

FOOT PAIN

Two of the most common sources of foot pain seen in a doctor's office are **Heel Spurs** and **Plantar Fasciitis**. These two conditions are closely related and are actually different manifestations of the same process.



Plantar fasciitis is caused by inflammation of the tendon that attaches to the bottom of the foot that connects the ball of the foot to the heel. This tendon is partially responsible for maintaining the normal shape of the arch like a string maintains the shape of a bow. Inflammation of the tendon is usually caused by excess tension on the tendon due to unsupportive shoes, excessive standing or walking on hard surfaces. Excess tension can be worsened by weak ligaments and muscles in the arches, abnormally tight ankle joints, calf muscles that are too tight and excess weight.



Inflammation can occur anywhere along the length of the plantar fascia. If the inflammation occurs where the plantar fascia attaches to the heel bone (calcaneus) it can eventually cause a "heel spur" to form. A heel spur is an extension of bone that grows off of the heel bone where the tendon attaches in response to excess tension. However, the spur itself, without inflammation of the tendon, is less often a cause of pain unless it is very large and/or the individual has a very thin layer of soft tissue (heel pad) covering the spur.

Temporary relief from heel pain, whether caused by heel spur or plantar fasciitis, can sometimes be obtained by protecting the heel with a device known as a "heel cup". This is a pad that is worn in the shoe that has an area cut out or an area with soft gel under the heel so that the spur is not carrying as much body weight.



Permanent relief from the pain of plantar fasciitis or heel spurs requires corrections of the factors that cause the tendon to be stressed.

Correcting the causes of plantar fasciitis and heel pain

Weak Arches cause tension on the tendon by allowing the foot to lengthen excessively when you stand. Weak arches can be supported with arch supports. Most of the time, a good pair of shoes or inexpensive over-the-counter arch supports will be sufficient to do the job. Sometimes an individual may have hard to fit feet or an exceptionally stubborn condition and custom made arch supports, or orthotics, will need to be made.

In very acute situations it is important that the arch be supported anytime the individual is weight bearing (standing) for at least 6 weeks and preferably 16 weeks to give the tendon a chance to heal. No barefoot walking at any time, except showering. That means when you get out of bed your shoes must be there so that you can put them on before your feet hit the floor. This prevents the arch from flattening and pulling on the tendon. Once the tendon has healed and the pain subsides you can be a little less consistent with the support.



There are many styles of orthotics or arch support available over the counter, on-line or custom made.

Other devices, strapping or taping of the arch are sometimes used when the in-shoe style of arch supports cannot be used due to the type of shoe or some other factor.



Exercises can help strengthen the foot muscles that support the arch. The easiest exercise is simply to practice picking things up with your toes. Make it a part of your daily routine to use your toes when you pick up clothes, towels and other items that always seem to be on the floor. Make this a part of your housekeeping practice. Use one foot and then the other. It may seem like you are being lazy by not bending over to pick things up but in fact you are making your arches stronger and helping to protect your back. An added benefit is that it helps improve your balance, like doing tai chi, and will help prevent dangerous falls when you are older.

Tight calf muscles must be stretched diligently. Look at the picture below.

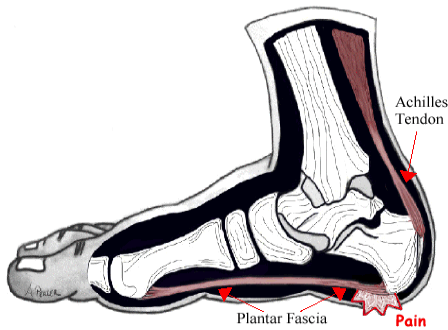
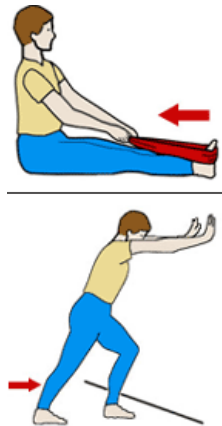


Figure 1: Plantar fascia extends from the heel bone to the ball of the foot. The Achilles tendon also inserts in the heel bone (behind the leg).

You can see that the calf muscles attach to the top of the heel bone while the plantar fascia attaches to the bottom of the heel bone. They work as a unit to balance forces on the heel bone. But if the calf muscle is too tight it causes a rotation of the heel bone that puts more strain on the plantar fascia.

All muscles are best stretched when they are warm so stretch them after you have been up for a while, at bed time or after exercising, especially if you have been exercising your legs by either walking, running, stair climbing, elliptical machine or strength training. The stretches should be held for at least 10 seconds and repeated three times. Below are some variations on calf stretches. Do whichever one feels best to you or switch off and do a different one from time to time.



Occasionally these stretches are not enough. If you have had chronically tight calf muscles for years you may have to wear a night splint like the one shown below for a few weeks to get the calf to stretch adequately.



The goal of stretching is to lengthen the calf muscles. You can tell if you are successful by noting the angle that the foot makes with the leg. When standing with the ball of your foot on a step and letting your heel drop off you should be able to let your heel drop several inches creating an angle of less than 90 degrees between the foot and the leg. See the picture above, this shows fairly good flexibility in the ankle. Both heels should be able to drop approximately the same distance. If you cannot drop the heel down very far or if one foot drops significantly less than the other after several weeks of stretching, then you may have a restriction in the joints of the ankle.

Tight ankle joints can be loosened by doing 10 repetitions of each of these two exercises before getting out of bed each morning and after rising from a chair if you have been sitting for an hour or more.



If these exercises do not result in better ankle flexion after a few weeks then professional treatment with manipulation or mobilization will probably be helpful to restore normal movement of the ankle joints.

Other considerations:

During periods of acute pain anti-inflammatory medication like aspirin or ibuprophen can reduce swelling and pain temporarily. Prescription anti-inflammatory medications, steroids and steroid injections are sometimes used in difficult cases. Surgical removal of the spur is rarely done any more because it is a fairly invasive procedure, the results were not always that good and because good conservative care almost always resolves the condition.

Occasionally other procedures like deep tissue massage, ultrasound and interferential therapy will help speed up the recovery. With proper conservative treatment you should be pain free in a few weeks. Long term adherence to the procedures described above will prevent a return of the symptoms. Ask the doctor or therapist if you have any questions. This paper does not replace the advice of a health care professional, is not designed to diagnose or treat any condition and is for informational purposes only.