

Plantar Fasciitis

Plantar fasciitis is the most common painful condition of the heel, and a common cause of foot pain. It often occurs in athletes including runners and walkers, but can occur in sedentary individuals as well. The condition is named for inflammation (“-itis”) of the plantar fascia which is a fibrous membrane of connective tissue (“fascia”) on the bottom of the foot. However, this is no longer considered an inflammatory condition, but rather involves degeneration of the connective tissue. The fascia is attached from the heel bone on the bottom of the foot and continues along the whole length of the foot to the undersides of the toes (see Figure 1). It helps to support the arch at the instep of the foot especially in walking and running when the toes are extended (see figure 1).

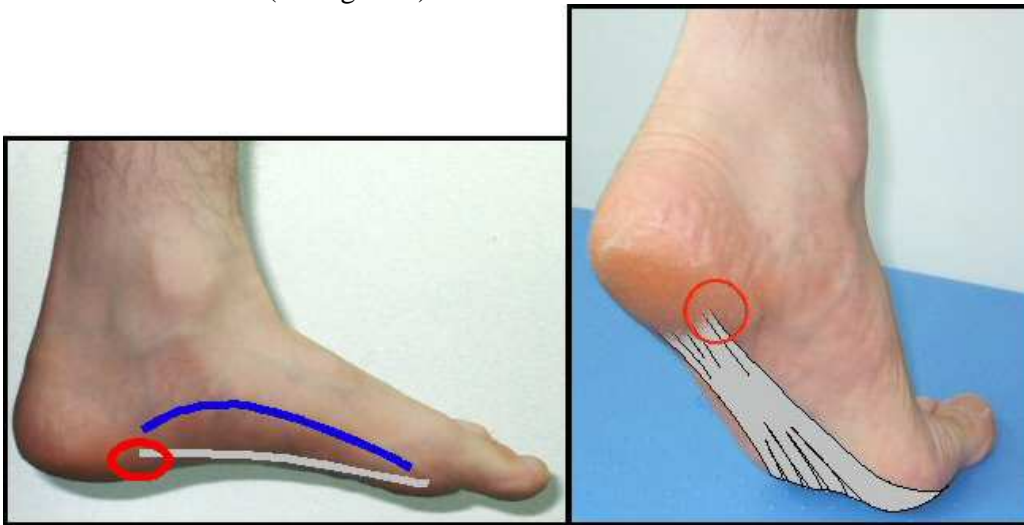


Figure 1. The plantar fascia and medial arch of the foot: The grey represents the plantar fascia, which is a tough sheet of connective tissue along the bottom of the foot. Without any weight on the foot, there is a longitudinal arch (blue line) formed by the bones of the foot. When the toes extend (as in the right picture) the pull along the fascia shortens the arch. The red indicates the typical location for plantar fasciitis pain.

How does plantar fasciitis occur?

Despite the commonality of this condition the cause is still largely unknown. Some authorities consider it analogous to shin splints but rather in the heel where the fascia ends up pulling and pulling at the site where it attaches to the heel bone. However, there are a number of conditions associated with plantar fasciitis including diabetes, Paget’s disease and arthritis. Additionally, there are a number of factors that are commonly seen with plantar fasciitis in otherwise healthy people. These include a medial arch that is excessively high, called “pes cavus”, or low which is called “pes planus” or as seen with excessive “pronation” of the foot. Pronation of the foot refers to an alignment where the arch lowers and rolls inward as the front of the foot angles out towards the side (see figure 2). High arched feet have diminished ability to absorb the impact of walking/running which is thought to increase the risk of injuries. Conversely low-arched feet (overpronated) allow more stretching of the fascia and therefore pulling at the attachment site on the heel. As high arches tend to be less common than feet with a low arch, high arches are seen less commonly as a cause of plantar fasciitis.

Other factors associated with plantar fasciitis are: having one leg shorter than the other, having old shoes or shoes with inadequate support, overtraining or sudden increase in amount of exercise, tightness in certain muscle groups, and being overweight.

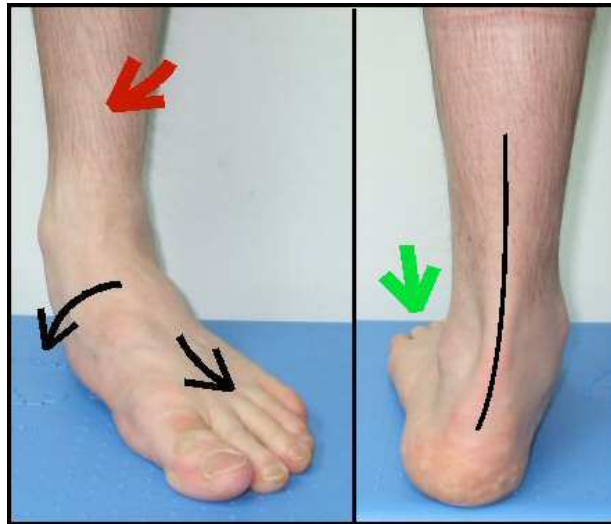


Figure 2. Overpronation of the foot: With weight on the foot, the alignment can change to overpronation. In this extreme example the arch has collapsed while the front of the foot points laterally (black arrows). This results in the leg lowering with slight rotation inwards (red arrow). From behind more of the toes are visible (green arrow) and the Achilles' tendon bends inward (black line).

What are the symptoms of plantar fasciitis?

Usually the pain is felt at the bottom of the heel on the medial side where the fascia attaches to the heel bone (see figure 1), or to a lesser extent in the medial arch of the foot. The classic presentation is sharp pain in at the bottom of the heel during the first few steps in the morning or after the foot has been resting for a while. This pain soon starts to lessen as the person walks around, but returns later after sitting or sleep. Generally speaking there is no numbness or weakness.

Research indicates that risk factors for prolonged chronic symptoms include: waiting a prolonged period before seeking treatment, having plantar fasciitis on both sides, and being overweight.

How is plantar fasciitis examined and diagnosed?

Diagnosis is generally straightforward, but an examination must be done to rule out other possible causes of foot/heel pain (which would require different treatment) such as fracture, bursitis, and nerve entrapments that mimic plantar fasciitis. Diagnosis is based on the description of the pain and examination which should not only include the area of pain but also the biomechanics of the feet and legs. Furthermore, other factors should be explored, such as, training/exercise program, footwear, body weight, previous injuries, walking/running gait, etc.

Are special tests (like X-rays or MRI) needed?

No. The diagnosis is made based on the presentation of the symptoms and special diagnostic tests are rarely indicated. X-rays do not show the plantar fascia. With x-rays often times heel spurs (a small growth of bone) is seen in the heel with plantar fasciitis but these are generally not the cause of pain and of minimal importance to plantar fasciitis. Ultrasound imaging or magnetic resonance imaging (MRI) may show thickening of the fascia, which support the diagnosis, however, such findings do not change treatment and therefore probably not the prognosis either.

How is plantar fasciitis treated?

Conservative (non-surgical) treatment including rehabilitation and home care is successful in 90% of patients. Surgery should only be considered after 6-12 months of treatment without

success. For many people ultrasound with stretching and exercises will go a long way to resolve the problem. Treatment should address any biomechanical abnormalities of the leg or foot (excessively low or high arch) and may include arch supports, changing to a more supportive pair of shoes, and/or possibly using splints at night to prevent shortening of muscles and connective tissue. Finally, the lifestyle and exercise program of the individual should be modified to allow the person to heal but still get sufficient training and help to maintain a healthy weight.

Other therapies include injection of steroids into the foot. This can help to relieve the pain but does not correct any of the contributing factors. So if an injection is used, it needs to be a part of the treatment strategies described above. Another treatment developed for plantar fasciitis is called extracorporeal shock wave treatment (ESWT). This uses pulses of sound waves to reduce pain and stimulate healing and is the same technology that is sometimes used for kidney stones. The effectiveness of this treatment, though, is still controversial. Multiple studies, including a large multi-centre study, concluded that ESWT was ineffective for chronic plantar fasciitis (Haake M et al. BMJ 2003; Bushbinder R, JAMA 2002). More research may be needed to determine the effectiveness.

In summary, plantar fasciitis is a common injury that affects both athletes and sedentary individuals. Despite its prevalence the exact cause is not fully known, but treatment should be comprehensive targeting contributing factors with in-office treatment and self management without undue delay. Research shows that by following these steps the long term prognosis is favorable in about 90% of cases.

References

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Disclaimer: The information is provided for general knowledge only. As each person is different and other conditions cause heel pain, this information may not apply to you. If you are seeking information, advice or treatment please contact the clinic for an appointment.