

# POSTERIOR TIBIAL TENDON DYSFUNCTION

## WHAT'S THE PROBLEM?

Tendonitis in the foot is a common problem because we use our feet continuously. It is a common example of an overuse injury. One of the most frequently affected tendons is the posterior tibial tendon, a structure that is normally hard at work, helping to hold the arch up and prevent over-pronation or rolling in of the foot.

## ANATOMY

The posterior tibial tendon runs behind the inside bump on the ankle (the medial malleolus), across the instep, and attaches to the bottom of the foot.

## WHAT'S THE PROBLEM?

Posterior tibial tendon dysfunction actually runs the gamut from initial strain and minor degeneration of the posterior tibial tendon to frank rupture. It is now known that the problem is caused by a degenerative tendinosis rather than inflammation. Inflammation when it does occur, is secondary.

## HOW DOES IT FEEL?

The symptoms of tendonitis of the posterior tibial tendon include pain in the instep area of the foot and swelling along the course of the tendon. The patient may also experience pain and swelling right behind the inner ankle bone. There is pain upon palpation along the course of the posterior tibial tendon behind the inner ankle. There may also be burning, shooting, tingling, stabbing pain, because the nerve is inflamed inside the tarsal tunnel. Patients experience significant pain when walking, steadily worsening toward the end of the day. There is significant pain when the patient inverts his/her foot, as well as pain upon passive stretching of the posterior tibial tendon, and on eversion or flattening of the foot. In some cases the tendon may actually rupture or tear, due to weakening of the tendon by the inflammatory process. Rupture of the tendon leads to a fairly pronounced flatfoot deformity that is easily recognizable.



## LET'S DO A TEST!

The patient is viewed standing from behind. The amount of heel valgus on the affected side is noted. The patient is then asked to stand on their toes. The heel should invert upon standing in the normal foot without posterior tibial tendon dysfunction.

A very popular test for posterior tibial tendon dysfunction is the single heel rise. The patient is asked to stand on his toes standing on one foot. They will not be able to perform this maneuver and if they are, there will be significant pain upon single heel rise. If the patient is able to do the test, they are asked to repeat it and will soon start feeling intense pain if a tendonitis is present.

In some difficult cases, an MRI scan may be useful to determine whether the tendon has ruptured.

## HOW DID THIS HAPPEN?

Behind the medial malleolus, the ankle bone on the side of the ankle facing the other foot, there is a concavity which is called the medial retromalleolar sulcus. Within this groove runs the tendon of the posterior tibial muscle. The groove and the fibrous covering which envelopes it, is known as the Tarsal Tunnel. The section of the tendon where it passes through the tunnel is a relatively hypovascular area, where this tendon becomes strained and degeneration develops. If activity and injury continues, the problem increases and the tendon begins to degenerate.

Problems with the posterior tibial tendon seem to occur in stages. Initially, irritation of the outer covering of the tendon called the paratendon causes a paratendonitis. This simply indicates that there is inflammation around the tendon as it runs through the tarsal tunnel. As we age, the tendon is subject to degeneration within the substance of the tendon. This creates a situation where the tendon becomes thickened, sometimes to the extent that a nodule forms within the tendon. The normal arrangement of the fibers of the tendon (similar to a nylon rope) becomes jumbled, and the tendon loses strength. This condition is called tendonosis.

In many cases, the two conditions are present simultaneously. The weakened, degenerative tendon sets the stage for the possibility of actual rupture (above, left) of the posterior tibial tendon. Flat foot types, with equinus influences (tight heel cords, pronation during late stance, too low a heel and inadequate support in footwear are factors which can lead to Posterior Tibial Tendon Dysfunction. Walking up and down hills (golf course) hyperpronating and supinating activities (golf swing) can bring on symptoms.

#### **WHAT CAN I DO FOR IT?**

When the foot is acutely painful, rest, ice, non-steroidal anti-inflammatory drugs (NSAID's) like Voltaren are recommended, and a compressive dressing may be applied.

#### **WHAT WILL MY PODIATRIST DO FOR IT?**

Cast immobilization holding the foot in slight inversion and plantarflexion for 4-6 weeks may be started. After the acute period, a custom orthosis or brace may be fitted. An air stirrup brace or lace-up ankle support is beneficial during the rehabilitation period. Your podiatrist may prescribe special shoes with external additions to the medial side (i.e. medial heel wedge), to support the foot and prevent arch collapse. The podiatrist may prescribe a custom foot orthotic based on the flexibility of the foot. The orthosis may be constructed of leather or plastic. An orthosis with a rearfoot varus post is sometimes used for posterior tibial

dysfunction as the foot begins to change shape and flatten. If the foot becomes both flat and rigid, an Ankle-foot orthosis may become necessary. If the condition becomes severe and chronic, the podiatrist may refer you for a surgical intervention, which consists of tendon transfers and osteotomies to improve function, and parts of the thickened tendon may be removed, to decrease symptoms.

If the tendon has ruptured, surgery may be required to either repair the ruptured tendon - or to replace it with a tendon graft. Most tears will not simply be repairable, unless they only recently occurred. Usually, another tendon in the foot, such as the tendon that flexes the four lesser toes (bends them down) is used as a tendon graft to replace the function of the posterior tibial tendon.

Finally, in cases which have been neglected, and a fixed flatfoot deformity is present, a fusion (or arthrodesis) of the foot may be required. A fusion is an operation where a joint between two bones is removed and the two bones on either side of the joint are allowed to grow together - or fuse. This type of operation is used to stop pain from joints that are worn out and can be used to realign the bones when the normal mechanisms for maintaining normal alignment are deficient - such as when the tendons and ligaments no longer work properly. Usually, several joints must be fused to control the flatfoot deformity occurring after posterior tibial tendon rupture.

Following surgery, you will most likely be placed in some sort of brace or cast if the tendon has been repaired or grafted. You will probably be in a cast for 6-8 weeks if a fusion has been performed.