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A comparative study of conventional versus interventional treatment in patients of planter fasciitis

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Abstract

Introduction: Planter fasciitis is one of the most common cause of painful heel in adults. It is very difficult to treat this condition as causation is not exactly diagnosed. It is believed to be partly inflammatory and partly biomechanical. Although there are many treatment modalities for planter fasciitis, there is little consensus on its clinical approach as most of the treatments showed variable outcome. The existing management protocol are mainly from expert opinion derived practical guidelines.

AIM: This study was undertaken to compare the two treatment options in management of planter fasciitis: conventional alone versus interventional (i.e. local steroid injection) along with conventional.

Materials and methods: A total of 60 patients diagnosed as having unilateral planter fasciitis were included in the study. They were allocated in two groups of equal number by randomization. Group A (30 patients) was treated with conventional approach NSAIDs i.e. Tab. Aceclofenac 100mg and Paracetamol 500mg one tablet twice a day along with tab. Pantoprazole 20 mg one tab. twice a day before meals for 4 weeks along with physiotherapy and soft shoe insoles. Group B (30 patients) was treated with local steroid injection, 1ml of Methyl prednisolone (Depomedrol, 40mg/ml) with 1ml of 2% Injection Lignocaine, single infiltration at the site of maximum tenderness along with conventional approach. Pain was assessed according to Visual analogue Scale (VAS) at 1st, 4th, 6th week after initiation of treatment. Any complications if occurred were also recorded. Data was analyzed by SPSS version 18 by applying chi-Square test and P value of 0.05 and less were considered as significant.

Result: Our study showed female preponderance (39/60). Majority of the patients were in age group between 31-45 years. But No significant difference was found according to age wise and gender wise distribution between two groups. Pain was significantly higher ($p > 0.001$) in Group A (conventional approach) as compared to Group B (interventional approach along with conventional) at 1st, 4th, 6th week following treatment.

Conclusion: Interventional treatment (i.e. local steroid injection) along with conventional approach is a better treatment modality than conventional treatment alone.

Keywords: Planter fasciitis, Visual analogue scale, conventional treatment, steroid injection.

Introduction

Planter fasciitis is defined as the traction degeneration of planter fascia at its origin on the heel. It is the most prevalent cause of pain in inferior part of heel. [1] and accounts for 11%-15% of all cases of foot pain for which patient comes to take professional advice and require treatment [2]. Although a higher frequency of planter fasciitis is observed in athletic population, it can also affect sedentary people [3]. The disease is most commonly reported among females aged between 40-60 years [4]. It is usually caused by bone spur or inflammation of the foot connective tissue and typically precipitated by biomechanical stress. There are various extrinsic and intrinsic risk factors which are associated with increased frequency of planter fasciitis in the population. Intrinsic risk factors include obesity, pes planus and shortened achillis tendon. Extrinsic factors include walking on hard surfaces, barefoot, prolonged standing or weight bearing, excessive stretching of planter fascia during exercise or overuse and wearing inappropriate shoes [5].

The classical presentation of planter fasciitis is pain on the sole of foot at the inferior region of heel which is particularly worse with the first step taken on rising the morning and after few steps, the intensity of pain diminishes. The most common local finding is localized tenderness at the inferomedial aspect of calcaneal tuberosity.

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The diagnosis of disease is based on history given by patient and physical examination [6, 7]. Laboratory investigations and diagnostic imaging is usually applied to exclude other causes such as tumour or infection. It is usually a self limited condition, symptoms usually resolve in 80-90 % of patients but its course may last from 6-18 months. Therefore patients seek medical attention to relieve pain [8]. Thus making it a extremely common entity encountered in orthopedic out patient department.

Although numerous treatment options have been used for management of planter fasciitis but there is no definite treatment. Nonsurgical methods include orthoses, stretching, splinting, topical medication with or without iontophoresis, oral nonsteroidal anti-inflammatory drugs (NSAIDs), Extra corporeal shock wave therapy and percutaneous injection with steroid or autologous platelet rich plasma (PRP) [9]. Surgical methods include planter fascia release, USG guided needle fasciotomy, coablation surgery (TOPAZ Procedure). There are numerous reports describing surgical and non surgical treatment options that claims faster resolution of symptoms but still there is no current standards of care and the existing management protocols are mainly from expert opinion derived practical guidelines. Hence the clinical decision making in the management of this condition is at time arbitrary and anecdotal.

The present study therefore was undertaken to compare the two different modalities: conventional treatment alone versus Interventional treatment (local steroid injection) in conjunction with conventional treatment.

Materials and methods

This prospective comparative study was conducted at out patient clinic of orthopedic department of a tertiary care teaching hospital in Southern Rajasthan from Jan.2015 to Dec.2016. The study was commenced after obtaining permission from institutional ethical committee. The patients who were willing for regular follow up for two months and who gave written informed consent to participate in study were enrolled for study.

The inclusion criteria were, patients with age 18years and above, of both sexes with clinically diagnosed cases of unilateral planter fasciitis according to operational definition i.e. pain of less than 3 months duration and without prior proper treatment. Patient with planter fasciitis along with other systemic diseases like diabetes mellitus, rheumatoid arthritis, gout etc., with history of surgery or severe trauma to heel ex. fracture of heel, patients less than 18 years of age, patients with any bleeding disorder or on anti coagulant drugs, patients with bilateral planter fasciitis, patients with heel pain due to other cause such as tumor or infection and patients who were not willing to participate in study were excluded and not enrolled in study.

A total of 60 patients who fulfilled the above mentioned criteria were enrolled in the study. These selected patients were randomly allocated into two groups. For this purpose randomization was done by allocating patients with odd numbers in group A and even numbers in group B. Patients age, sex, occupation, address were entered in pro forma. Patients in group A were managed only by conventional treatment NSAIDs i.e. Tab. Aceclofenc 100mg and Paracetamol 500mg one tablet twice a day along with Tab. Pantaprazole 20mg one tab. twice a day before meals for 4 weeks. The patients in group B were given local steroid injection i.e. methyl prednisolone (inj. Depomedrol 40mg/ml) along with conventional treatment. Under aseptic condition

inj. Depomedrol 1ml and Inj. Xylocaine 2%, 1ml was infiltrated at the site of maximum tenderness. Aseptic dressing was applied. Only one session of infiltration was done. These patients were advised to apply ice on injection site and to avoid strenuous activity involving injection site for at least 48 hours. All the patients in both groups were advised for physiotherapy, to use soft shoe insole, not to walk bare foot along with avoidance of long standing hours.

The visual analogue scale (VAS) was used to describe heel pain on weight bearing. The range of VAS of 1 to 4, 5 to 7, 8 to 10 was considered as mild, moderate, severe pain respectively. In both group VAS was recorded at 1st, 4th, 6th week post therapy. The observer bias was taken care by blinding of observer recording VAS for both groups. The recurrence or increase in pain intensity was assessed at 8th week from starting of treatment. Complication, if any, occurred in any of groups were also recorded. Data was analyzed using SPSS version 18 for applying Chi- Square test and a p value of <0.05 and less was considered statistically significant.

Result

In our study maximum patients were females i.e.(39/60). Gender wise distribution shows that out of 30 patients in group A 12(40%) were male and 18(60%) were female while in group B 9(30%) were male and 21(70%) were female. Gender wise distribution among the group was insignificant with chi square 0.0659 and P value=0.417 (Table-1)

Table 1: Gender wise distribution in both groups

Sex	Group-A (n=30)	Group-B (n=30)	Total (n=60)	p value
Male	12	09	21	0.417(insignificant)
Female	18	21	39	

Maximum number of patients in the present study belonged to age group 31-45 years i.e. (28/60). Age wise distribution among both group was insignificant with chi square 0.297 and P value=0.816 (Table-2)

Table 2: Age wise distribution in both groups

Age range (in years)	Group -A (n=30)	Group -B (n=30)	Total (n=60)	p value
18 – 30	04	05	09	0.8618 (insignificant)
31 – 45	15	13	28	
>46 and above	11	12	23	

Each patient in both groups was evaluated on visual analogue scale (VAS) i.e.(1-4) mild pain, (5-7) moderate pain, (8-10) severe pain to describe pain on weight bearing. (Table-3). After 1st week majority of patients in group A 21(70%) had severe pain 9(30%) had moderate pain and no patient had mild pain. In contrast to group A majority of patients in group B 13 (43.3%) had mild pain, 15(50%) had moderate pain and 2(6.7%) had severe pain. This shows group A patients had highly significant pain as compared to group B patients with chi square 30.2 and P value <0.001.

When pain was observed after 4 weeks, in group A 10(33.3%) had severe pain, 18(60.6%) had moderate pain and 2(6.7%) had mild pain. Whereas in group B no patient had severe pain, 2(6.7%) had moderate pain and 28(93.3%) had mild pain showing that group A patients had significantly high pain as compared to group B patients with chi square 45.33 and P value <0.001.

Finally at 6th week when pain was observed in group A only 4(13.3%) had severe pain, majority of patients 19(63.3%) had moderate pain and 7(23.4) had mild pain. While in group B

the results were same as recorded at 4 weeks but still the pain was highly significant in group A as compared to group B with chi square 30.362 and P value < 0.001

Table 3: Pain assessed by VAS score in both groups at Ist week, IVth week, VIth week

VAS Score	I st week			IV th week			VI th week		
	A	B	Total	A	B	Total	A	B	Total
Mild (1-4)	0	13	13	02	28	30	07	28	35
Moderate (5-7)	09	15	24	18	02	20	19	02	21
Severe (8-10)	21	02	23	10	00	10	04	00	04
Total	30	30	60	30	30	60	30	30	60
Chi square	30.2			45.33			30.36		
p value	< 0.001 (significant)			< 0.001 (significant)			< 0.001 (significant)		

The recurrence of heel pain was significantly higher in group A (17/30 i.e. 56.6%) than that of group B (2/30 i.e. 6.6%) with a chi square 17.33 and P value < 0.001 (Table-4). No patient reported with planter fascia rupture or any other complication.

Table 4: Recurrence (or increase in severity) of heel pain at 8 weeks

Group	Yes	No	Total	Chi square	p value
A	17	13	30	17.330	< 0.001 (Significant)
B	02	28	30		
Total	19	41	60		

Discussion

Planter fasciitis is the most common cause of pain in inferior part of foot and is the cause of more than 15% of presentations due to foot pain. The condition is quite annoying and painful that limits function. Due to malfunction it produces and its high prevalence in all age group, in both gender and in any socioeconomic group this condition and its treatment is always important for orthopaedic surgeons. Several studies have been done about it. Access to the most useful treatment with least complication and decrease in expense is the objective of most studies.

As planter fasciitis is an inflammatory condition, the use of NSAIDs and local steroid injection are both logical and effective treatment options for symptomatic relief. In our study we intended to investigate which would be better treatment option for it NSAIDs alone or in combination with steroid injection in conjunction with conventional supportive measures.

Planter fasciitis is most commonly reported among females between 40-60 years old [7]. In our study we also observed the same finding. Most of the patients of planter fasciitis reported in our out patient department were female in age ranging from 31-60 years yet no significant difference was noted according to sex wise and age wise distribution among two groups. Hussain *et al.* in his study also reported female preponderance with average age of 44.1 years (range 18-58 years) but sex distribution and age distribution among the groups were insignificant [10]. Similarly Biswas *et al.* also reported no significant difference in demographic profile of two groups [11]

According to our finding pain responded dramatically to local corticosteroid injection. It was noted that a single local injection of steroid with local anaesthetic along with NSAIDs causes statistically significant relief in heel pain as compared to oral NSAIDs therapy alone. (p < 0.001). Similarly Akhtar *et al.* conducted a comparative study on conventional versus interventional (local steroid injection) treatment in which he concluded that remission in symptoms by conventional approach were 39.9% while by interventional approach remission in symptoms were 79% [12]. Basit *et al.* also

conducted the similar study and concluded that there are more chances of remission in symptoms of planter fasciitis with steroid injection along with conservative approach as compared to conservative approach alone [13].

Hussain *et al.* also concluded in his work that local steroid injection along with conventional treatment is better than conventional treatment [10]. Crawford *et al.* in his double blind randomized controlled trial on 106 patients with heel pain at rheumatology clinic concluded that statistically significant reduction in pain was detected at one month (p = 0.02) in favor of steroid injection [14]. Biswas *et al.* also concluded from their study that in comparison to oral NSAIDs local steroid injection is a better treatment modality as it causes early, rapid and sustained relief in pain and inflammation in planter fasciitis and is associated with lower recurrence of heel pain. [11]

On the other hand Narula *et al.* compared non invasive conservative method to local steroid injection and found out that both treatment modalities are at par on comparison of their treatment outcome and preferred a conservative approach because it could save patients from complication of steroid therapy [15]. Siavashi *et al.* compared conservative treatment (stretching exercises) to local steroid injection and reported that after 8 weeks of treatment by both therapeutic methods the results were same so he suggested it is better to use less complicated and less expensive methods, stretching exercises seems appropriate and safe method for long term management of the condition as long term steroid injections are not recommended for planter fasciitis. But in cases where prompt relief and better function is desired steroid injection may be better [16].

Andrew Ang *et al.* in his article searched pubmed and Cochrane central register of controlled trials data base and selected ten randomized controlled trials (RCTs) and evaluated them. These RCTs involved use of either USG guided or palpation for corticosteroid injection in patients diagnosed with planter fasciitis. All ten studies reviewed were consistent in showing that corticosteroid injection result in improvement of planter fasciitis from base line. The two high quality controlled placebo trials proved strong evidence of effectiveness of steroid injection in reducing heel pain and planter fascia thickness. Some studies showed that corticosteroid injections yielded better results than other treatment modalities. The effect of corticosteroid injections has been shown to last for up to three months. Complications such as planter fascia rupture were uncommon and physician needs to weigh the treatment benefits against risk [17].

Many studies have proved and mentioned the judicious use of local steroid treatment. NSAIDs mainly act by inhibition of prostaglandin synthesis but they do not suppress the production of other inflammatory markers like cytokines, leukotrienes etc. whereas steroid interfere at several steps in

the inflammatory response but the most important overall mechanism appears to be limitation of recruitment of inflammatory cells at the local site so the action is both direct and local. As steroid is injected locally in treatment of planter fasciitis, chances of systemic side effect are very rare. The potential risk for local steroid injection in treatment of planter fasciitis include local site erythema, planter fascia rupture, heel fat pad atrophy etc. The rupture rate of planter fascia after steroid injection ranged from 2.4% to 6.7% [18, 19]. In an observational study Kim C *et al* reported low incidence of planter fascia rupture in patient after steroid injection for heel pain [18]. Buccilli TJ *et al*. reported a case of abscess formation after local steroid injection in foot [20]. These types of complications were not experienced in our study as we were very careful in injecting local steroid and strict sterilization was ensured during the whole procedure. Simultaneously patients were educated to avoid aggressive physical activity during first 48Hrs or 2 weeks post injection period.

In our study recurrence of heel pain or increase in severity of pain was found to be significantly lower in group taking NAIDs along with steroid injection than that group taking NSAIDs alone ($p < 0.001$) this finding is similar to biswas *et al*. [11]

Newfeld S K *et al*. and Rebecca Cerrito emphasize that 90% of the patients of planter fasciitis of foot respond to non surgical methods of treatment like steroid injection, NSAIDs, and conservative treatment. We have the same outcome in our study by using these modalities.

The limitation of our study is that the follow up period was of 2 months only which is a short follow up period so we have short term outcome result, delayed complications such as planter fascia rupture may be under reported. So long term benefits and delayed complications, are to be still explored

Conclusion

On the basis of this study it can be concluded that patients with planter fasciitis managed by interventional treatment i.e. local steroid injection along with local anaesthetic agent, and conventional treatment (NSAIDs, Shoe insoles and stretching exercises) shows better results as compared to patients managed by conventional approach alone. Interventional treatment require proper technique and strict aseptic measures. Although no complication like planter fascia rupture etc. was experienced they may be associated with long term sequel thus orthopaedician must need to weigh risk and benefits of treatment approaches for each patient individually. However according to the culture of our society and the expectations of patients combining different treatments is more affective in achieving a better outcome.

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