

Posterior Tibial Tendon Dysfunction

Background

1. Definition
 - Inflammation and/or overstretching of posterior tibial tendon
 - May result in flatfoot
2. General information
 - Posterior tibial tendon is a fibrous cord
 - Starts at posterior tibia, descends leg, runs behind medial malleolus, down inside of foot and into arch¹
 - Tendon is a dynamic stabilizer of medial longitudinal arch²
 - Flattening of foot results when tendon fxn is impaired
 - Most common type of flatfoot developed during adulthood - "adult-acquired flatfoot"²
 - Typically occurs in only one foot
 - May be bilateral
 - Progressive
 - Will continue to worsen w/o early Tx
 - For more information see American College of Foot and Ankle Surgeons:
 - <http://www.footphysicians.com>

Pathophysiology

1. Pathology
 - Tendinosis process causes tibialis posterior tendon to become fibrotic through repeated microtrauma (overuse)
 - Hypovascular zone in mid-portion of tendon particularly vulnerable³
 - Sx usually occur after activities that use tendon
 - Running, walking, hiking, or climbing stairs
 - More often seen in jumping sports
 - Basketball, volleyball, and running
 - Especially on turf such as soccer, football
2. Incidence/prevalence
 - Middle-aged to elderly, sedentary women²
 - Up to 10% prevalence in elderly women²
 - More prevalent in basketball, soccer and volleyball players
 - Females > males
3. Risk factors²
 - No clear etiology³
 - Pes planus
 - Hypertension
 - Obesity
 - Diabetes mellitus
 - Steroid injection around tendon
 - Seronegative arthropathies
4. Morbidity/mortality
 - Limitations w/walking
 - Flatfoot
 - Pain w/walking

Diagnostics

1. History²⁻⁴

- Stage I
 - Insidious onset of vague pain related to activity
 - Pain and swelling behind medial malleolus
 - Along posterior tibial tendon
 - Complaints of fatigue and weakness
 - Uneven shoe wear
 - Difficulty walking and standing on toes
 - No foot deformity
- Stage II
 - Complaints related to loss of fxn
 - Feeling of instability
 - Limp
 - Limited walking distance
 - Ache when walking long distances
 - Inability to walk on uneven surfaces
 - Balance problems
 - Change in shape of foot
 - Worsening of pre-existing flatfoot
 - Newly acquired flatfoot deformity
 - Incr awareness of other foot pathologies (bunions, hallux rigidus, metatarsalgia) may be reason for seeking medical attention
- Stage III and IV
 - Less medial pain and swelling
 - Possible lateral hindfoot pain secondary to impingement of fibula on sinus tarsi
 - Arthritis
- No Hx of acute trauma suggests overuse injury
- Can acutely rupture if landings are assoc w/ankle eversion, especially w/high-impact loading

2. Physical exam²⁻⁴

- Swelling of medial hindfoot
- Flattening or change in shape of foot
- Abducted forefoot
- "Too many toes" sign
 - Visible flattening of medial longitudinal arch and forefoot abduction allows examiner to see all 4 toes when looking from behind
 - Normal neutral alignment usually only 5th toe is seen
- Stage I
 - Swelling and tenderness along tendon (behind and below medial malleolus)
 - Weakness or pain w/inversion of foot
 - Possible difficulty rising on 1 heel only
 - Weakness after multiple heel raises
- Later stages
 - Less swelling and pain

- May progress to flatfoot deformity
- 3. Diagnostic testing
 - X-ray of foot and ankle
 - Determine degree of deformity
 - Confirm presence or absence of degenerative changes in subtalar and ankle articulations
 - Exclude other causes of flatfoot deformity such as
 - Congenital abnormality
 - Bone Fx or dislocation
 - Torn or stretched tendon
 - Arthritis
 - Neurologic weakness
- 4. Diagnostic criteria³
 - Clinical dx
 - Stage I: tendon intact and functioning but inflamed
 - Stage II: tendon dysfunctional, flatfoot present but passively correctable
 - Stage III: fixed deformity, degenerative changes in subtalar joint
 - Stage IV: dysfunction occurring when degenerative changes also present in ankle joint

Differential Diagnosis

1. Deltoid ligament sprain
2. Flexor digitorum longus injury
3. Flexor hallucis longus injury
4. Navicular stress Fx
5. Tarsal tunnel syndrome

Therapeutics

1. Acute Tx
 - PRICEMM (protection, relative rest, ice, compression, elevation, medications, and rehabilitative exercise modalities) (SOR:C)⁵
 - Consider immobilization in short leg cast or walking boot for 2-3 wks⁵
2. Long-term care
 - Therapy should be based on severity of dysfunction
 - Foot orthosis to decr pronation by Stage II⁵
 - Posterior tibial tendon strengthening
 - <http://www.sportsinjurybulletin.com/archive/tibialis-tendinitis.html>
 - http://www.sportspodiatry.co.uk/ankle_PTTD.htm
 - U/S therapy and eccentric exercises may help rehabilitate tendon and muscle following immobilization (SOR:B)⁵
 - NSAIDs can help reduce pain and inflammation (SOR:B)⁵
 - Transcutaneous glyceryl trinitrate patches may decr pain and improve healing in pts w/tendinopathy (SOR:C)⁵
 - Extracorporeal shock wave therapy a good Tx option for calcifying tendinopathy
 - Controversial in Tx of non-calcifying tendinopathy (SOR:C)⁵

- Ablation of neovascularization w/sclerosing agents (sclerotherapy) is promising Tx to improve tendon healing (SOR:C)⁵
- Consider surgery
 - If comprehensive, nonsurgical Tx program of 3-6 mos has failed
 - If pt is unwilling to alter his or her level of phys activity
 - If rupture of tendon evident
- Surgery involves excising abnormal tendon and releasing areas of scarring and fibrosis
 - May include repairing tendon, realigning bones of foot, or both⁵

Follow-Up

1. Refer to specialist
 - Referral to sports medicine specialist or orthopedic surgeon for greater than Stage II
2. Return to play recommendations⁶
 - Full range of ROM in injured leg compared to uninjured leg
 - Full strength of injured leg compared to uninjured leg
 - Jog straight ahead w/o pain or limping
 - Sprint straight ahead w/o pain or limping
 - Do 45° cuts, first at half-speed, then at full-speed
 - Do 20-yard figures-of-eight, first at half-speed, then at full-speed
 - Do 90° cuts, first at half-speed, then at full-speed
 - Do 10-yard figures-of-eight, first at half-speed, then at full-speed
 - Jump on both legs w/o pain and can jump on injured leg w/o pain

Prognosis

1. Chronic and progressive
2. May require several attempts Tx

Patient Education

1. American Orthopaedic Foot and Ankle Society: <http://www.footcaremd.com>
2. British Orthopaedic Foot Surgery Society: <http://www.bofas.org.uk>

References

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