

Plantar Fasciopathy

Approximately 50% of Americans will experience heel pain at some point in their lifetime. The most common form of heel pain is related to the plantar fascia. The plantar fascia is a thick sheet of connective tissue (technically a ligament) that runs along the bottom of the foot from the heel to the base of each of the five toes. It supports the longitudinal arch of the foot, helps to absorb shock and stabilizes the metatarsal bones during footstrike. This means that stress is placed on the plantar fascia every time you stand, walk or run. Any irritation of the plantar may take a prolonged amount of time to resolve because of the perpetuating stress of everyday activities. Furthermore, the plantar does not receive a significant amount of blood flow which also slows the healing process.

The pain itself is generally localized at the inside base of the heel and may extend down the inside arch of the foot toward the big toe. It is usually more irritated for the first few minutes in the morning or when getting up after sitting for a long period of time. Standing or walking for extended periods may also aggravate the pain. It is usually more uncomfortable to stand barefoot or on hard surfaces.

It is important to realize that plantar fascia irritation is generally NOT an inflammatory injury and should not be called plantar fasciitis. It is a degenerative injury and should be called plantar fasciosis or plantar fasciopathy.

Causes

Contributing factors may include being overweight, weakness in the lower leg/foot complex, excessive standing, walking or running, menopause, flat feet, standing, walking or running on hard surfaces, wearing non-supportive shoes, being pregnant as well as tight hamstrings, calves and/or foot muscles.

It is a particularly common injury in runners and comprises approximately 10% of all running injuries. It is frequently caused by simply increasing your mileage and/or intensity too quickly. Other training factors that can irritate the plantar include running in old, worn out shoes, wearing the wrong running shoes for your foot type, running on unstable surfaces such as a sandy beach, logging a lot of miles on concrete and excessive hill running.

Treatment

It is extremely important to start to treat plantar irritation as soon as possible. The sooner you start treatment, the more quickly it will go away. The first course of action is to decrease the amount of stress placed on the plantar. Limit time on your feet and minimize doing activities that cause irritation. During the day, you should be taping the arch, wearing an orthotic and wearing generally supportive and comfortable shoes. Using a splint or strassburg sock at night will lengthen the plantar and should help with any pain and stiffness that is experienced first thing in the morning. You should also make sure to stay out of high heels and ill-fitted or uncomfortable shoes. If walking barefoot irritates the plantar then try to walk in comfortable shoes (preferably supportive running or walking shoes) as much as possible.

The foundation of our treatment protocol revolves around four key principles: massage, mobilization, stretching and strengthening. Massage is geared around treating trigger points that may refer pain, cause muscle inhibition and decrease range of motion. Mobility is focused on movement, proprioception and stimulating the circulatory and lymph systems. Stretching is done to increase range of motion. And strengthening is designed to make sure muscles are engaged and firing in ways that allow them to support the stresses that are placed on the foot/lower leg complex. This is not an inflammatory injury and therefore anti-inflammatories should not be part of the treatment protocol. The numbing effect of ice/cold therapy may have a positive impact on the pain response from the central nervous system, but keep in mind that heat can potentially have the same impact. If icing seems to help, then do it. If icing makes things worse or has no impact, you should stop. The same can be said of heating the foot.

For More Information

This packet provides a great general outline for treating plantar fasciopathy. For more specific guidance, you can contact us directly. We are available for in person appointments at our clinics in Palo Alto and San Francisco or for telehealth virtual appointments. For more information, visit our website at www.smiweb.org OR contact Mark Fadil at Mark@smiweb.org or 650-823-1091.

Taping

Taping your own arch every day can be a bit difficult but if done correctly, it can take significant stress off the plantar fascia. Try to tape your foot each morning and remove the tape at the end of the day so that you minimize the potential for skin irritation from the glue. Below we demonstrate a relatively easy yet effective way to tape your own foot. Cross the foot you are taping over the opposite knee and put the plantar in a stretch position by lifting your foot and toes up towards your knee. Using a strip of tape approximately 3 inches long, place one edge of the tape at the outside of the heel and pull the tape with hard tension to the inside of the heel (*Figure A*). Place a second strip overlapping the first strip and repeat in a similar fashion with a total of 3-4 strips so that the entire arch is covered (*Figure B*). Use one more long strip of tape that wraps around the entire foot to hold the smaller strips in place (*Figure C*).



Figure A



Figure B



Figure C

Orthotics

Orthotics in combination with taping provides a double dose of support for the arch and takes significant stress off the plantar when weight bearing. Over the counter orthotics tend to work just as well as custom orthotics the vast majority of the time. Keep in mind that unless otherwise necessary, an orthotic should only be used as a temporary way to reduce stress on the plantar. Once the irritation has subsided, gradually reduce the use of the orthotic.

Night Splints

Using a splint or the Strassburg Sock at night is an effective way to keep the plantar as well as calf and intrinsic foot muscles stretched out over the course of the night. This is particularly useful when having pain and discomfort first thing in the morning.

Movement

Movement and muscle activation is an effective technique to expedite virtually all stress overload injuries such as plantar fasciopathy. Movement stimulates the circulatory system which brings fresh bloodflow and nutrients to injured tissue. Movement also activates the lymphatic system which removes waste. The more efficiently these two systems are operating, the faster recovery will take place. For the plantar, this can be accomplished with three simple movements in a non-weightbearing position. First, simply point your toes up and down. Second, make a clockwise movement with the foot. And lastly, make a counter-clockwise movement with the foot. Try to go through these movements for approximately 5 minutes multiple times throughout the day. It is also important to do this before getting out of bed in the morning. It is possible that use of an Electrical Muscle Stimulator (EMS) machine can have a similar effect.

Self-Massage

Massage should be done on a daily basis. It can help eliminate tight areas and release trigger points that may be contributing to pain and dysfunction. We recommend spending 10-15 minutes a day massaging the calf and foot. All treatments are demonstrated on the right side. The self massage tools shown here can be purchased from PHLX at www.phlxtherapy.com.

CALF with PHLX roll

Start by placing both calves onto the PHLX roll. Roll back and forth from your heels to right below the back of your knees. Hold if you find a tight knot or band. You can also flex and extend your foot until the tight area begins to soften and loosen up. To generate more pressure, place one leg on top of the other as shown in *Figure D*.



Figure D

CALF with PHLX stick

Slide the PHLX stick up and down the calf. If you find a tight band or knot OR an area that feels “gravelly,” move the stick back and forth with short, quick strokes until the tissue softens and the stick slides more smoothly. Pressure should be moderate.



Figure E



Figure F

FOOT

Slide the PHLX stick back and forth along the bottom of the foot as shown in *Figure F*. When you find a “tight” and/or tender knot or band, focus the pressure on this area. Point your toes back and forth until you feel the tissue “soften” and become less painful.

CROSS FIBER FRICTION

In addition to more conventional massage, you should also incorporate cross fiber friction directly on the painful area. Simply cross the affected foot over the opposite knee as shown in *Figure G* and place your thumb onto the tender spot. Do not slide your thumb over the skin. Move your thumb and skin together over the underlying tissue. Move your thumb back and forth for 3-5 minutes. This will often times be a bit painful when you start but should become less painful during the treatment. This is a great way to warm up the plantar prior to activity.



Figure G

Mobilization

The mobilizations outlined here should be completed 2-3 times per day when treating plantar fascia pain. When performing the mobilization, move into position until you start to feel a stretch and then return to the starting position. The mobilization should be a continuous movement without stopping. Repeat up to 50 times, slightly increasing the range of motion with each rep. An uncomfortable stretch feeling is OK, but make sure that you do not cause pain or irritation during or after the mobilization. All mobilizations are shown for the right leg.

ROTATIONAL HAMSTRING

Stand on your left foot and place your right heel on a surface below waist level (*Figure H*). Keep your right leg straight but do not lock your knee. Lean forward from the waist and keep your back straight. Rotate your torso to the right and then to the left so that you are alternately facing to the outside and inside of your right leg before returning to the starting position.

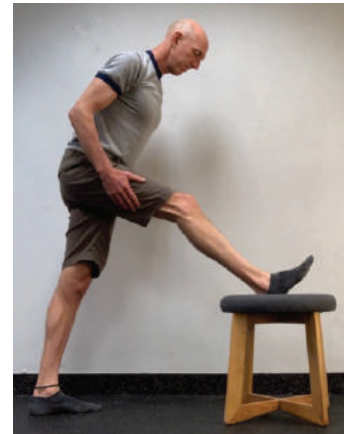


Figure H

CALF

Place your hands on a wall as shown. Bend the knee closest to the wall and let your pelvis shift forward. The mobilization is for the calf further from the wall. Your weight should be focused on the heel of the back leg and not the forefoot. It is important to incorporate both versions described below.

1. Keep the back knee straight as shown in *Figure I* to focus on the gastrocnemius.
2. Keep the back knee bent as shown in *Figure J* to focus on the soleus/Achilles.



Figure I

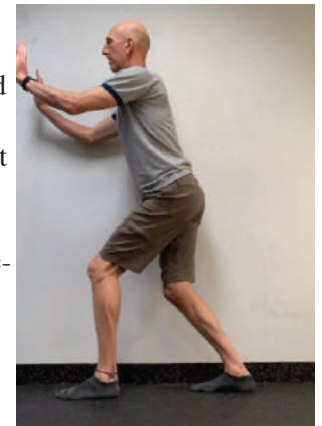


Figure J

Stretching

The stretching outlined here should be completed 2-3 times per day when treating plantar fascia pain. When performing the stretch, move into position until you start to feel a stretch and hold for 60 seconds. Repeat the stretch for a total of 3-4 times. An uncomfortable stretch feeling is OK, but make sure that you do not cause pain or irritation during or after the stretch.

ARCH

Pull on your toes as shown in *Figure K*.



Figure K

“Broken Toe” Pose

The “broken toe” yoga pose (*Figure L*) is a great way to stretch the arch. It is a more aggressive arch stretch than the one demonstrated in *Figure K*.

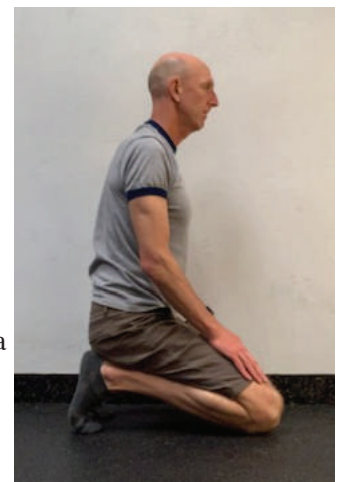


Figure L

Strengthening

One of the keys to proper strengthening is not doing too much too soon. A good general guideline to follow is to strengthen every other day for the first week, two out of every three days for the second week and every day from the third week on.

TOE WALKING

Keep your upper body erect and hold your hands behind your back. Come up onto your toes as high as you can. Your heels should not touch the ground during the entire exercise. Keep your weight focused over the big toe. Walk forward taking very short steps. Walk for 15 meters with your toes pointed straight ahead, 15 meters with your toes pointed 20 degrees inwards and 15 meters with your toes pointed out 20 degrees.



Figure M

FOOT EXTENSION

Wrap the elastic band around the top of your foot as shown in *Figure M*. Pull the foot straight up against the resistance of the band. Take 2 seconds to pull the foot up and hold for 2 seconds at the end range before you return to the starting position. Repeat by pulling the foot up again but this time at an angle 20 degrees to the inside and a third time 20 degrees to the outside.

Figure N

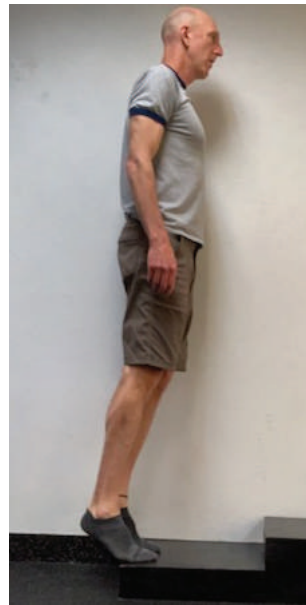
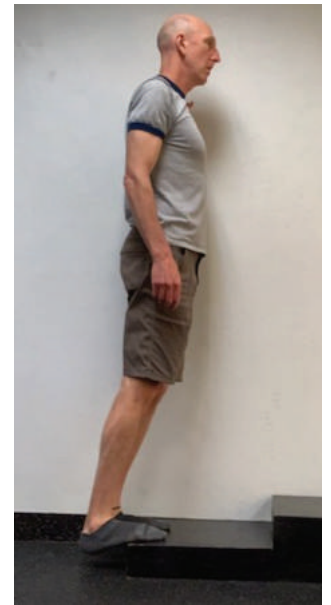


Figure O



ANKLE INVERSION/EVERSION

For ankle eversion, start with your foot pointed up and in (*Figure P*). Slowly turn your foot down and out against the resistance of the band (*Figure Q*). Focus on pushing the ball of the foot out and towards the ground. Then slowly let the foot return to the starting position. For inversion, start with your foot pointed up and out and slowly turn your foot down and in. The band should be pulled up and out for inversion.



Figure P

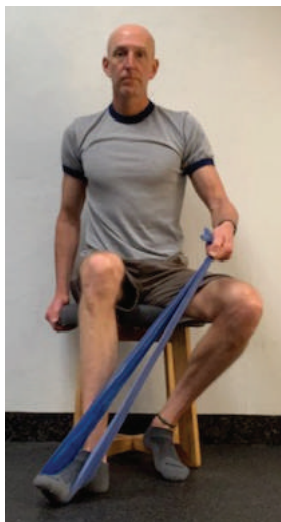


Figure Q

HEEL DROPS

Stand on your toes with both heels off the edge of a stair (*Figure N*). Slowly drop your heels down as far as you can (*Figure O*). Hold the end position for 2 seconds before coming back up onto your toes. Keep your weight focused over your big toe. Repeat with your feet pointed out 20 degrees and then again with your feet pointed in 20 degrees. Progress the exercise by placing a rolled up towel underneath your toes. Eventually you can advance to doing this exercise balancing on one foot at a time.