

Plantar Fasciitis: Steps in Management

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Abstract:

Plantar fasciitis is one of the most common causes of heel pain. It involves inflammation of a thick band of fascia that runs across the bottom of your foot and connects your heel bone to your toes.⁷ The peak incidence occurs between ages 40 and 60 years in the general population, which is within the age range of the patient in this case.¹ It is estimated to be responsible for about one million patient visits to the doctor per year in the United States.² The etiology of plantar fasciitis is poorly understood and is one that is multifactorial.³ Under normal circumstances, your plantar fascia acts like a shock-absorbing bowstring, supporting the arch in your foot, if tension and stress on that bowstring become too great, small tears can arise in the fascia.³ Repetitive stretching and tearing can cause the fascia to become irritated or inflamed.⁷ The diagnosis of plantar fasciitis is made based on the patient medical history and physical examination.³ As well as supported by imaging to rule out other causes of heel pain such as fractures.³

Background:

Plantar fasciitis typically causes a stabbing pain in the bottom of your foot near the heel.⁷ The pain is usually the worst with the first few steps after awakening, although it can also be triggered by long periods of standing or rising from sitting.¹¹ The pain is usually worse after exercise but not during it.¹¹ Though plantar fasciitis can arise without an obvious cause, factors that can increase your risk of developing plantar fasciitis include: include obesity, prolonged standing or jumping and reduced ankle dorsiflexion.⁴ Foot mechanics is another risk factor for plantar fasciitis.⁷ Being flat-footed, having a high arch or even having an abnormal pattern of walking can affect the way weight is distributed when you're standing and put added stress on the plantar fascia.¹⁰ Certain types of exercise such as long-distance running activities that place a lot of stress on your heel and attached tissue can also increase the risk.³ In particular for the patient in this case occupations that keep you on your feet is another contributing factor. Factory workers, teachers and others who spend most of their work hours walking or standing on hard surfaces can damage their plantar fascia.⁷

Diagnosis:

The diagnosis is made based on the medical history and physical examination.³ During the physical examination, palpation of the foot and more specifically areas that correlate with plantar fasciitis are performed.⁵ Palpation is then performed along the plantar fascial bands, which may further confirm the diagnosis of plantar fasciitis if any of the bands are painful to palpation, especially the medial band.⁶

Imaging tests:

Radiographs are a valuable tool in ruling out acute bone abnormalities such as a stress fracture.⁶ Sometimes an X-ray shows a spur of bone projecting forward from the heel bone. In the past, these bone spurs were often blamed for heel pain and removed surgically. But many people who have bone spurs on their heels have no heel pain.⁷

Ultrasonography is inexpensive and useful in ruling out soft tissue pathology of the heel. Findings that support the diagnosis of plantar fasciitis include proximal plantar fascia thickness greater than 4 mm and areas of hypoechogenicity.⁶

Magnetic resonance imaging, although expensive, is a valuable tool for assessing causes of reoccurring heel pain.^{8,9} Diagnostic findings include increased proximal plantar fascia thickening with increased signal intensity on T2-weighted images.⁶

Treatment:

Plantar fasciitis is a self-limiting condition, usually improves within one year regardless of treatment.⁶ Many patients will seek help from their physician because of disabling heel pain with activities of daily living.⁶ Most people who have plantar fasciitis recover with conservative treatments, including resting, icing the painful area and stretching, in several months.^{6,7} Plantar fasciitis may result in chronic heel pain that hinders your regular activities. Changing gait to minimize plantar fasciitis pain might lead to foot, knee, hip or back problems.⁷ Surgical interventions are reserved for chronic or refractory cases of plantar fasciitis and are required only in about 1% of patients suffering from plantar fasciitis.⁶

Medications:

Pain relievers such as Non-steroidal anti-inflammatory drugs can ease the pain and inflammation associated with plantar fasciitis.^{3,7}

Therapies:

Stretching and strengthening exercises or use of specialized devices may provide symptom relief.¹¹ These include:

Ice- Hold a cloth-covered ice pack over the area of pain for 15 to 20 minutes three or four times a day or after activity. Or try ice massage. Freeze a water-filled paper cup and roll it over the site of discomfort for about five to seven minutes. Regular ice massage can help reduce pain and inflammation.⁷

Stretching- Series of exercises to stretch the plantar fascia and Achilles tendon and to strengthen lower leg muscles, which stabilize your ankle and heel.¹¹

Night splints- This holds the plantar fascia and Achilles tendon in a lengthened position overnight and facilitates stretching.⁵

Orthotics- arch supports to help distribute pressure to your feet more evenly.⁵

Supportive shoes- Good arch support and shock absorbency. Don't go barefoot, especially on hard surfaces.⁷

Surgical or other procedures:

If more-conservative measures are not providing symptom relief these therapeutic methods can be recommended.

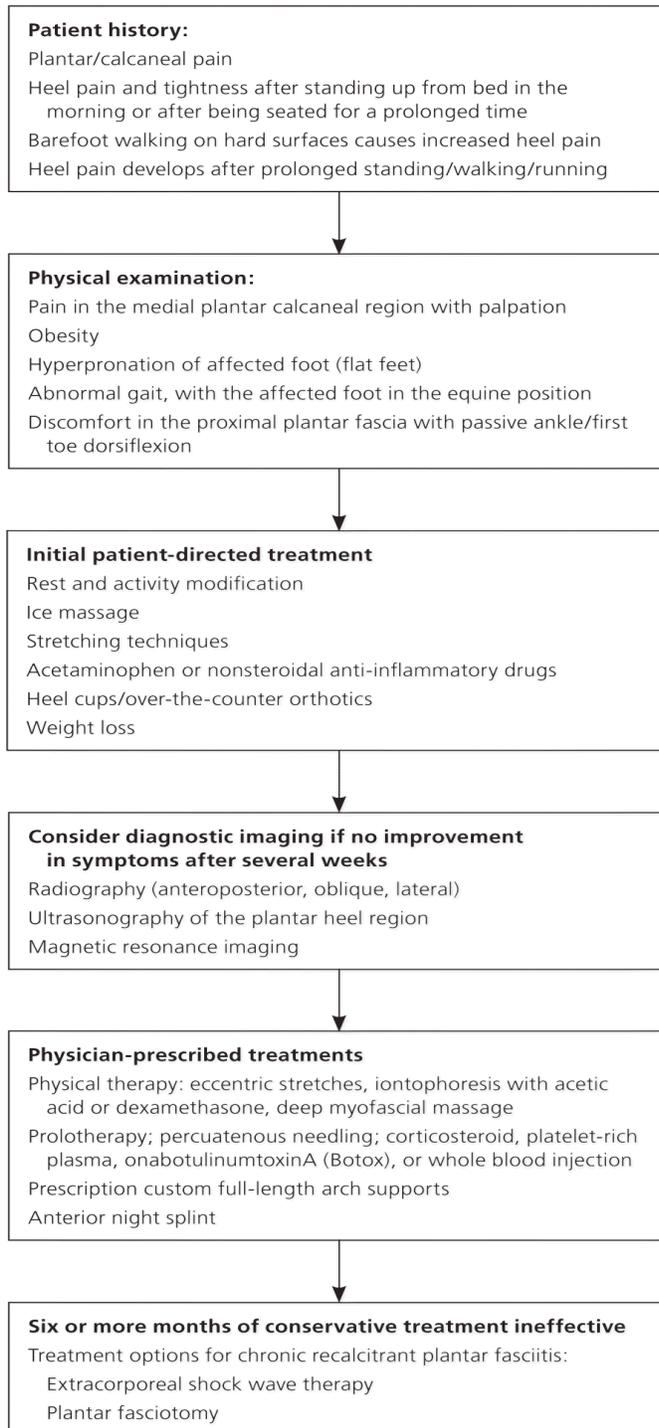
Injections- Injecting a type of steroid medication into the tender area can provide temporary pain relief.⁷ Multiple injections aren't recommended because they can weaken your plantar fascia and possibly cause it to rupture.⁷

Extracorporeal shock wave therapy-In this procedure, sound waves are directed at the area of heel pain to stimulate healing.⁷ It's usually used for chronic plantar fasciitis that hasn't responded to more-conservative treatments. This procedure might cause bruising, swelling, pain, numbness or tingling.⁷

Tenex procedure-This minimally invasive procedure removes the scar tissue of plantar fasciitis without surgery.⁷

Surgery- Few people need surgery to detach the plantar fascia from the heel bone. It's generally an option only when the pain is severe and not responsive to other therapy. Side effects include a weakening of the arch in your foot.^{3,5,7}

Figure 1. Treatment Planning for Patients with Plantar Fasciitis.⁶ *The diagnosis and treatment of heel pain: a clinical practice guideline.*¹⁰



Case History:

Among the highly prevalent cases of HTN and diabetes this next case stood out to me in my time in Agassiz clinic. 56-year-old man presented to clinic with a five months history of worsening heel pain which is more prominent on the left heel. Patient works at RONA, which requires standing and walking on hard concrete surface for about 8 hrs per day. Pain is noted at the attachment of the tendon at the heel of the foot, pain does not radiate anywhere else. Pain is described as stabbing pain at the bottom of the heel, does not radiate anywhere else. Foot pain is worsened by walking or standing for a long period. It is improved with rest and denies any nighttime pain. Icing and Compression ankle supports have been helpful for pain relief. Patient has been using 400 mg Advil 4 times per day, sometimes Tylenol 3 for pain management. Patient has also tried some heel stretches which alleviates symptoms for a short period but has not had success relieving the pain completely has also had some positive effect on the pain. No numbness or tingling on foot. No similar previous history. Patient has had a fracture to left foot/ ankle previously but denies any recent trauma.

Physical Examination:

On physical exam, the patient looks generally well, pleasant with good affect. No change in active or passive range of motion noted. No muscle atrophy or asymmetry. The patient walked with a slight limp. Severe Tenderness along plantar fascia noted. Tenderness was worse on the heel attachment of the plantar fascia and also more prominent on the left foot. Patient had a plano-valgus foot with forefoot abduction along with some toe hammering.

Imaging:

An xray was done to rule out any fractures which showed no significant bone or joint abnormalities. Patient had no evidence spurs.

Discussion:

Patient was diagnosed with plantar fasciitis. The diagnosis was based on the medical history and physical examination of the patient. The patient's occupation being one of the main risk factors in this case, standing for long periods on a hard surface.³ Another risk factor that contributed to the diagnosis is the patients foot mechanics. The patient had plano-valgus feet putting them a higher risk.⁷ As the patient's occupation

involves standing and walking for majority of the work day, resting for long period was not a reasonable option.

Patient directed therapy was initially started with lifestyle changes to improve pain. Patient started by wearing supportive shoes with good arch support while at work. Icing would improve pain for a short period of time but found that it was not a good at completely relieving pain. Following the persistence of the heel pain, patient started with oral NSAIDS for pain control. As well as diclofenac 8% gel three times daily application, along with daily stretches.

Symptoms Persisted after the initial conservative managements which then prompted some imaging to rule out other causes of heel pain. Radiographs did not show any bone or joint abnormalities. Since the patients functioning at work was being affected, further treatment modalities were explored. For long term symptom relief arch supports orthotics were prescribed to help distribute pressure more evenly. After explaining the risks and benefits of corticosteroids patient agreed to proceed with the injection for short term pain relief.

Conclusion:

Although plantar fasciitis is a self-limiting condition we have to consider the patient as a whole when discussing management. Conservative management is first line for plantar fasciitis. Symptoms should subside within one year regardless of treatment but given the occupation of the patient pain management is critical for daily functioning.⁶ There was not much benefit with the patient directed conservative management options such as, icing, stretches and NSAIDs. Therefore, patient was prescribed cortisone injections for short term pain control and orthotics for long term management after discussion of side effects and benefits. Prevention of recurrence lies in continued stretching exercises, shoe modifications to a more stable and supportive shoe, and continued use of the prescribed orthotics.⁶

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