

Ankle Pain

For information on all types of injuries visit:
<http://www.cssphysio.com.au/Doctors/fordocors.html>



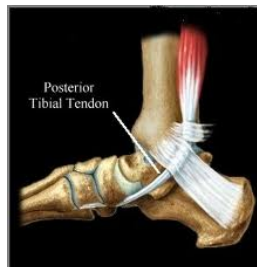
Tibialis Posterior Dysfunction

The American Journal of Sports Medicine has done an excellent series of articles on tendon disorders of the foot and ankle. In the October 2010 issue, is an article devoted to disorders of the tibialis posterior tendon. This is summarised below.



Tibialis posterior (TP) is the most central muscle in the lower leg. The tendon forms in the lower 1/3 of the leg & passes in a groove immediately posterior to the medial malleolus, where it changes direction to run relatively

anteriorly & laterally. At this point there is a region of relative hypovascularity just distal to the malleolus. It is held in the groove by the flexor retinaculum. The TP tendon, retinaculum & superficial deltoid ligament are all closely related. The tendon divides anterior to the navicular tuberosity, and connects widely to the navicular, all three cuneiforms, the cuboid & the bases of the corresponding metatarsals. TP is an important dynamic stabiliser of the medial longitudinal arch, and the most powerful inverter of the foot.



There is a well known deformity related to the TP, that is associated with excessive subtalar pronation. Progression of the syndrome involves loss of support from the spring, deltoid & talocalcaneal interosseous ligaments, the talonavicular capsule & the plantar fascia. In time the deltoid ligament

becomes attenuated & the talus begins to tilt in the ankle joint, resulting in hindfoot valgus. With the associated ligament damage, the deformity eventually becomes fixed.

Acute traumatic injuries (typically due to ankle fracture &/or dislocation) can result in partial & full-thickness tears. Dislocation of the tendon due to flexor retinacular tear, is an uncommon but recognised injury. The mechanism is forced dorsiflexion & eversion of the ankle on an inverted foot.

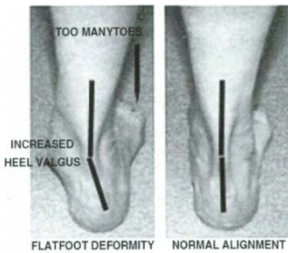
Another cause of symptoms arising from the TP tendon is the presence of an accessory navicular bone. This can be unilateral or bilateral, and is more common in females. Symptoms usually arise after 5 years of age & are most common in early adolescence. Symptoms can also arise acutely in adulthood, particularly after an inversion injury. In children the complaint is often chronic, & relates to pressure on the medial prominence from the shoe. Conservative treatment includes non-steroidal medication & orthotics or bracing. However success is limited, & surgical removal of the accessory bone is often required.

The most commonly seen TP dysfunction is tendon deficiency with acquired flatfoot deformity. It is a very common clinical entity, the incidence of which it is difficult to determine. There is general agreement that the risk is higher in middle-aged females with coexisting obesity. Other related factors include diabetes mellitus, hypertension, steroid exposure, or previous trauma or surgery to the medial foot region.

The diagnosis, particularly in the early stages, is a clinical one. There will be posteromedial ankle pain, worse on activity, and often radiating into the arch. The patient will often complain of a sensation of fatigue in the foot, and difficulty walking on uneven surfaces. There may be swelling & pain along the course of the tendon. Later, as the deformity progresses & lateral impingement occurs, they may complain of lateral ankle pain.



Examination: Observation from behind the patient may reveal a pes plano-valgus deformity, or “too many toes sign” (see diagram).



Heel valgus will also be noted, as being greater than the normal 5° to 10° range. Test single leg heel-raise, & / or have the patient walk on their toes. They should be able to perform at

least 5-10 raises without difficulty. Palpate the TP tendon for swelling & pain, and palpate over the tip of the lateral malleolus for lateral impingement. Test the patients combined plantar flexion / inversion strength against resistance.

Stages on the disease: The literature describes 3 to 4 stages of the TP disease process:

Stage 1: There is tenderness over the TP tendon, possible oedema, mild weakness, but normal overall alignment & mobility.

Treatment generally involves orthotic support, & ankle strength & flexibility exercises. In acute or severe cases temporary immobilisation in a walking boot is recommended. Occasionally, operative management is recommended, usually in the form of a tenosynovectomy, with possible debridement & / or repair of degenerative or torn areas of the tendon.

Stage 2: Characterised by the presence of a flexible pes planus deformity, with varying degree of heel valgus & positive ‘too-many-toes sign’. There is tenderness & swelling, and increasing weakness & difficulty with single-limb heel raises. This stage can be further subdivided into Stage 2A – no lateral ankle pain, & 2B – the presence of lateral ankle pain, indicating lateral impingement due to collapse of the medial arch.

Bilateral weightbearing AP & lateral XRays are useful to evaluate for arthrosis & deformity, including increased talar tilt & sub-fibular impingement. MRI is useful for assessing for tendon tearing, degeneration, oedema & thickening, & for gross tears of the spring ligament complex.

Treat as as for stage 1, however orthotics will need to be more rigid. Operative treatment is controversial, but may include a tendon transfer (usually flexor digitorum longus) to replace or augment the TP tendon, along with bony procedures to improve static alignment - usually a medialising calcaneal osteotomy. Spring ligament repair may also be performed.

Stage 3: There is loss of flexibility of the deformity, and increasing lateral ankle pain. Forefoot supination may be present to compensate for the hindfoot valgus, in order to maintain a plantargrade foot. Degenerative changes of the subtalar, talonavicular & calcaneocuboid joints may be present.

Orthotic therapy or bracing is applied to prevent progressive deformity. Surgery is considered if the patient does not obtain relief within 3 to 6 months. Single, double & triple joint fusions have been used in this stage, to the subtalar, talonavicular, talonavicular & / or calcaneocuboid joints. Lengthening of the Achilles tendon may be performed to increase ankle dorsiflexion & decrease midfoot loading. Unfortunately there is a high rate of post-operative complications, & some patients will still develop ankle arthrosis.

Stage 4: Untreated stage 3 progresses to this stage, which is characterised by the presence of ankle arthritis. There is also a high incidence of fibular stress fractures & lateral talar dome osteonecrosis. Surgical options are more likely to include arthrodesis or arthroplasty.

Reference: Gluck, G et al (2010) Tendon disorders of the foot and ankle, part 3: The posterior tibial tendon. *The American Journal of Sports Medicine*, 38, 10, 2133-2144.

Case History:

‘Vanessa’ is a 31 year-old mother of three, who came to see me regarding a one month history of right anterior hip / groin pain. The pain was aggravated by sitting, particularly in low seats, and by over-striding when walking. During the past week, the pain was waking her at night.

On examination:

1. Sagittal posture revealed hyperextension of both knees, and a moderate sway back posture (example, photo 1).
2. Looking from behind, the most notable finding was reduced right calf girth, and rearfoot valgus. She displayed the classic “too many toes” sign, an indication of tibialis posterior (TP) deficiency or rupture (see photo 2).
3. The hip joint had full pain-free range of motion, apart from full extension which produced mild discomfort. On palpation she was tender over the region of the pectineus origin, and over the psoas tendon. The short hip adductors had moderately increased tone.
4. Lumbar spine and neurological tests were all normal.
5. Single leg squat revealed poor control on the right. However the stability at the hip was good. It was the ankle that lacked of control.



Vanessa had no significant history of right foot / ankle pain or injury, and had no prior lumbar spine dysfunction.

Impression:

The sway back posture results in hyperextension at the hips. This has potential to place tension on the anterior hip joint capsule, iliofemoral ligaments, and the iliopsoas tendon (which crosses and supports the anterior joint). Pectineus is a hip flexor as well as adductor, so may be tonically active to resist passive hip extension. Prolonged sway back posture also means her posterior hip musculature is tight, and causing anterior shear at the hip joint. When she sits, the normal posterior glide of the femur is lacking, so anterior impingement occurs.

The hip pain is generated by local postural factors, but there may be a contribution from the distal TP insufficiency. The loss of ankle control requires greater activation of the hip and thigh muscles, to compensate for loss of balance.

Management:

1. Manual therapy: the local hip problem was treated with anterior to posterior glides, and posterior releases, to stretch the posterior soft-tissues. Adductor releases were

performed to reduce stress on the origin of pectineus.

2. Posture. Vanessa was taught strategies to correct her sway back posture. What was interesting, was that without any attention to the ankle, sway back correction brought her calcaneus back into neutral, and gave her correct distal alignment (photo 3). I wasn't expecting this. A study in 2011 did identify poor hip control as a factor in TP dysfunction (Kulig et al). In Vanessa's case, the problem is still a functional one, as it is correctable.
3. Core training along with her postural correction, to assist longer-term maintenance.
4. Orthotics. This is the recommended therapy for symptomatic TP dysfunction, and this may be part of her management in the short or longer term, depending on how her symptoms progress.



Vanessa's hip pain settled after two treatments, and she is continuing to work on correcting her standing posture.

References:

1. Gluck, G et al (2010). Tendon disorders of the foot and ankle part 3: posterior tibial tendon. AJSM, 38, 10, 2133-2144.
2. Kulig, K et al (2011) Women with posterior tibial tendon dysfunction have diminished ankle and hip muscle performance. JOSPT, 41, 9, 687-694.

Please contact us if you would like a printable copy of this document.

For information for doctors on physiotherapy management of all types of injuries visit:
<http://www.cssphysio.com.au/Doctors/fordoctors.html>

Information for patients is at:
<http://www.cssphysio.com.au/forpatients.html>



Concord Sport & Spine Physiotherapy
202 Concord Road
Concord West, NSW 2138
Sydney, Australia.

Ph (02) 9736 1092

Email: info@cssphysio.com.au

Web: www.cssphysio.com.au

Copyright © 2012 Paul Monaro. All Rights Reserved