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Diagnosis and Management of Plantar Fasciitis in Primary Care

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ABSTRACT

Patients with foot pain present to their primary care providers for treatment. Plantar fasciitis is easily diagnosed based on history and exam with little to no need for diagnostic testing. Initial treatment is conservative and is easily initiated in the primary care office, with the focus on alleviation and resolution of the foot pain. Initial treatment modalities include taping, icing, proper footwear, stretching, and rest. When pain persists, other modalities include night splints or referrals to physical therapy and podiatry or orthopedic or sports medicine for a corticosteroid injection.

Keywords: foot pain, heel pain, plantar fasciitis, plantar fasciosis

Plantar fasciitis accounts for at least 1 million health care visits per year. There has been no recent documented data on the incidence of plantar fasciitis, but, in 2010, it occurred in approximately 10% of the United States population with treatment costs of $192-376 million.[1] It is a self-limiting disorder that has a multifactorial etiology. It can occur in both active and sedentary individuals.[2,3] There are risks factors associated with plantar fasciitis (see Table 1). The term *fasciitis* indicates an acute inflammatory process, but current research is indicating that it is more of a chronic degenerative process or fasciosis.[4] Treatment for the condition can occur in the primary care practice for the majority of the patients, with refractory cases needing specialty care.

ANATOMY AND PATHOPHYSIOLOGY

The plantar fascia is comprised of 3 bands of dense, fibrous connective tissue on the plantar aspect of the foot. It is a tendinous aponeurosis or sheet of connective tissue that incorporates the muscles on the sole of the foot.[5] The bands originate in the medial tubercle of the calcaneus and terminate at the base of the proximal phalanges. These 3 bands (medial, central, and lateral) are the main parts of the longitudinal arch, connecting the 3 points of weight-bearing in the foot.[6]

In the early onset of plantar fasciitis, the fascia is damaged as a result of repetitive load-bearing, resulting in microtrauma. An inflammatory reaction develops bringing macrophages, lymphocytes, and plasma cells to the area of injury. If repetitive trauma continues, the inflammatory response is not able to tolerate the increased demand and fibrosis results. With fibrosis, tissue inflammation changes into tissue degeneration or fasciosis and thickening of the plantar fascia, resulting in a reduction of elasticity.[5]

Some believe that plantar fasciitis or fasciosis is a degenerative condition as there are no classic signs of inflammation such as erythema, edema, leukocyte, or macrophage infiltration.[7]

CLINICAL PRESENTATION

The classic symptom of plantar fasciitis is pain with the first step out of bed in the morning. The pain is generally worse in the morning and may improve throughout the day. This pain may exacerbate with prolonged standing or sitting. The pain is a result of the initial stretching of inflamed fascia after a prolonged period of rest. The location of pain is predominately on the bottom of the foot in or near the heel. The pain can be throbbing, dull, or burning. Patients note that the pain is worse with barefoot walking or walking in flat shoes with no support.

The physical exam consists of pain with palpation of the medial plantar aspect and point tenderness

Table 1. Risk Factors for Plantar Fasciitis[a]

Female gender
Runners—mainly long distance
Military personnel
Occupations that require prolonged standing
Obesity
Flat feet
High arches
Sedentary lifestyle
Decreased ankle flexion, tightness of Achilles tendon
Barefoot walking or poor footwear (flip-flops)

[a] These are the most common risk factors, but diagnosis is not limited to these risks, as some individuals who develop plantar fasciitis do not possess any of the listed risk factors.

where the fascia inserts into the medial calcaneus. Passive dorsiflexion of the toes and ankle or a Windlass test elicits pain in the medial plantar aspect.[3] In addition to the pain, there is usually decreased range of motion in the ankle. Ankle dorsiflexion of $\leq 10^{\circ}$ has been identified as a risk factor for plantar fasciitis.[8] Differential diagnoses for plantar fasciitis as the cause of plantar heel pain include heel contusion, neuropathy, posterior tibial tendonitis, tarsal tunnel syndrome, calcaneal fracture or tumor, Sever's disease, arthritis, Achilles tendonitis, plantar fascia rupture, and retrocalcaneal bursitis.[2]

DIAGNOSTIC TESTS

Diagnosis of plantar fasciitis is made principally on history and physical. Diagnostic testing is unnecessary and rarely indicated for acute plantar pain unless there is a history of trauma to the foot, an atypical presentation, or the patient's symptoms are refractory to treatment measures.[9] Radiography ultrasound and magnetic resonance imaging (MRI) assist in the confirmation of plantar fasciitis and estimation of the degree of thickening of the plantar fascia. If radiologic testing is required, the radiographs are the first test ordered to rule out other foot pathology. Ultrasound and MRI are used later for more focused measurement and evaluation of the plantar fascia.

Radiography

Radiographs are the least specific in identifying plantar fasciitis, but can help to identify other foot pathology. They can also indicate a calcaneal spur, although calcaneal spurs are not indicative of plantar fasciitis. Individuals may have calcaneal spurs without plantar foot pain.[2,10] Generally, weight-bearing radiographs are preferred in the evaluation of heel pain.

Ultrasound

Ultrasound is an inexpensive method to rule out pathology and confirm diagnosis of plantar fasciitis. Its specificity in evaluating plantar fasciitis is highly operator-dependent.[11] The ultrasound measures the thickness of the proximal plantar fascia and locates areas of hypoechogenicity. A thickness of > 4 mm supports the diagnosis of plantar fasciitis.[2]

MRI

When a patient has an atypical presentation of plantar fasciitis or is failing conservative treatment, MRI is indicated. MRI can delineate between soft tissue and the bones of the foot and can help guide diagnosis and treatment of plantar fasciitis. Findings consistent with plantar fasciitis are thickness of the proximal plantar fascia and signal intensity increases.[2,8] Other MRI findings may include signs of plantar fascia tear or rupture.

TREATMENT

Treatments for plantar fasciitis can be classified into stages based on the time of symptom onset (see Table 2). Initial treatment of acute plantar fasciitis includes conservative methods that can be initiated in the primary care office. Acute-phase treatment continues until resolution of symptoms, or until symptoms last > 6 weeks or worsen. Treatment modalities include rest, taping, icing, stretching, proper footwear, footwear inserts such as heel cups or arch supports, and oral anti-inflammatory agents. The aim of these treatments is to decrease the acute inflammation and prevent plantar fasciosis.

Rest

Rest or activity modification helps decrease the inflammation of the plantar fascia, which also decreases pain. Reducing the pressure on the fascia by decreasing the amount of time standing and choosing nonimpact exercise, such as cycling or swimming,