal Single Leg Heel Rise
Heel Rises and inverts
Opposite foot is off the ground

**Unable to Perform <u>Single</u> leg Heel Rise -Heel does Not Invert**

Classification of PTTD

- Stage 1
  - Pain and tenderness over the tendon without deformity
- Stage 2
  - Pain and tenderness, swelling, and a flexible deformity
- Stage 3- Rigid with arthrosis
- Stage 4- Add ankle involvement

Acquired Adult Flatfoot Deformity

X-Rays

- Must be WB to assess bony alignment
- AP and Lateral Foot Views
- Lateral View will show a break in Talo-1st MT line (Meary's Line)

Normal

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EMR
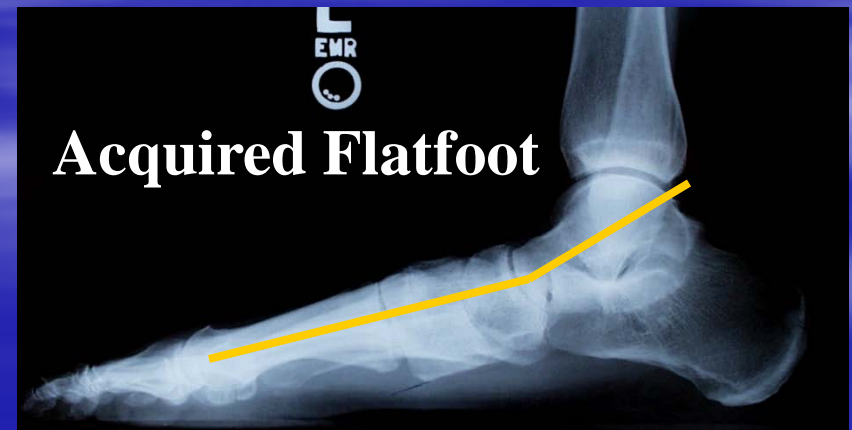
Acquired Flatfoot

Acquired Adult Flatfoot Deformity

X-Rays

- Must be WB to assess bony alignment
- AP view will show Talonavicular uncovering

Normal
< 7°

Acquired
Flatfoot
> 7°

Acquired Adult Flatfoot Deformity

Posterior Tibial Tendon Biomechanics

- PT muscle inverts subtalar joint
- Controls mobility of transverse tarsal joints
  - "Locks" the transverse tarsal joint prior to heel rise
- PT helps maintains longitudinal arch
- Loss of longitudinal arch = attenuation of:
  - PT tendon, talonavicular joint capsule, spring ligament, deltoid ligament complex
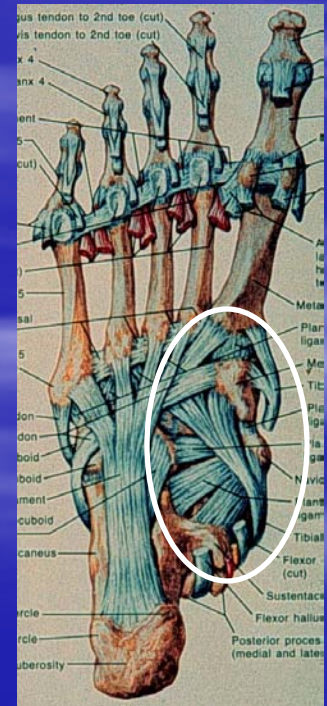
Treatment PTTD

- The primary problem is instability
  - External stabilization
    - Bracing- UCBL, Short articulated AFO, Aircast
  - Internal Stabilization
    - Surgical

Treatment PTTD

- Stage 1- Non-operative
  - NSAIDS, immobilization, ice, physical therapy
  - Treat the underlying disease
- Stage 1- Operative
  - Tenosynovectomy and repair

Treatment PTTD

- Stage 2- Non-operative
  - Orthosis and physical therapy
  - NSAIDS
  - Activity modification
- Stage 2 – Operative
  - Extra-articular stabilization
  - Fix each part of the deformity- posterior contracture, heel valgus, forefoot abduction, forefoot supination, repair of the soft tissues

Acquired Adult Flatfoot Deformity

<u>Medializing Calcaneal Osteotomy</u>

– Addresses hindfoot valgus

– Preserves hindfoot motion

– Usually combined with:

  ▪ Post Tibial tendon augme~~ntati~~ (FDL)

– Can be combined with:

  ▪ +/- Spring ligament repai~~r~~

  ▪ +/- Equinus correction

  ▪ +/- Medial column stabilization

Acquired Adult Flatfoot Deformity

"<u>All American</u>" or "<u>Around the World</u>"

- Lateral Column Lengthening
- + Medializing calcaneal osteotomy

- Addresses
  - hindfoot valgus
  - forefoot abduction
- Preserves Hindfoot Motion
- Usually combined with PT augmentation
- Can be combined with:
  - +/- Spring ligament repair
  - +/- Equinus correction

Treatment PTTD

- Stage 3- Non-operative
  - Same as stage 2
  - Orthosis
- Stage 3- Operative
  - Triple arthrodesis

Acquired Adult Flatfoot Deformity

Joint Sacrificing Procedures

- Subtalar arthrodesis
- Triple arthrodesis
  - Allows reduction of midfoot on hindfoot
  - Treatment for Stage 3 Acquired Adult Flatfoot Deformity
- Important Hindfoot motion is lost

Treatment PTTD

- Stage 4
  - Ankle instability
    - Triple arthrodesis
    - Ankle ligament reconstruction- Deltoid
  - Ankle Arthrosis
    - Pantalar arthrodesis
    - TTC fusion

Summary

- Surgical treatment should create a stable plantagrade foot
- Recovery is long
- No single procedure is applicable for all patients
- Customize the procedure to the patient