



Plantar Fasciitis

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Abstract

A common complaint of many people who need expert orthopedic therapy and are mostly experiencing persistent discomfort behind their heels is heel pain, which is typically brought on by Plantar Fasciitis (PF). The current article reviews research on the anatomy of plantar fasciitis and its histo-pathological characteristics, factors that contribute to PF, clinical characteristics, imaging studies, differential diagnoses, and various treatment modalities for PF, with a focus on non-surgical treatment. In patients with PF, anti-inflammatory drugs, plantar stretching, and orthoses were found to be of the utmost importance; corticosteroid injection, night splints, and extracorporeal shock wave therapy were of the next-highest importance. Surgical intervention should be taken into consideration if a patient is resistant to the aforementioned treatments.

Keywords: Plantar fasciitis; Orthopedic therapy; Plantar fasciitis; Anti-inflammatory; Corticosteroid injection; Extracorporeal shock

Introduction

In the foot and ankle clinic, heel pain is a frequent presenting complaint, and Plantar Fasciitis (PF), which accounts for 11–15% of adult patients' foot complaints requiring professional attention, is the most common cause of adults' persistent discomfort below the heel. According to estimates, 1 in 10 persons will experience PF at some point in their lives. PF is more prevalent in young male athletes and obese middle-aged female athletes, while not all cases of the disease necessitate medical attention. PF has been referred to in the literature as runner's heel, painful heel syndrome, persistent plantar heel pain, heel spur syndrome, and calcaneal periostitis [1].

Search strategy

This review, which naturally excludes findings in languages other than English, includes peer-reviewed journal papers that primarily address plantar heel pain. The following databases were used to find studies: Web of Science (from 1980 to 2012), EMBASE (from 1980 to 2012), CINAHL (from 1982 to 2012), PubMed (from 1980 to 2012), Ovid Medline (from 1980 to 2010), and Cochrane Database of Systematic Reviews. (From 1985 through 2012) AMED. Journal articles were found by matching the keywords "heel pain," "painful heel," "plantar fasciitis," and "heel spur" with the search terms treatment and management [2].

Pathological feature

Understanding the local anatomy comes before making a differential diagnosis of PF. A full honeycombed fibro-fatty fat pad that serves as a shock absorber separates the calcaneum from the plantar surface. Both lateral and medial processes can be found on the calcaneum's posterior tuberosity. The Flexor Digitorum Brevis (FDB), Abductor Hallucis (AH), medial head of Quadratus Plantae (QP), and the central band of plantar fascia are all attached to the medial process. The calcaneum (an entheses), whose central band is constant along with the medial and lateral band, has a direct fibrocartilaginous attachment to the plantar fascia or deep fascia of the sole. It has a triangle shape and grows from the medial process of the calcaneal tuberosity. At mid-metatarsal level, it diverges distally into five independent strands, which are linked to the plantar skin and the base of the proximal phalanges at the forefoot [3, 4].

Despite the great prevalence of PF, there is still little known

about its pathophysiology, and its histological abnormalities point more toward degeneration than inflammation. Typically, the fascia is noticeably thicker and grittier. The established descriptor in the literature for these pathologic alterations is fasciitis, despite the fact that fasciosis (a degenerative process) is more consistent with it than fasciitis (an inflammatory disease). According to histological data, spur creation can take place in loose connective tissue, around fibrocartilage that may not be aligned with the direction of traction, and spur trabeculae that frequently form perpendicular to the long axis of the spur. Additionally, clinical studies have demonstrated that spur growth can happen following surgical relaxation of the plantar fascia and is unrelated to medial arch height [5].

Factors associated with PF

Finding the causes of PF will aid in identifying those who are at risk and the creation of fresh, more effective prevention and therapeutic approaches. Up to 70% of people with PF have obesity. Increased Body Mass Index (BMI) and PF in a group of non-athletes are strongly associated, according to the literature. According to the findings, height is not associated with PF, in contrast to weight. More specifically, weight gain, but not necessarily shorter stature, is linked to PF. It's interesting to note that in a group of athletes, there is no relationship between PF and weight, height, or BMI. Heel spurs have frequently been mentioned as a PF risk factor. Recent research shows a significantly substantial correlation between PF and calcaneal spur. Additionally, there is a shaky correlation between PF and growing older, extended standing, decreased first MTP joint extension, and decreased ankle dorsiflexion [6].

Diagnosis

Most of the time, PF can be diagnosed clinically and requires little additional research. The patient complains of pain in the medial side of

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the heel, which is worse with initial steps after a period of inactivity and typically gets better as the patient increases their level of activity during the day. Long-term weight bearing can exacerbate symptoms, which is frequently brought on by an increase in weight-bearing activities. Paresthesia is a rare condition. PF often presents unilaterally, although up to 30% of cases do so. Nearly 80% of times, the Achilles tendon is found to be tight.

Treatment

PF's self-limited natural history is frequently observed. However, the normal resolution period can be anywhere between 6 and 18 months, and occasionally longer, which can result in patient and doctor frustration. The majority of experts concur that managing PF early on results in a shorter treatment period and a higher likelihood of success with conservative therapy. Rest, heat, ice, NSAIDs, magnetic insoles, night splints, walking casts, taping, stretching of the plantar and Achilles tendons, ultrasound, steroid injections, extracorporeal shock wave therapy, platelet-rich plasma injections, pulsed radiofrequency electromagnetic field therapy, and surgery are just a few of the interventions that have been described for the treatment of PF. Unfortunately, there aren't enough high-quality randomized, controlled trials that support these treatments.

Stretching

Stretching could be done in the plantar or calf area. Calf stretching has been suggested as one of the therapies for PF patients by a number of publications. A calf stretch is done while the patient is standing with their legs slightly apart and their backs to a wall. The dosage for calf stretching can either be three minutes at a time, three times per day, or five 20-second intervals, twice per day, because both have the same impact. Calf stretching has some justification due to the continuity of the connective tissue between the Achilles tendon and the plantar fascia as well as the fact that decreased ankle dorsiflexion is a risk factor for the development of plantar fasciitis [7].

Night splints

By keeping the patient's ankle in a neutral position while they sleep, night splints passively stretch the calf and plantar fascia. The several varieties of night splints, whose goal is to promote fascia healing, are identical to one another. The effectiveness of night splints, which are advised to be worn for 1-3 months and should be taken into consideration as an intervention for patients with symptoms that have persisted for more than six months, is moderately supported by the available research [8].

Orthosis

According to Ribeiro et al.'s findings, the pain reduction mechanism obtained by the use of insoles would be mostly related to its supporting function of the longitudinal arch and not to the overload reduction over the plantar surface. The rationale for using foot orthoses was to decrease abnormal foot pronation that was thought to cause increased stress on the plantar fascia. The effectiveness of treatment, which is highly advised to be utilized to give a short-term (3 month) reduction in pain and improvement in function, does not seem to differ between prefabricated or bespoke foot orthoses. With relation to the long-term (12 month) use of orthotic devices, there is conflicting evidence [9].

Surgery

Surgery is often reserved for stubborn instances where symptoms continue for more than 6 to 12 months despite effective conservative care. If the posterior tibial nerve is compressed, nerve conduction and electromyographic investigations should be taken into account before surgery. The plantar fascia can be released openly or endoscopically.

Endoscopic plantar fasciotomy has a number of benefits, such as little soft tissue dissection, better plantar fascia visualization, little post-operative pain, and quicker return to work. The American Orthopaedic Foot and Ankle Society advise against doing an endoscopic release if there is a possibility of nerve compression. All in all, open partial plantar fascia release with concurrent release of the first branch of the lateral plantar nerve is still the preferred treatment [10].

Conclusion

Adults who experience pain in their lower heels most frequently have PF. The patient typically laments a gradual onset of pain along the heel's medial side. When you first wake up in the morning, the pain is stronger; but, after a few steps, it gets less intense. Rarely does imaging or electromyography need to be used to investigate the PF diagnosis, which is typically clinical. The majority of people with PF respond well to conservative treatment. It is advised to rest for a while while also using NSAIDs, cold packs or heat, stretching, and an orthosis to reduce inflammation. The type of orthosis utilized makes little difference, albeit plantar stretching appears to be more efficient. If the patient continues to experience symptoms, corticosteroid injection and a night splint may be appropriate (particularly for patients whose symptoms have persisted for more than six months). Prior to any surgical intervention in patients with refractory PF, ESWT should be taken into account.

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