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Original Article

Orthopaedics Section

Comparative Study of: Non-Invasive Conservative Treatments with Local Steroid Injection in the Management of Planter Fasciitis

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ABSTRACT

Background: Planter Fasciitis is an annoying and painful condition that limits function. There is pain and tenderness in the sole of the foot, mostly under the heel, with standing or walking and is considered a self limiting condition. Symptoms resolve in 80% to 90% of cases within ten months. However, this long interval is frustrating for both patients and clinicians.

Aim: This study was undertaken to compare the two different modalities of non operative treatment: Non- invasive conservative methods: NSAID's, Soft Insoles, Stretching, Ultrasound therapy and Contrast baths versus local Steroid injection therapy.

Material and Methods: Patients by random sampling were divided in two groups. Group A as: Conservative group and Group B as Local Steroid Injections group, 100 patients in each. Patients were assessed as per Visual Analogue Scale (VAS) at the start of treatment and then after 4 wk and 8 wk duration on follow up.

Statistical analysis used: SPSS for Windows (version 10.0) by the Chi-Square test.

Results: The difference in the distribution of subjects belonging to either of the treatment modalities regarding the treatment outcome at four and eight week was found to be statistically insignificant.

Conclusion: As both treatment modalities are at par on comparison of their treatment outcome it is better to go for conservative approach because this can save the patients from the complications of steroid therapy.

Keywords: Orthoses, Planter fasciitis, Steroid Injection, Stretching

INTRODUCTION

Planter Fasciitis is an annoying and painful condition that limits function. There is pain and tenderness in the sole of the foot, mostly under the heel, with standing or walking. There may be an associated tightness of the Achilles tendon. The pain is often worst when first getting up in the morning, with typical hobbling downstairs, or when first getting up from a period of sitting-the typical start up pain and stiffness [1].

The underlying structures of the heel are covered by a highly specialized fat pad whose main function is shock absorption. Its ability results from its unique anatomical configuration in which globules of fat are encapsulated by a fibro elastic reticulated structure. The organization of this tissue is in a U-shaped septum that attaches superficially to the skin and in the deepest layer to the calcaneus. Two distinct force patterns affect the soft tissue of the heel: compression of the heel pad occurs at heel strike, followed by traction on the calcaneus during terminal stance. When only the area over calcaneal tuberosities, where impact is most concentrated, is considered. The pressure increases to 5kg/cm^2, and the pressure is twice as much during running. This area is also the origin of subcalcaneal spurs. There is a relationship between heel pad thickness and elasticity and heel pain in affected populations [2].

Planter Fasciitis is considered a self limited condition. However, the long interval is frustrating for both patients and clinicians. Although, there are numerous reports describing operative and non-operative treatment options that claim to hasten the resolution of symptoms, few entail high level evidence to substantiate their claims. Without high quality data to identify which treatments are successful, the clinical decision making in the management of this condition is at times arbitrary and anecdotal [3].

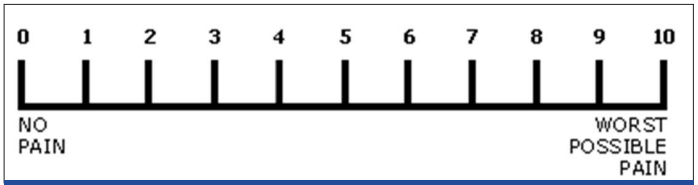
This study was undertaken to compare the two different modalities of non operative treatment: Non- invasive conservative methods versus local Steroid injection therapy.

MATERIALS AND METHODS

A prospective study was done at a Tertiary health care centre after approval from institutional ethical committee in a period of two year from January 2012 till December 2013. Total 200 patients were taken up for the study that completed the follow-up. Patients by random sampling were divided in two groups. Group A as: Conservative group and Group B as Local Steroid Injections group, 100 patients in each. Consent was taken from all patients.

For diagnosis the scientific guidelines as given in Apley's Textbook of Orthopedics [1] were followed which state that diagnosis of planter fasciitis is based on the patients history and on results of the physical examination. In history there is pain and tenderness in the sole of the foot, mostly under the heel, with standing or walking. The condition usually comes on gradually, without any clear incident or injury but sometimes there is a history of sudden increase in sporting activity, or a change of footwear, sports shoes or running surface. Pain is often worst when first getting up in the morning, or when first getting up from period of sitting- the typical start up pain and stiffness. On examination tenderness in the heel on weight bearing and firm pressure with thumb by palpation especially at the medial side of heel were two main criteria for the diagnosis of plantar fasciitis.

Inclusion Criteria: Patients in the age group of 18 to 65 y who fulfilled the above diagnostic criteria were taken up for study.



[Table/Fig-1]: Showing VAS Scale

S N.	Age groups	n (%)
1.	18-24 yrs.	22 (11.0)
2.	25-35 yrs.	65 (32.5)
3.	36-45 yrs.	71 (35.5)
4.	46-55 yrs.	31 (15.5)
5.	56-65 yrs.	11 (05.5)

[Table/Fig-2]: Showing distribution of patients according to their age groups

Treatment	Treatment outcome at 4 weeks			p-value (Chi sq test)
	Excellent n (%)	Good n (%)	Fair n (%)	
Conservative reatment	75 (75)	20 (20)	5 (5)	0.67
Local Steroid Injections	77 (77)	16 (16)	7 (7)	

The difference in the distribution of subjects belonging to either of the treatment modalities regarding the treatment outcome at 4 weeks was found to be statistically insignificant.

[Table/Fig-3]: Comparison of treatment outcome at four weeks between Group A and Group B

Treatment	Treatment outcome at 8 weeks			p-value (Chi sq test)
	Excellent n (%)	Good n (%)	Fair n (%)	
Conservative reatment	80 (80)	19 (19)	1 (1)	0.59
Local Steroid Injections	79 (79)	18 (18)	3 (3)	

The difference in the distribution of subjects belonging to either of the treatment modalities regarding the treatment outcome at 8 weeks was found to be statistically insignificant.

[Table/Fig-4]: Comparison of treatment outcome at eight weeks between Group A and Group B

Exclusion Criteria: Patients of plantar fasciitis in presence of other systemic disease like diabetes mellitus, rheumatoid arthritis, gout etc were excluded from study. Patients with history of trauma, Stress fracture calcaneum, and acute planter fascias rupture cases, patients with neurological pathology, Haglund's deformity cases and flat feet cases. Pregnant women, patient's less than 18 y, and those with history of bleeding disorder or on anti coagulant therapy and cases of bilateral planter fasciitis were also excluded

Patients were assessed as per Visual Analogue Scale [Table/Fig-1] at the start of treatment and then after 4 wk and 8 wk duration on follow up. Results were graded as excellent (0), good (0-30), fair (30-60) and poor (60-100) depending on the VAS score. To begin with only those patients who were rated as very poor (80-100) and there symptom were of more than two week duration were taken up for study.

A lateral X-ray of both heels was taken to demonstrate the presence or absence of a calcaneal spur in painful heel for all cases. Hb%, TLC, DLC, ESR, Random Blood Sugar, Serum Uric Acid, and CRP was done in all cases. BT, CT, PTT, EMG, NCV and MRI were done in some doubtful cases to rule out other pathologies.

Group A- Overall five procedures were combined together that is NSAID's, Soft Insoles, Stretching, Ultrasound therapy and Contrast baths as following: Patients were prescribed Celecoxib 200 mg daily for two week. Soft insoles of Liberty Company were placed in the shoes of males. In females soft rubber sole cushioned footwear's were given. Both male and female patients were instructed not to stand or walk bare feet. Patients were subsequently attended by a qualified physiotherapist who made them to do stretching exercises for planter fascia. They were asked to sit with the knees bent and heel flat on the floor and then to grab all five toes and pull them back toward the knee, hold for 30 sec and repeat five times. They were also advised planter fascia stretches against the wall. Feet was placed against the wall and after gentle leaning forward slowly were asked to hold for 30 sec and repeat the procedure five times. After stretching exercises ultrasound therapy was given in pulsed mode for 15 min in the first week after the application of gel and for 10 min after the application of gel in the second week. Contrast baths therapy was advised at home. Limb to be placed in a hotter bath at 40-42 Centigrade temperature for 3-4 min and then in a colder one at 15-20 Centigrade, for about 1 min alternatively with an instruction: to practice begin and end with the hotter bath.

Group B- Patients were given local steroid injection in the form of 40 mg methyl prednisone mixed with 1ml of 2% lignocaine at weekly intervals up to three injections after subcutaneous sensitivity test of lignocaine in a sterile atmosphere i.e. minor OT after part preparation.

Data Analysis: The data was analysed by using SPSS for Windows (version 10.0) by applying the Chi-Square test and p-values of 0.05 and less were considered as significant.

RESULTS

Total number of patients reached to 276. Out of this 100 patients of each group who completed the follow up were taken for study. Male female ratio in our study was 126/74. Maximum numbers of patients (136) were in the age group of 25 to 45 y [Table/Fig-2] Weight-percentage of patients who were obese was 34%. Duration of heel pain symptoms on average was three week. Number of cases of calcaneus spurs in group A and B was 35 and 39.

The difference in the distribution of subjects belonging to either of the treatment modalities regarding the treatment outcome at four and eight week was found to be statistically insignificant [Table/Fig-3,4].

DISCUSSION

NSAIDS provide temporal relief of inflammation and pain. No clinical trials comparing the use of oral NSAIDS by themselves have been found, only in combination with other therapies such as orthesis and exercise [4], so no evidence for their isolated benefit exists. Donley et al utilized a randomized controlled trial to evaluate the effectiveness of NSAIDs in the treatment of planter fasciitis. 29 patients treated with stretching of the Achilles tendon, viscoelastic heel cups and night splinting were randomly allocated to receive 200 mg of Celecoxib daily or a placebo for thirty days. Although a trend toward increased efficacy was seen the group receiving celecoxib, no statistically significant was detected [5]. Similar to Donley et al we also recommended the use of Celecoxib 200 mg daily.

The aim of orthotic therapy is to reduce strain on the planter fascia by cushioning and elevating the heel and/or providing medial arch support. Orthotics may also be useful for overweight planter fasciitis patients, as they help to reduce shock and cause more even weight distribution over the planter fascia and its insertion on the calcaneus[6]. Many types of shoe inserts have been used to manage planter fasciitis. One RCT showed that magnet embedded insoles were no more effective than placebo insoles in alleviating pain [7]. Another study that compared custom orthotics and prefabricated shoe inserts e.g. silicone heel pad, felt pad, rubber heel cup combined with stretching found that the use of prefabricated insoles plus stretching was significantly more effective than custom orthotics plus stretching [8]. Sharma et al in their study have used UC-BL (University of California Biomechanic Laboratory), shoe insert in cases of planter fasciitis and good results were obtained. It was considered that UC-BL shoe insert should be able to take over, at least in part, the contribution of planter aponeurosis to longitudinal arch stability by holding the foot in a position that relieves tension on the planter fascia and by holding the heel in inversion and by applying

forces against navicular and the outer side of the forefoot, without direct pressure on the soft tissue under the longitudinal arch [9]. As in our study, most of the patients were poor, we recommended cheaper insoles which we found quite soft and durable of a branded company i.e. Liberty.

Stretching of the planter fascia and Achilles tendon is considered to be one of the hallmark treatments in the management of planter fasciitis. The goal of a stretching program is to relieve the stress put on the planter fascia by either the planter fascia itself being tight or the fascia being tightened by a tight Achilles tendon, as both the planter fascia and Achilles tendon insert onto the calcaneus [10]. Di Giovanni et al assessed the role of Achilles tendon stretching versus planter fascia stretching in a randomized study of 101 patients. Both Achilles stretching groups and planter fascia stretching groups appreciated a decrease in pain upon first steps in morning as well as increased function; however, the planter stretchers appreciated a statistically significant improvement in activity function and first step pain as compared to the Achilles stretchers [11]. We noticed that the stretching exercises which we recommended were easy to understand by the patients, further many of them claimed, that because they are like yoga they are quite beneficial for them and they have been doing at home without supervision easily.

Ultrasound is a high frequency sound wave with an affinity for tendons and ligaments. Ultrasound heats these tissues and the tissues absorb the energy, resulting in an increase in tissue temperature and metabolism, tissue softening, and increase in circulation. Ultrasound has also been purported to increase chemical activity in tissues, increase cell membrane permeability, deform molecular structures, and alter diffusion and protein synthesis rates, all potentially affecting the speed of tissue repair [12]. We had to convince our patients that this modality is compulsory and for this reason they underwent this procedure but their constraint was to visit hospital daily.

Although Steroid injection is the mainstay for the management of many hyper inflammatory disorders, there is little known about steroid affect at the cellular level and, consequently, little about the aetiology of the risks of connective tissue rupture after the same [13]. A number of complications were noted including planter fascial rupture, planter fat pad atrophy, lateral planter nerve injury secondary to injection, and calcaneal osteomylities. Fascial rupture and fat pad atrophy are especially serious complications. Fascial rupture interrupts the intrinsic windlass mechanism of the foot and can promote further inflammation in the surrounding tissue, thus promoting pain. In addition planter fat pad atrophy diminishes subcalcaneum cushioning, availing the planter fascia to further insult and, hence, more pain. Because of the recent availability and facility of ultrasound to improve needle placement accuracy in clinical practice, enhanced therapeutic response rates have been reflected in some of the studies. Further limiting the number and frequency of steroid injections and educating patients on reduction of aggressive physical activity during a 2-wk post injection period has been suggested[14]. In our patients apprehension was noted for the adverse effects and also for further increase in pain after local steroid injections.

The limitation of our study is that we have a short term outcome results. Long term benefits, are to be still explored.

CONCLUSION

As both treatment modalities are at par on comparison of their treatment outcome it is better to go for conservative approach because this can save the patients from the complications of steroid therapy.

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