

Short communication



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Does the self-limiting condition of plantar fasciitis necessitate intrusive management techniques?

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Abstract

Plantar fasciitis (PF), a multifactorial and self-limiting enthesopathy, is treated very differently by each surgeon, and there is now substantial research being conducted worldwide, primarily focusing on invasive modes of management. Indiscriminate use of invasive methods for the treatment of PF is employed in poor nations like India, both in rural and urban settings, placing financial strain on patients and exposing them to unneeded trauma. On the basis of a prospective observational survey being done in our institute's orthopaedics department, we recommend adopting non-invasive, conservative therapeutic techniques. A scoping review of publications on various modalities of treatment of plantar fasciitis was conducted in the PubMed database using Mesh terms. Articles focusing on clinical trials were shortlisted and data extracted. The data extracted were tabulated. The author's recommendations for the management of plantar fasciitis and the algorithm formulated have been proposed.

Introduction

Plantar fasciitis, a multifactorial enthesopathy that is primarily degenerative in nature, is characterized by inflammation of both the perifascial tissues surrounding the plantar fascia (PF) and its origin at the medial calcaneal tuberosity. It can be caused by trauma or other complex conditions, but it commonly comes from an overuse injury that is typically caused by a repetitive strain that causes PF microtears. Becker *et al.* 2018 and Ling *et al.* 2018 in their respective studies stated that risk factors for plantar fasciitis include obesity, heel pad atrophy, aging, extended weight-bearing or standing, pes planus, pes cavus, heel spurs, tight gastrocnemius, soleus, and/or other posterior leg muscles, as well as occasionally seronegative spondyloarthropathies [1,2]. Orchard, 2012 in their trail stated that the absence of inflammatory cells in this condition makes it stand out despite the suffix "itis" in the diagnosis [3].

Research work done at National and International level: researchers across the globe have explored several methods of management of plantar fasciitis both aggressively: (Sharma *et al.* 2023) [4]; and conservatively notably; (Salehi *et al.* 2023) [5]; (Thong-On *et al.* 2023) [6]; (Thammajaree *et al.* 2023) [7]; (Raissi G *et al.* 2023) [8]; (Şah *et al.* 2023) [9]; (Fouda *et al.* 2023) [10].

Methods

A scoping review of publications on the topic of plantar fasciitis treatment was conducted using PubMed and Medline databases using the MeSH terms like Plantar Fascia, Non-invasive, and invasive treatment. The initial filters applied were of English language and human subjects. Forty-one (41) publications were found in the initial survey. After the application of inclusion and exclusion criteria, eight (8) clinical trials were shortlisted for synthesis in this study.

Inclusion criteria for review: clinical trials on invasive and non-invasive modalities of treatment of plantar fasciitis. Only publications in the English language and full and free online articles were included. Articles published between 1st January 2023 and 31st May 2023 were included.

Exclusion criteria for review: publications other than clinical trials were excluded. Abstracts and paid articles were excluded. Clinical trials focusing on conditions other than plantar fasciitis were excluded. Articles published before 1st January 2023 and after 31st May 2023 were excluded.

Data collection tools: a data extraction form/checklist was formulated by all the authors and was used to extract the desired data from the shortlisted articles. The data extraction was done by only two reviewers (AM and SC) from all eight articles using the checklist. Disagreements were addressed through dialogue and the participation of a third independent reviewer (SM). The data collected were regarding the modality of treatment, whether invasive or non-invasive; the

procedure of treatment; which patients will benefit from the modality and which patients will not benefit; and the relative cost of the modality of treatment.

Data entry and analysis: information extracted using the data extraction sheet or checklist was tabulated in Table 1.

Ethical considerations: ethical approval is not required for the review study of articles on databases. Ethical approval was however sought for the observational prospective survey of patients reporting with plantar fasciitis in the orthopedic out patient department (OPD) of the Institute.

Results

Out of the eight clinical trials, one trial was conducted on a comparison of the effect of platelet-rich plasma, ozone, and cortisone injections on sinus tarsi syndrome, hence was excluded from this study. Out of the remaining seven clinical trials, five clinical trials studied or compared the effect of various non-invasive modalities in plantar fasciitis patients, whereas, two trials studied and compared the effect of invasive modalities of treatment in plantar fasciitis. One trial: compared the effect of platelet-rich plasma versus corticosteroid injection [4]; one trial: studied and compared the effect of Ultrasound dextrose injection versus corticosteroid injection in chronic PF [8]; one study compared the effect of radial extracorporeal shock therapy versus high-intensity laser therapy in PF patients [7]; one trail; studied the effects of customized insoles with medial wedges on lower extremity kinematics and ultrasonographic findings in plantar fasciitis persons [6]; one randomized control trail compared the effects of dry needling and stretching exercise versus stretching exercise only on pain intensity, function, and sonographic characteristics of plantar fascia in the subjects with plantar fasciitis [5]. The various modalities of management of plantar fasciitis are summarized in Table 1.

Discussion

Problem statement: plantar fasciitis is a self-limiting condition, for which a lot of intervention has been tried from time to time but without reliable and reproducible results.

Current scenario in developing countries: currently, treatment protocols in developing countries is being guided and based on the research and recommendation published by surgeons across the globe. The most common interventions used at present are insoles, steroid injections, and various physio therapeutic modalities. More commonly, surgeons in rural as well as urban centres adhere to more aggressive management of plantar fasciitis, which is not required in most of cases. Hence, patients either revert with relapse or with complications like heel pad atrophy, fascial rupture, etc. Moreover, an aggressive line of management puts additional financial brunt on the patient, which actually is not required at all. With the aim to promote a non-invasive manner of management and propose conservative, non-invasive, physical therapy through a patient care program that is being run at our OPD.

Authors proposition: to counter the above practice in the medical field, a patient care program was initiated and is currently undergoing in the Outdoor Patient Department of Orthopedics. This program aims to promote conventional, non-invasive modalities of management to the patients reporting plantar fasciitis. This program was commenced based on the conclusions of an ongoing observational prospective survey of patients presenting with plantar fasciitis in the orthopedic department. The algorithm on the basis of which patients reporting with plantar fasciitis were treated at the Institute is mentioned below (Figure 1).

Conclusion

Since it's a self-limiting condition, so an approach to wait and watch and avoid aggravating conditions will be more appropriate in most of the conditions. The physical measure which is worth recommending and is physiological is log roll exercise and plantar stretching exercise.

What is known about this topic

- *It is a known fact that plantar fasciitis is a self-limiting condition, as do other enthesopathies;*
- *Extensive research is being conducted across the world on comparing and experimenting with various invasive modalities of treatment of plantar fasciitis with an intent to cure the condition all at one go.*

What this study adds

- *We present the observations of an observational prospective survey conducted in the orthopaedic outdoor patient department of our Institute, in which all the patients of plantar fasciitis (irrespective of severity and complications) have been successfully treated using non-invasive modalities of treatment like physical therapy, shock wave diathermy, etc;*
- *We present an algorithm of management of plantar fasciitis (PF), which shall guide orthopaedic surgeons and residents across the world and help in reducing the financial as well as physical stress caused due to invasive modes of management of PF.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Abhishek Kumar Mishra: conceptualization, and drafting; Sundip Hemant Charmode: conceptualization, design and drafting the manuscript; Akshat Gupta: conceptualization, and design; vishwa chauhan, simmi mehra: interpretation of radiological aspects. All the authors have read and agreed to the final manuscript.

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Table and figure

Table 1: list of currently available modalities of management of plantar fasciitis

Figure 1: algorithm for screening of patients presenting with pain in plantar aspect of the heel and sole

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Table 1: list of currently available modalities of management of plantar fasciitis

Sl. no	Type of management	Individuals who might benefit	Individuals who might not benefit	Relative cost
1	Orthotics (customized insoles with medial wedges)	Those with a longitudinal arch that is flattening in middle-age	Those who don't get any relief from low-dye taping	Low for tape and prefabricated orthotics, moderate for custom-made orthotics
2	Night splints and silicon heel cups	Those with morning pain who are good sleepers	Those who struggle to sleep	Low
3	Extracorporeal shock wave therapy	Those with a heel spur on X-ray	Those who don't quickly respond to initial treatment	Moderate
4	Cortisone injection	Those who have had success with NSAIDs or cortisone injections elsewhere	Those with diabetes; those with thin fat pads or who have had previous injections.	Low-moderate
5	Ultrasound-guided cortisone injection	Those who need diagnostic confirmation	Those with poor pain tolerance (as slower technique under ultrasound)	Moderate
6	Rocker sole shoes	Those with pain in walking	Those who stand or run a lot or have coexisting knee or hip pathology	Low-moderate
7	Platelet-rich plasma injections	Athletes	Those with poor venous access (such as obese patients).	Moderate
8	Botox injections	Possibly those with cavus feet	Athletes or those who walk heavily at work (as side effects of muscle paralysis are poorly studied)	Moderate-high
9	Immobilization	Those who refuse to reduce the loading	Any overweight patient	Low (but high secondary cost)
10	Surgery	Those with longstanding pain who have been unable to unload the heel	Those who have not exhausted conservative treatment	High
Upcoming methods of management				
11	Ozone injections	Those patients who have associated Sinus tarsi syndrome	Not suitable for isolated cases of plantar fasciitis	
12	Ultrasound-guided injection of dextrose prolotherapy	Those patients in which cortisone injections are contraindicated.	Those patients who are tolerant to cortisone injections or have previously taken cortisone injections.	Moderate

NSAIDs: nonsteroidal anti-inflammatory drugs

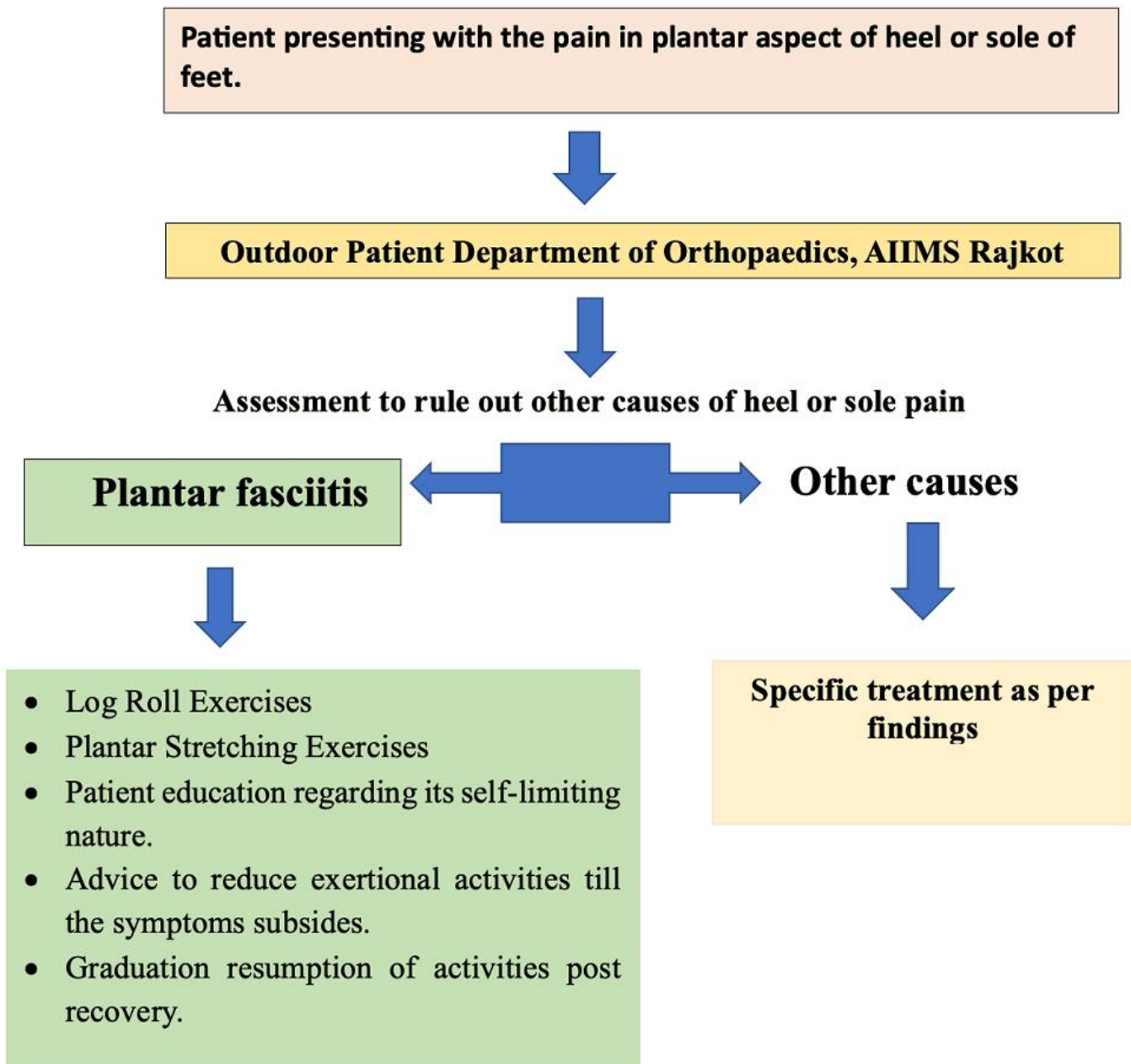


Figure 1: algorithm for screening of patients presenting with pain in plantar aspect of the heel and sole