

Article

The Value of Using Local Steroid Injection Vs. Stretching Exercises in Treatment of Plantar Fasciopathy

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Abstract: Objective: to evaluate two methods of treatments; stretching exercises vs. local steroid injection in treatment of plantar fasciopathy. Patients and method: a prospective randomized study of 40 patients complaining from plantar fasciopathy during the period from march 2019 to march 2021. follow up of patient extended for four months after initiation of the treatment, pain was evaluated using VAS (Visual Analogue Score) and P value; which was significant if it is < 0.05 . Results: mean visual analogue scale for steroid injection group (Group S) and stretching exercises (Group E) was 6.42 and 6.32 respectively ($p \text{ value} > 0.05$) at the initiation of the treatment. Mean VAS was 2.25 for Group S and 3.87 for Group E at 4 weeks ($p \text{ value} < 0.05$). At 8 weeks mean VAS was 2.63 for Group S and 3.38 for Group E ($p \text{ value} > 0.05$). Mean VAS was 3.5 and 2.25 for Group S and Group E at 12 weeks after initiation of treatment ($p \text{ value} < 0.05$). Lastly results in this study at 16 weeks showed significant value for Group E with mean VAS of 3 and mean VAS of 4.5 for Group S ($p \text{ value} < 0.05$). Conclusion: A conservative protocol of plantar fascia and Achilles tendon stretching exercises, in conjunction with NSAID administration, constitutes a simple, effective, and non-invasive initial treatment for plantar fasciosis. This approach provides a favorable risk-benefit profile by circumventing the potential complications of local steroid injection.

Keywords: Plantar fasciopathy; corticosteroid injection; stretching exercises; visual analogue scale (VAS); plantar heel pain.

Introduction

Plantar fasciosis is a better term than plantar fasciitis[1], is an inflammatory response resulting from a deterioration of the plantar fascia[2,3]. It accounts for 1000000 patient visits annually in the USA [4]. The most often reported cause of inferior heel discomfort is due to this disease[5,6]. Both athletes and inactive lifestyle persons, especially middle aged persons and older, can develop this illness[7].

The histological characteristics of plantar fasciosis are not well understood, however research has shown that degenerative changes, such as collagen fiber deterioration, increased secretion of protein ground substance, focal areas of fibroblast proliferation, and increased vascularity, predominate at the plantar fascia enthesis[8,9,10,11].

The classic discomfort of plantar fasciosis is found in the medial tubercle of the calcaneus and usually appears after the first few steps in the morning or after an extended period of non-weight

bearing activities. Pain can be lessened by taking more steps or doing minor exercises, but it will return with more weight bearing activities[12,13].

Plantar fasciopathy can be efficiently treated with a mix of conservative treatments, including non-steroid medicines, corticosteroid injections, night splints, phonophoresis, orthotic devices, stretching exercises shoe modifications, and extracorporeal shock-wave therapy [14,15,16,17].

The most typical first therapy consists of painkillers, stretching exercises, and rest. In circumstances when conservative therapy fails, infiltration with intralesional steroids is commonly employed. This technique is typically successful in individuals with acute pain, although it only provides short-term relief[18].

In this study, two methods of treatment is used for treating plantar fasciosis. Local steroid injection and stretching exercise. The objective from this study was to evaluate effectiveness of local steroid injection compared to stretching exercises.

Materials and Methods

A prospective, randomized research with 54 participants was conducted between March 2019 and March 2021. six of them were excluded from the study, while eight others were dropped because they failed to show up for the follow-up test. Following their consent, only forty individuals with plantar fasciitis were added to this trial. Plantar fasciitis discomfort met the criteria for all participants. The patients come to the orthopedic outpatient clinic within a month after the onset of their symptoms. Patients were between the ages of 25 and 55, including 16 men and 24 women. Exclusion was done for:

1. Two sided involvement
2. Operation or injury to the afflicted region.
3. Gestation
4. Systemic disorders that cause plantar fasciopathy.
5. Local bone disease
6. Contraindications for local corticosteroid therapy and NSAIDs.

Individuals in this research were separated into two groups: Group E (Exercises) treated by exercises therapy that stretch the plantar aponeurosis(fascia) and calcaneal tendon(Achilles) tendon as well as NSAID drug. In the other Group S (Steroid), participants got local steroid medication into the maximum uncomfortable location in the heel.

Patients in Group E performed stretching exercises for the plantar aponeurosis and calcaneal tendon and received oral medication(NSAID) in the form of naproxen 250 mg twice a day for 14 days. Individuals involved in this study were taught on how to perform exercises. The troublesome foot is put over the leg of the opposite side while the patient is sitting in a chair. Then the toes are pulled toward the shin to create strain on the foot's plantar aponeurosis. Maintaining this position for ten seconds, repeating this maneuver ten times, and doing it 2 times daily, the patient should feel tightness along the plantar aspect of the foot during this maneuver. Exercises for plantar fascia must be done every day for the first month, then three times each week for the next two months.

To perform stretching exercise of calcaneal tendon, patients instructed to do it through adopting a standing position on a stair, with the plantar surface of the forefoot (ball of the foot) positioned on the step's edge. The upper limbs maintain contact with a handrail for postural balance. Then, the subject performs a slow, controlled descent of the heels via ankle dorsiflexion, maintaining the stretch at a point of subjective tension without pain, hold this position for 6 seconds, then return to the starting position. The exercise protocol consisted of three daily sessions. Each session comprised 3 sets of 10 repetitions. During each repetition, the stretch was held for 6 seconds, resulting in a total load time of 3 minutes per session. The exercise protocol sustained daily for the initial 12 weeks of the study.

Participants in Group S were given a local steroid injection. Using a 22 gauge needle and under aseptic method, injection of 40 mg of methylprednisolone and 1 ml of 2% lidocaine was administered to the most painful portion of the heel through the medial side of the foot distal to the calcaneum. In

addition to the steroid injection, patients in Group S received the same standardized course of oral naproxen 250 mg twice daily for 14 days as described for Group E. It is recommended that patients refrain from heavy exercise for one week.

Subjects in this study instructed not to be barefoot or walk for an extended periods. The visual analogue score (VAS), a 0-10 cm scale (0 represents no pain and 10 represents the worst anguish imaginable), is utilized to evaluate pain after properly explaining how to use it .

Pain is assessed in the first examination and again at 28 days, 8 weeks, 12 weeks, and 16 weeks. Statistics were considered significant at p-value <0.05.

Results

The mean age of the forty individuals in this research was 44. The two groups had mean ages of 43 years(Group E) and 44.5 years(Group S), the difference was statistically insignificant (p value>0.05). Weight differences between the two groups were statistically insignificant(p value >0.05). 24 female (60%) were present, with 13 in Group E and 11 in Group S. 16 males (40%) were present, with 7 in the stretching exercises group and nine in the other group.

22 (55%) of participants had heel pain on the right side, compared to 18 (45%) on the left.

Local steroid injection(Group S) and stretching exercises group(Group E) had mean VAS values of 6.42 and 6.32, respectively, which were statistically insignificant (P value > 0.05) before initiation of treatment.

A decline in mean pain score in both groups was achieved, but more in the local steroid injection(Group S), as measured by the mean VAS value at 4weeks after initiation of therapy, which was 2.25 for Group S and 3.87 for exercises group , which was statistically significant(p value<0.05).

Mean VAS was 2.63 for Group S and 3.38 for Group E at the 8 weeks follow-up, which was statistically insignificant (p value>0.05). At 12 weeks, the VAS mean value showed that Group S had 3.5 score and Group E 2.25 which was statistically significant (p value < 0.05).At the 4- month showed follow-up examination, the mean VAS score for Group E showed favorable results. The score for Group E was 3 and 4.5 for Group S(p value <0.05), which was statistically significant (Table.1).

Table.1-Mean VAS Scores at Baseline and Follow-up Time Points

	Baseline	4 weeks	8 weeks	12 weeks	16 weeks
Steroid Group	6.42	2.25	2.63	3.5	4.5
Exercise Group	6.32	3.87	3.38	2.25	3
P value	>0.05	<0.05	>0.05	<0.05	<0.05

Discussion

In clinical practice, early conservative treatment has positive results in around eighty to ninety percent of patients[19,20,21,22].

The findings of this study showed that steroid injection plus NSAID was more effective in the first four weeks, despite the fact that stretching exercises plus NSAID reduced discomfort significantly. Follow-up examinations at 8 weeks show that both Group S and Group E are equally effective , however at 12 and 16 weeks, Group E outperforms Group S .

A study done in 2006 found that stretching the calcaneal tendon is more beneficial than other techniques in a clinical trial with sixty-six patients and a two-year follow-up. The results revealed that ninety- two percent of the patients were pleased with this treatment, and seventy-seven percent had no difficulty or constraint in practicing stretching exercises. They determined that plantar fascia stretching is more successful and less costly than alternative treatment options[23].

another article study demonstrated that patients with this illness underwent stretching exercises of plantar aponeurosis and joint mobilization for 21 days has been shown to yield pain and functional improvement that extend for one year following treatment[24].

in another study, they investigated the effects of injection of steroid in patients with this disease. In this study, a bone scan was utilized to identify heel discomfort and follow up of the patients. Twenty-four patients were recruited, eight of them had bilateral involvement (total thirty two feet). Pain was totally or almost completely relieved after the injection in twenty feet. The remaining twelve feet demonstrated short-term or no pain relief[25].

Injection with steroid medications are commonly employed to treat this disease, and there is some evidence that steroid can provide temporary pain relief[26]. The immediate effects of steroid injection on pain motivate doctors to use it often in the treatment of this condition, especially in athletes need to return to action rapidly. However, current scientific research indicates that injection of steroid medication should not be utilized in athletes due to the increased risk of inducing spontaneous plantar fascia tear[27].

Atrophy of fat pad and rupture of heel plantar fascia are serious problems, but they are rare[28]. one of the studies discovered prolonged symptoms in individuals with rupture of the plantar fascia owing to steroid injection, and not all patients were healed from this problem[29].

Conclusion

A conservative protocol of plantar fascia and Achilles tendon stretching exercises, in conjunction with NSAID administration, constitutes a simple, effective, and non-invasive initial treatment for plantar fasciosis. This approach provides a favorable risk-benefit profile by circumventing the potential complications of local steroid injection.

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