

Heel Pain: Plantar Fasciitis and Heel Spur

The plantar fascia is the strong tissue under the foot that connects the toes to the heel. In conjunction with the muscles and bones, it forms the arch of the foot.

Diagnosis

Plantar fasciitis is an overuse injury at the point where the plantar fascia anteromedial attaches to the heel (*figure 1*). Degenerative changes of the plantar fascia occur at the attachment site to the bone, as a result of repetitive micro ruptures. A heel spur is calcification caused by repeated pulling away of the periosteum from the calcaneus. This can be demonstrated by X-rays. However, heel spur itself is not the cause of the pain. Plantar fasciitis is common among players who perform a great deal of jumping and sprinting. Common symptoms are a localised, sharp pain and/or swelling at the inside of the heel, deep under the fat pad of the calcaneus, as well as pain during exercise. Rest gives immediate pain relief, although there may be some nagging pain after exercises or at night. There is generally pain and stiffness in the morning and at the start of exercise, when the area around the heel is cold and contracted.

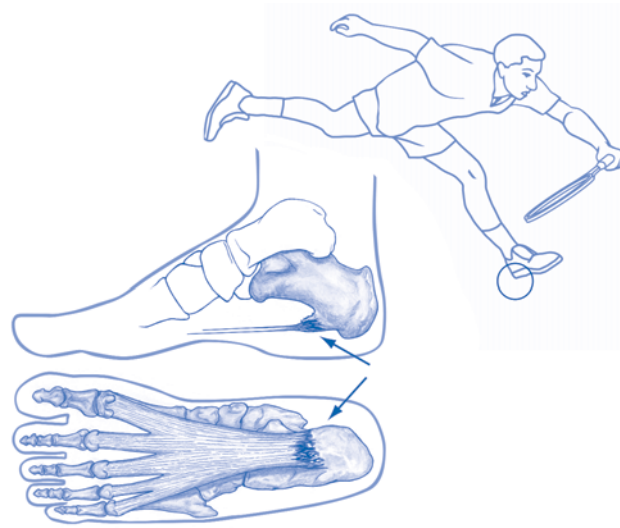


Figure 1. Heel pain: plantar fasciitis and heel spur

First Aid

Fast and adequate first aid treatment is very important to ensure a speedy recovery. In serious cases or when in doubt, the injury should be evaluated by a physician. He/she may refer the patient to a physiotherapist for further treatment.

- The following general measures can be taken to ease the pain: activity modification, unloaded exercise, cooling with ice, stretching and wearing firm, well-cushioned, orthotically-designed, shoes.
- When there is pain and swelling, ice massage can be helpful. Use a melting ice cube or a polystyrene cup filled with ice. Massage the painful spot. Five to eight minutes of massage will generally be sufficient. Repeat this several times a day.
- Massaging the soles of the feet by rolling the feet over a can or bottle will also help to relax the fascia and the muscles.
- In feet with a collapsed arch (flat feet) or excessive pronation, the plantar fascia may become overloaded during running and tennis. When the plantar fascia is very tight, as in cavus feet, there may also be considerable pressure at the attachment to the heel bone. Make sure the feet receive adequate support by using an inlay, shoes with sturdy soles or tape.
- Temporary use of a shock absorbing heel lift can be useful. The advantage of a heel lift is that there is less tension on the plantar fascia, because the calf muscles are more relaxed.

How to Ensure the Best Recovery

When the initial pain and swelling have disappeared, the player can start to build up the volume and/or intensity of training. However, the onset of pain during this period is a signal to take some rest. If players go beyond their pain threshold, this is likely to slow the healing process.

Training load should be increased in three stages, as follows:

Stage 1. Improvement of Normal Function

- Stretching the foot muscles. Kneel on one knee, with the toes on the floor (*figure 2*). A stronger stretch can be felt by grabbing the toes of the foot with one hand and pulling the toes and feet as far backwards as possible (*figure 3*).
- Stretching of the long calf muscle. Take one step forward with the uninjured leg. The knee of the injured leg is kept straight. Shift the weight of the back leg to the front leg and press the heel of the back leg firmly into the floor. Rest with the hands on a stationary object (no bouncing). The stretch is felt high in the calf. Hold the stretch for 15 to 20 seconds and follow this with a rest period of 10 to 20 seconds. Repeat three times.

- Stretching the short calf muscles. Start from the same position as described above, but now bend the knee of the back leg, while keeping the heel on the floor. The stretch is felt low in the calf. Hold the stretch for 15 to 20 seconds, then rest for 10 to 20 seconds. Repeat three times.
- Strengthening the foot muscles. Sit on a chair. Write the alphabet in the air with the injured foot. Fold a towel by grasping it with the toes of the injured leg. Perform this for 15 to 20 seconds, then rest for 10 to 20 seconds. Repeat 10 to 20 times.
- A night splint with the ankle in a neutral position and the toes maximally bent backwards/upwards reduces the healing time. The night splint is applied with an elastic band.
- Cycling or swimming for 15 to 30 minutes every day preserves general fitness.

Stage 2. Build-up

As soon as the player can perform the above exercises well and can walk without pain, he/she can start building up strength for a return to tennis.

- Slowly rise to your toes and hold for 10 to 20 seconds, then return to the starting position. First perform the exercise with both feet at the same time, then with the injured leg only.
- Walk on your toes, then on your heels.
- Take small, quick steps on the spot, alternating the left and the right leg.
- If this goes well, introduce easy jogging. Take small steps and use the entire foot.
- This can be followed by some easy running.
- The next step is to include sprinting exercises, starts, stops and turns in the training.
- Jumping exercises are the final step in the build-up stage.

Stage 3. Return to Play

- A return to the tennis court should now be possible. Start against the practice wall or with mini-tennis and gradually increase the distance to the wall, or use a full court. Make sure you position yourself well for the ball by taking small steps.
- A start can now be made with volleys.
- In the course of the next two weeks, gradually incorporate exercises that require running longer distances to the ball (tennis drills from side to side).
- Next, include low volleys and overheads.
- Start playing points, then games, and then a full practice match. Once practice matches have been completed for two successive weeks without problems, the player is ready for serious tournament play.



Figure 2. Stretching the foot muscles



Figure 3. Stretching the foot muscles slightly further

Preventing Re-injury

It is not always possible to prevent the recurrence of an injury to the heel, but the risk can be reduced by paying attention to the following:

- Perform a complete warm-up before play and cool down afterwards, for approximately 10 to 15 minutes each.
- Use correct form when stretching. Stretching exercises for the foot and calf muscles are of particular importance.
- Ensure a gradual build-up of the training programme, so that the body can slowly adapt to the extra training load. Many players suffer injuries when they switch from a clay court to a hard court or during the transition from outdoor to indoor play. After a holiday, illness or when practising on a hard court, gradually increase the training load over the course of one to two weeks.
- Wear well-fitting tennis shoes with a firm heel cap and adequate arch support.
- Use proper shoes during off-court (conditioning) training. In casual settings, firm walking shoes are more comfortable than unstable, light shoes or high heels. A sudden decrease in heel height can increase the potential for heel injury if a player's tendons and muscles lack flexibility.
- Do not throw out old shoes immediately. Break in new shoes gradually and walk around in them for a day or two first, to help 'wear them in'.
- Improve the co-ordination (proprioception) and strength of the muscles around the ankle. Performing exercises on one leg is an effective way to do this. Additional complexity (difficulty) can be added to these exercises if the player stands on a wobble board.