



Comparative Study of 30 Cases of Local Injection of Autologous Blood and Corticosteroids in Treatment of Plantar Fasciitis

Authors

Bhupinder Singh Brar, Satbir Singh, Amandeep Singh Bakshi, Daljinder Singh, Ashish Garg, Karan Alawadhi

Department of Orthopaedics,
Government Medical College, Patiala, Punjab, India 147001

Abstract

Introduction: *Plantar fasciitis is a painful heel condition associated with Obesity, Poor foot alignment, Prolonged Standing, Fat pad atrophy causing significant distress in day to day activities. The objective of the current study was to evaluate and compare the treatment outcomes and complications of local injection of steroid derivatives and autologous blood in the management of plantar fasciitis.*

Material and Methods: *This randomized, interventional study was conducted on OPD basis on 60 patients suffering from plantar fasciitis. Patients were divided into two groups, Total 30 patients in each group (group-I steroid group, group-II autologous blood group). Point of maximum tenderness at anteromedial tuberosity of calcaneum was identified and injected under aseptic precautions using peppering technique.*

Results: *Patients were followed up at regular intervals (2 weeks, 6 weeks, 3 months and 6 months) for pain severity (VAS score), Functional outcome (RM score), any complications, recurrence of symptoms, requirement of analgesics and physiotherapy. Results were analysed statistically using chi-square test and student's t-test.*

Conclusion: *Autologous Blood Injection significantly reduces the pain without any complications. Autologous blood is easy to acquire and prepare, provides intermediate and long term results in term of pain relief in comparison to corticosteroid injection which gives short term relief with comparatively high recurrence rate. Autologous blood is easy to procure and administer than PRP also (Platelet Rich Plasma procurement requires much more cost and patient compliance). Thus, highly useful for economically under developed and developing countries.*

Keywords: *Plantar fasciitis, Autologous blood injection, Corticosteroid injection.*

Introduction

Plantar Fasciitis is a common problem encountered in Orthopaedic practice. Plantar fasciitis is a painful condition of the plantar fascia. Pain is experienced primarily on the plantar surface of the foot at the anteromedial aspect of the calcaneum tuberosity.^[1] with proximal radiation in more

severe cases. It is worst when getting out of bed in the morning or after sitting for a long time and precipitated by prolonged standing or increase in weight bearing activities.^[2] The disease is actually a degenerative process with or without inflammatory changes, including fibroblastic proliferation. This has been proven from biopsies

of fascia from people undergoing surgery for plantar fascia release.^[3]

A survey of US professional football, baseball, and basketball team physicians and trainers found that plantar fasciitis was among the 5 most common foot and ankle injuries observed in professional athletes.^[4] Tong and Furiareorted that more than 2 million patients are treated for plantar fasciitis every year and estimated cost of treatment in 2007 as ranging from \$192 to \$376 million.^[5]

The most commonly used name "Fascitis" was questioned over time, as histological studies failed to show inflammatory cells (macrophages, lymphocytes and neutrophils) in the affected tissue. Although the diagnosis of lateral tendinosis is quite straight forward, there has been no consensus on the optimal management strategy. Plantar fasciitis is a self-limited condition, and studies have reported a resolution incidence of up to 90% with nonsurgical measures.^[6] However, it can often last for several weeks or months, because tendons heal slowly. In some cases, it can persist for more than a year. Different treatment approaches exist with different mechanisms of action and include- Rest, NSAID'S, Bracing, Physical therapy, Extracorporeal shock wave therapy, Ultrasound therapy, Local Steroid injections aimed at arresting the inflammatory cascade (once considered the gold standard but now controversial), Surgery.^[7]

In Recent studies injection of autologous blood has been reported to be effective for the treatment of Plantar Fasciitis. It is hypothesized that autologous blood works by providing mitogens such as platelet derived growth factors that induce fibroblastic mitosis, chemotactic polypeptides such as transforming growth factor and specific humoral mediators promote the healing cascade by triggering stem cell recruitment, increasing local vascularity and directly stimulating the production of collagen by tendon sheath fibroblasts. The mechanism of action of autologous blood and its concentrated extract, platelet rich plasma is attributed to degranulation of α granules of platelets releasing growth factors

which play a role in tissue healing and regeneration.^[8] The activation of the platelets occur through the exposure of platelets to the thrombin, which is released from the tendon tissue during injection.

The objective of the current study was to evaluate and compare the treatment outcomes and complications of local injection of steroid derivatives and autologous blood in the management of plantar fasciitis.

Material and Methods

A randomized, interventional study was carried out using two treatment modalities [local steroid injections and autologous blood injections] with supervised physical therapy programme for the management of 30 patients in each group (group-I steroid group, group-II autologous blood group) having plantar fasciitis, presenting to outpatient department in our institute.

Patients Selection

Inclusion Criteria

1. Patients with age 18 years or older and consenting to study.
2. Untreated cases of plantar fasciitis, for which no other cause could be identified.

Exclusion Criteria

1. A history of substantial trauma.
2. Previously treated by surgery for plantar fasciitis
3. Other causes of heel pain to be ruled out.

In Group I, 0.5 ml of triamcinolone acetonide mixed with 2 ml of 1% lignocaine hydrochloride^[9] was used and injected at anteromedial plantar aspect of calcaneal tuberosity under aseptic precautions using peppering technique. In Group II, 1.5 ml of venous blood was drawn from the vein of ipsilateral hand/cubital fossa and was injected after mixing with 1 ml of 2% lignocaine hydrochloride solution.^[9]

The evaluation of the patients was carried out by the severity of the pain and the amount of disability in the pre injection phase, and at subsequent outpatient visits at 2 weeks, 6 weeks, 3

months and 6 months. The degree of pain was assessed by employing the Visual Analogue scale (VAS) and the degree of disability was evaluated by Roles and Maudsley score (RMS).^[10] Patients were also followed up at regular intervals for any complications, recurrence of symptoms, requirement of analgesics and physiotherapy. Results were analysed statistically using chi-square test and student's t-test.

Results

The two Groups were comparable before injections with respect to Gender, Mean age, laterality of disease, mean Body Mass Index (BMI), Mean duration of symptoms, Occupation and Mean VAS score.(Table 1).

Out of the 60 participants, 20 (33.3%) were male patients and 40(66.6%) were female patients. Study of Gupta et al^[11] (70%) and Modi et al^[12] (59%) also had more number of female patients. In our study, the mean age encountered was 43.8 years (Range: 20 to 79 years); the peak incidence was seen in 4th decade of life. This was seen similar in separate studies. Gupta et al^[11] observed mean age to be 42 years. Abdihakin et al^[13], Di Giovanni et al^[14], Shoaib et al^[15] observed mean age in 4th decade.

In our study 78.3% cases were over-weight or obese with BMI more than 25. In corticosteroid injection group, Mean BMI was 27.6 while In autologous blood injection group, Mean BMI was 28.46 (p value = 0.47). Similar studies conducted by Modi et al.^[12], Abdihakin et al^[13] and Ball et al^[16] favoured obesity and over-weight as a predisposing factor .

Pre-injection Mean VAS score for two groups was 7.60 and 7.33 respectively (p value 0.225, not significant, hence comparable)(Table 2). At 2 weeks, The mean VAS score was 4 and 5.66 respectively (p value 0.048, statistically significant). This means that at 2 weeks corticosteroid injection group had better effect in decreasing the VAS pain score as compared to autologous blood injection group. At 6 months, The mean VAS score was 3.11 and 1.75

respectively (p value 0.046, statistically significant). This implies definitely significant clinical improvement in VAS pain score in autologous blood group at 6 months than corticosteroids. Our study co relates with the study conducted by Kiter et al^[17], Modi et al^[12], Gupta et al^[11] which also favour long term beneficial effects of autologous blood injection.

In our study, The Roles Maudsley Score (Table 3) for both groups was evaluated at 6 weeks, 3 months and 6 months. 2 patients in group 1 and 1 patient in group 2 left study after 3 months. At 2 weeks, there was significant improvement in corticosteroid injection group with 33.3% of patients completely relieved of pain while patients completely relieved of pain in autologous blood injection group were nil. At end of 6 months, 15 (50%) patients in corticosteroid injection group and 21 (70%) patients in autologous blood injection group were completely relieved of pain. In a study of Barrett et al^[18] showed 66% patients with complete relief at 2 months and more than 85% with complete relief at 1 year follow up.

In corticosteroid group, 6 patients (20%) reported recurrence at 6 months follow up while no recurrence was reported with autologous blood injection.(Table 4)

In our study, 6 patients (20%) had local skin erythema in corticosteroid injection group while only 1 patient (3.33%) in autologous blood injection group had this problem (p value=0.044, which is significant). (Table 5) Thus, corticosteroid group has more complication rate than autologous blood group. No patient was found to have fat atrophy, infections or rupture of the plantar fascia. Studies of Molloy et al^[19], Gidumal et al^[20], Buccilli et al^[21] reports serious complications after corticosteroid injection.

Discussion

More number of female patients in these studies may be due to fact that females are more involved with household work which causes repetitive stress. Also the disease has predilection for obese people. The disease peaks in 4th decade of life

which is most productive part of a persons lifetime.

we conclude that although corticosteroid injection initially showed reduction in pain score at 2 weeks(p value=0.048) and 6 weeks(p value=0.704) but gradually its effect fades off while that of autologous blood injection shows continued improvement in pain score even upto 6 months(p value=0.046) that outweighs the short term benefits with corticosteroid group. A possible explanation for the long-lasting effect of autologous could be that platelets improve the early neotendon properties so that the cells are able to perceive and respond to mechanical loading at an early time. The corticosteroid group was actually better initially and then declined, whereas the blood group progressively improved. 70% patients in autologous blood injection group were completely relieved of pain at end of study. Complete relief implies a person with no rest pain, no pain on routine activities and on exertion. An 'excellent' or 'good' score was considered to be a successful outcome.

Treatment with corticosteroids has a high frequency of recurrence, probably because intratendinous injection may lead to permanent adverse changes within the structure of the tendon and because patients tend to overuse the limb after injection as a result of direct pain relief. Number of patients requiring repeat injections was also more in corticosteroid injection group. This study offers encouraging results of an alternative treatment that addresses the pathophysiology of plantar fasciitis that has failed traditional nonsurgical modalities.

Corticosteroid injection has more complication rate than autologous blood injection. Literature reports fat pad atrophy, infections and rupture of planter fascia with steroid injections. Autologous blood is quite safe as per adverse effect profile is concerned, also no chance of blood reactions seen with transfusion of donor blood, as patients own blood is used for injection.

Conclusion

Autologous blood injection technique for plantar fasciitis offers a better treatment

- 1) its application is minimally traumatic
- 2) it has a reduced risk for immune-mediated rejection, devoid of potential complications such as Skin Erythema/Swelling, skin atrophy, Recurrences and tendon tears associated with corticosteroid injection
- 3) it is simple to acquire and prepare, easy to carry out as outpatient procedure
- 4) it is inexpensive
- 5) better relief of pain
- 6) low recurrence rate.

Autologous blood is easy to procure and administer than PRP also (PRP procurement requires much more cost and is time consuming). Thus, highly useful for economically under developed and developing countries.

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