Tendon Injuries
Around the Ankle

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DISCLOSURES

• None
Clinical Question

• What does the evidence suggest for best treatment strategies for tendon injuries around the ankle?
Tendon Injuries Around the Ankle

- Achilles tendon
- Peroneal (brevis and longus)
- EDL
- EHL
- Tibialis anterior
- Posterior tibial tendon (PTT)
- FDL
- Flexor hallucis longus (FHL)
Tendons of the foot/ankle
Tendons of the foot/ankle, MRI, axial
Achilles Tendon

• Achilles Tendonitis
  – Insertional
  – Non-insertional (midsubstance)

• Achilles Tendon Rupture
  – Midsubstance
  – Calcaneal avulsion
Achilles Tendon

• Achilles Tendonitis
  – Insertional
  – Non-insertional (midsubstance)
Achilles Tendinosis

• Treatment:
  – Immobilization (boot if severe)
  – PT/Home stretching program (**eccentric exercises)
  – NSAIDS
  – Topicals
  – Modalities
  – Shock wave therapy (ESWT)
    • Mani-Babu, *AJSM*, 2014, Systematic Review
      – “Moderate Evidence to support” ESWT + PT for Achilles Tendinosis
  – Surgical debridement/tendon transfer (FHL)
Achilles Tendinosis and PRP?

- Majority of studies do NOT support the use of PRP
- Several level IV series show + benefit
- The only Level I study* shows NO DIFFERENCE vs saline
- $$$
- (May have some role with lateral epicondylitis and patellar tendon)

DiMatteo, Musculoskeletal Surg, 2015
Systematic Review
*deVos, JAMA, 2010, level I
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  - Calcaneal avulsion
    - r/o with radiograph
Achilles Tendon Rupture

- Relatively common injury in adult male athletes
- Recreational athletes, “weekend warriors”
- 4th and 5th decade
- Males ~10:1

- Typically a non-contact injury
- “Pop” and pain and cannot RTP
- Often can walk off the court/field
Achilles Rupture
Thompson Test
Achilles Rupture: Treatment Options

• Non-operative
  – Cast vs. Boot
  – NWB vs Early weight bearing
  – Immobilization vs Early functional rehab

• Operative
  – Open repair
    • Post operative casting vs. boot
    • Post operative NWB vs. Early weight bearing
    • Post operative immobilization vs Early functional rehab
  – Percutaneous repair
Achilles Rupture Treatment

• Considerations:
  – Healing rate
  – Re-rupture
  – Return to function
    • ADLs, Work
    • Sport
  – Timeframe
  – Complications
Achilles Rupture Treatment

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Figure 3. Photograph of the patient’s heel, two weeks postop showing superficial sepsis
Operative vs Non-operative

- **Historically:**
  - Non-operative treatment = short-leg cast, NWB for 4-12 weeks
    - Risk: Re-rupture (8%-21%)
  - Operative treatment = open repair, then short leg cast, NWB for 4-8 weeks
    - Re-rupture rate 2%-5%
    - Risk: Infection/wound complications (0%-5%)

Cetti *AJSM* 1993, Moller *JBJS* 2001
Early Motion after Achilles Injury

- Twaddle, *AJSM*, 2007
- RCT, Level 1
- Operative and Non-operative patients treated with early ROM after 2 wks in equinus plaster
  - Active DF to neutral, Passive (gravity) PF
- NWB for 6 wks, both groups
- 42 pts total, 1 year f/u
- Results: No difference in re-rupture rate (3 total), no difference in functional scores, no infx
Op vs Non-Op, Early WB/PT

- Willits, *JBJS* (Am), 2010
- Multicenter RCT, Level 1, 2 yr f/u
- 144 patients
- Operative vs Non operative
  - Both groups early WB (2 weeks) and early ROM [when?]  
- Re-rupture ~4.6%; no difference b/t groups  
  - Operative (2), Non Op (3)
- No clinically important difference b/t groups
- Non-op, early WB, early ROM a good option
Op vs Non-Op with early WB

- Olsson, *AJSM*, 2013  [Sweden]
- Level 1, RCT, Op vs Non-Op, 1 yr f/u
- Non-Op
  - WBAT, boot x 8 weeks
    - ***No ROM exercises for first 8 weeks!
  - 10% re-rupture rate
- Op
  - WBAT, boot x 6 weeks, gentle AROM to -15° starting wk 2
  - 0% re-rupture rate, 12% superficial infections (Abx only)

- Subjective functional scores (ATRS, PAS) same b/t groups at 12 mos
- Both groups returned to previous level of play!
- Fxnl testing (hopping, drop-CMJ) worse at 12mos in non-op group vs op
Summary Based on EBM Review

- Achilles ruptures may be treated non-operatively
- Operative treatment an option, but wound infection risk
- Re-rupture risk is diminished with early ROM and early WB in non-operative patients
- Operative and Non-operative treatment should include early WB and early ROM
- Early ROM and early WB are safe
- Regardless of treatment, a large # of athletes never return to prior level of play....
- Some MDs favor Operative treatment for high-level athletes
Peroneal Tendons

- Peroneal tendonitis
- Peroneus brevis split tear
- Subluxation/dislocation
Peroneal tendonitis

- Tx: rest, NSAIDS, CAM boot, lateral heel wedge, PT
- Surgical debridement in recalcitrant cases

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Split Peroneus Brevis

- Commonly attritional rather than acute tear
- Often seen in recalcitrant tendonitis and/or instability cases
- MRI
Split peroneus brevis
Fleck sign

- Indicative of superior retinaculum tear
- Patient at risk for subluxating peroneal tendons
- Can be an indication for surgical repair
Peroneal subluxation/dislocation

- “popping”, “catching” posterolateral ankle
- May have distant history of ankle sprain
- Seen with: Resisted DF/eversion; circumduction

- Fibular groove concavity
- May need “groove deepening” procedure
- Retinacular repair
Tibialis Anterior Ruptures

- Rare injury
- Elderly (~66yrs)
- Minimal trauma, injury may be “missed”
- Foot drop, steppage gait
- Palpable mass dorsum of ankle
Tibialis Anterior Ruptures

- Treatment
  - Conservative (AFO)
  - O.R.: direct repair vs graft supplementation
- FAOS scores favor O.R. over conservative
  - Christman-Skieller, Systematic Review, AJO, 2015
  - Overall poor quality literature
Posterior Tibial Tendon

- PTT dysfunction
- “Adult-acquired flatfoot deformity”
- Starts with medial foot/ankle pain
- Attritional tear of PTT, leading to hindfoot valgus and flatfoot deformity
- Not to be confused with “Flexible Flatfoot” deformity and accessory navicular seen in Peds
PTT Dysfunction
PTT Dysfunction: Stages

- **Stage I**
  - Tendonitis
  - Flexible foot/arch/ankle
  - Able to single heel rise

- **Stage II**
  - Flexible deformity
  - **CANNOT** do SHR

- **Stage III**
  - Fixed deformity

- **Stage IV**
  - Ankle involvement
Adult Acquired Flatfoot Deformity (PTT)

- **Stage I**
  - Non-op, boot, brace (Arizona AFO), UCBL
  - Op: tenosynovectomy

- **Stage II**
  - FDL transfer, calcaneal osteotomy, +/-TAL, LCL

- **Stage III**
  - Triple (hindfoot) fusion + TAL

- **Stage IV**
  - TTC (tibiotalocalcaneal) fusion
PTT Orthoses
PTT Dysfunction

- ***EBM review for PTT management beyond the scope of this lecture
Summary

• All tendons around the ankle can suffer from acute, chronic or attritional injuries
• R-I-C-E, boot, NSAIDS, PT successful in most cases
• Recalcitrant cases may need surgical debridement/repair/tendon transfer
• Achilles ruptures can be treated non-operatively, and this should include early ROM and early WB
• Evidence supports ESWT for at least 2nd line of treatment for tendinopathy
THANK YOU!

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