ARTICLE IN PRESS

The Journal of Foot & Ankle Surgery ■■ (2017) ■■–■■

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

ACFAS Clinical Consensus Statement

American College of Foot and Ankle Surgeons Clinical Consensus Statement: Diagnosis and Treatment of Adult Acquired Infracalcaneal Heel Pain

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A R T I C L E   I N F O

Level of Clinical Evidence: 5

Keywords:
ACFAS
consensus
heel pain
infracalcaneal
plantar fasciitis

A B S T R A C T

Adult acquired inferior calcaneal heel pain is a common pathology seen in a foot and ankle practice. A literature review and expert panel discussion of the most common findings and treatment options are presented. Various diagnostic and treatment modalities are available to the practitioner. It is prudent to combine appropriate history and physical examination findings with patient-specific treatment modalities for optimum success. We present the most common diagnostic tools and treatment options, followed by a discussion of the appropriateness of each based on the published data and experience of the expert panel.

Executive Summary

The following document represents the findings of the adult acquired infracalcaneal heel pain consensus panel sponsored by the American College of Foot and Ankle Surgeons. The 6-member panel used a modified Delphi method to reach a clinical consensus regarding the diagnostic and treatment methods based on the best available evidence in the literature, combined with clinical experience and best patient practice.

The panel determined that the following statements are appropriate:

1. Plantar fasciitis is diagnosed, in most cases, by the history and physical examination findings alone.
2. Routine use of radiographs is not necessary for the diagnosis of nontraumatic plantar fasciitis.
3. The presence of a calcaneal spur will not generally alter the treatment course.
4. Advanced imaging, such as magnetic resonance imaging and ultrasonography, is not necessary for the diagnosis or guidance of treatment of nontraumatic plantar fasciitis.
5. In most cases, infracalcaneal heel pain is a soft tissue-based disorder and calcaneal spurring is most likely not a causative factor.
6. Appropriate treatment of plantar fasciitis requires sufficient understanding of the patient's chronicity of symptoms.
7. Biomechanical support is safe and effective in the treatment of plantar fasciitis.
8. Stretching is safe and effective in the treatment of plantar fasciitis.
9. Corticosteroid injections are safe and effective in the treatment of plantar fasciitis.

Financial Disclosure: The development of this consensus statement was funded by The American College of Foot and Ankle Surgeons, Chicago, IL.

Conflict of Interest: Revance Therapeutics sponsored A. Fleischer's research on botulinum toxin injection for plantar fasciitis.

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1067-2516/$ - see front matter
https://doi.org/10.1053/j.jfas.2017.10.018

10. Extracorporeal shockwave therapy (ESWT) is safe and effective in the treatment of plantar fasciitis.
11. Plantar fasciotomy (opened and endoscopic) is a safe and effective option for chronic, refractory plantar fasciitis.
12. Gastrocnemius release is a safe and effective option for chronic, refractory plantar fasciitis when clinically significant equinus is present.

The panel determined that the following statements were uncertain—neither appropriate nor inappropriate.

1. Nonsteroidal antiinflammatory drugs (NSAIDs) are safe and effective in the treatment of the pain associated with acute plantar fasciitis.
2. Diagnostic ultrasonography is an important adjuvant tool in the diagnosis and treatment of nontraumatic plantar fasciitis.
3. Other injection techniques (e.g., amniotic tissue, platelet-rich plasma, botulinum toxin, needling, and prolotherapy) are safe and effective in the treatment of plantar fasciitis.
4. Other surgical techniques (e.g., ultrasonic debridement using a microtip device, cryosurgery, and bipolar radiofrequency ablation) are safe and effective options for chronic, refractory plantar fasciitis.

This document was created to serve as a clinical consensus statement (CCS) from the American College of Foot and Ankle Surgeons (ACFAS) and serves as an update to the ACFAS's 2010 Heel Pain Clinical Practice Guideline (1). It is important to appreciate that consensus statements do not represent "clinical practice guidelines," "formal evidence reviews," "recommendations," or "evidence-based guidelines." Rather, a CCS reflects information synthesized by an organized group of content experts from the best available evidence. It can also contain opinions, uncertainties, and minority viewpoints. In contrast to clinical practice guidelines, which are based primarily on high-level evidence, clinical consensus statements are more applicable to situations where evidence is limited or lacking, yet there are still opportunities to reduce uncertainty and improve quality of care. A CCS should open the door to discussion on a topic, in contrast to attempting to provide definitive answers. Adherence to consensus statements will not ensure successful treatment in every clinical situation, and the physician should make the ultimate decision using all available clinical information and circumstances with respect to the appropriate treatment of an individual patient. Given the inevitable changes in the state of scientific information and technology, periodic review and revision will be necessary.

Anatomy of the Plantar Fascia

The plantar fascia is synonymous with the plantar aponeurosis of the foot and provides a mechanical linkage between the calcaneus and the toes. It is composed of densely compacted collagen fibers that are mainly oriented in a longitudinal direction, although some fibers run in a transverse and oblique direction (2). The plantar fascia arises mainly from the medial calcaneal tuberosity and attaches distally, through several slips, to the plantar forefoot and the medial and lateral intermuscular septa. Anatomically, it can be divided into the medial, lateral, and central components (3).

The medial band is anatomically thin and virtually nonexistent at its proximal level. Similarly, the lateral band varies in its structure from relatively thick to nonexistent in 12% of individuals (4,5). When present, the lateral band provides a partial origin for the abductor digiti minimi muscle. The lateral band then bifurcates into the medial and lateral crura at the cuboid level. The stronger lateral crux inserts into the base of the fifth metatarsal. The medial crux merges distally with the central band of the plantar fascia before coursing deep and inserting into the plantar plate of either the third, fourth, or fifth metatarsophalangeal joint (3).

The central band is triangular in shape and originates from the plantar medial process of the calcaneal tuberosity. The central band serves as the partial origin of the flexor digitorum brevis as it conforms to the plantar surface of the calcaneus. Ranging from 12 to 29 mm wide at its origin, the central plantar fascial band separates at the midmetatarsal level into 5 longitudinal bands (6). Each band then divides distally to the metatarsal heads to form deep and superficial tracts. The central superficial tracts insert onto the skin and contribute to the formation of the mooring and natatory ligaments (5). The 5 deep tracts separate to form medial and lateral sagittal septa, which contribute to the medial and lateral digital flexor, flexor tendon sheath, interosseous fascia, fascia of the transverse head of the adductor hallucis, deep transverse metatarsal ligament, and base of the proximal phalanges by way of the plantar plate and collateral ligaments (3).

The plantar calcaneal spur is a bony outgrowth of the calcaneal tuberosity that occurs, with some regularity, even in the general population (7). The association of the plantar calcaneal spur and plantar fascia is highly variable. The plantar calcaneal spur can be joined with all, part, or none of the plantar fascia. Tanz (8) first showed that the plantar calcaneal spur many times arises from the intrinsic muscles rather than from the plantar fascia itself. This finding was later corroborated by Forman and Green (9) and others. The plantar calcaneal spur is covered with a fibrous connective tissue layer, which is highly innervated and vascularized (7,10,11).

Histologic Properties of the Plantar Fascia

The plantar fascia is histologically different from both tendon and ligament and is typically described as a dense connective tissue (12). Similar to tendons and ligaments, the plantar fascia is composed primarily of elongated fibrocytes. These fibrocytes are responsible for the production of collagen and are arranged in longitudinal rows. They have short cell processes that surround the collagen fibers and form gap junctions with other fibrocytes from adjacent rows (3). Because of this gap junction network, Benjamin (13) proposed that fibrocytes form a 3-dimensional communicating network that might be capable of sensing and responding to load changes in the plantar fascia by modifying the shape of the cytoskeleton. Because the plantar fascia has more fibroblasts than do tendons, it is believed to have an even greater sensory capacity than tendon and might act as an active sensory structure by changing its composition to passively transmit force (3).

Rather than having an indirect periosteal attachment, the proximal attachment of the plantar fascia on the calcaneus is distinctly fibrocartilaginous (14). Histologically, fibrocartilaginous entheses have 4 zones of tissue: first is dense fibrous tissue of the collagenous midsubstance, which is replaced successively by uncalcified fibrocartilage, calcified fibrocartilage, and, finally, bone. The extent of calcification within the fibrocartilaginous region and the degree of osseous interdigitation is important in resisting shear forces and might reflect the tensile strength of the entheses. With calcified and uncalcified fibrocartilaginous zones, direct attachments can help to dissipate stress evenly and provide a gradual transition from hard to soft tissue (3). Similar to the plantar fascial insertion, fibrocartilage appears to be located specifically at sites subjected to bending, shear, or compressive forces, or a combination thereof. High concentrations of proteoglycans and glycosaminoglycans within fibrocartilage entheses suggest an important role in the redistribution of compressive or bending forces (3). Therefore, the material properties, or modulus of elasticity, of the plantar fascia and its insertion fall between those of tendon and ligament (3,15).