Comparative Prospective Study Between Platelet Rich Plasma and Steroid Injection in Treatment of Chronic Planter Fasciitis

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Abstract

Purpose: Compare the results of injection of steroid and PRP in cases of chronic plantar fasciitis

INTRODUCTION: plantar fasciitis can be a difficult condition to treat. Results of platelet rich plasma (PRP) injection have been promising. We compared PRP to cortisone injection in the treatment of chronic plantar fasciitis resistant to conservative management.

METHODS: 38 heels (20 heels in the steroid group and 18 heels in the PRP group) with plantar fasciitis failed conservative treatment were included to receive either PRP or Steroid injection. All patients were assessed by Visual Analogue Score (VAS) for pain, at 2 weeks 1 month and 3 months post injection.

RESULTS: Our study included 38 patients; 20 in the steroid arm and 18 had PRP injections. The average age of the steroid injection group was 43.1±9.7 years and in the PRP was 43.1±8.4 years (P= 0.698).

The starting average pain scores were 8.6 for both groups (P= 0.712). Then our patients were followed up clinically at 2 weeks, 1 month and 3 months following the injections. There was statistically significant lower VAS scores for the steroid injection group at all follow up visits (P< 0.001 in all follow ups). The average pain scores were 4.9 and 6.7 at 2 weeks follow up for the steroid injection versus the PRP respectively, it was 2 and 4.2 at 1 month and last 0.6 and 1.2 after 3 months respectively.

CONCLUSIONS: This study demonstrates that both steroid and PRP injections are highly effective in treatment of chronic plantar fasciitis but improvement in pain was more rapid with steroid injection. This study recommends for follow up for a longer period than three months to compare long term benefits of steroids and PRP.

Introduction

Chronic plantar fasciitis is a common problem that affects sport participants as well as inactive middle-aged individuals [6, 19]. In general, the condition is self-limiting, and the majority of cases spontaneously resolve regardless of type of intervention received (including placebo) [4]. Increasing knowledge of the pathology has led to the widespread application of a large number of conservative treatments for recalcitrant plantar fasciitis [16], including physiotherapy, plantar-fascia-stretching exercises [8], icepacks, night splints, prefabricated and custom-made insert, shoe modification, nonsteroidal anti-inflammatory drugs (NSAIDs) and extracorporeal shock-wave therapy (ESWT) when conventional physical therapy is not effective [23]. Although the effect of ESWT remains controversial, reliable evidence supports the use of this approach for treating chronic...
plantar fasciitis [12, 18]. However, adverse effects such as pain during treatment, soft-tissue damage (bleeding, hematoma, paresthesia), nausea, the need for peripheral nerve block and costs should be considered when proposing this procedure [26]. Recently, promising results were reported with the use of platelet-rich plasma (PRP) injections for treating muscle and tendon injuries and degeneration [9–13, 15, 21]. The rationale for using PRP is to increase tendon regenerative abilities with a high content of cytokines and cells, in hyperphysiologic doses, which should promote cellular chemotaxis, matrix synthesis, and proliferation [20]. Degranulation of the alpha granules in platelets releases many different growth factors that can play a role in tissue regeneration processes. PRP represents a treatment option for many foot and ankle pathologies, including tendinopathy (Achilles, peroneal, posterior tibial, flexor hallucis longus, anterior tibial) and chronic ligamentous injury, such as plantar fasciitis.

The purpose of this study was to assess the safety of PRP injections for treating chronic plantar fasciitis and provide initial clinical assessment of its effectiveness.

Material and methods
38 consecutive patients (25 women, 13 men; mean age 43.2 ± 8.8 years) admitted to our hospital in 2016 were enrolled in this study. All patients gave informed consent to participate in the study, which was carried out in sohag university hospital. Patients were included if they were ≥18 years, experienced heel pain felt maximally over the plantar aspect for at least six months continuously. Patients were treated in the prior three months with conservative therapies, such as icepacks, stretching of the Achilles tendon and NSAID medication, which provided inadequate improvement of pain and functionality. Exclusion criteria included generalised inflammatory arthritis, including ankylosing spondylitis, rheumatoid arthritis or psoriatic arthritis; any wound or skin lesion at the plantar aspect of the foot; pregnancy; severe infection; known malignancy; previous surgery, ESWT or corticosteroid injection into the heel, including Achilles tendon; nerve-related symptoms such as radiculopathy, tarsal tunnel syndrome or tarsi sinus syndrome; foot and ankle osteoarthritis.

Ten millilitres of autologous blood was taken from the antecubital vein with the outer syringe and placed into the Arthrex Centrifuge and centrifuged for five minutes at 1,500 rpm. During the extracorporeal blood processing, 2 ml of anticoagulant citrate dextrose solution was used to prevent clotting. The system allows supernatant (PRP) transfer from the 10-ml outer syringe into the 5-ml syringe under aseptic conditions. All patients received one injection at the plantar fascia injection was performed by one of the authors (SC) on an outpatient basis. The injection point was at the origin of the plantar fascia on the medial tubercle of the calcaneus, as described by Cyriax and Cyriax [5]. The origin of the plantar fascia was approached from the medial side of the foot but near the plantar surface. After injection, all patients were allowed to immediately walk but were advised to avoid weight-bearing sport activities, such as running or jumping, for at least four weeks after the last injection. After PRP injection, patients remained in the outpatient clinic until pain was considered tolerable and were followed in the outpatient clinic at 2 weeks 1 month and three months intervals or by telephone interview to detect possible side effects. NSAIDs were prescribed
for no more than three days after injection, and ice packs were allowed for postinjection pain. Physiotherapy treatments were not prescribed during recovery from the injections. Before treatment and during the follow-up visit, patients were asked to rate their pain on a visual analogue scale (VAS), with zero indicating no pain and ten the worst pain imaginable. [14, 24] was used to define the outcome of the procedure. Treatment was considered successful when the patient had an excellent or good score. Patients were examined clinically at 2 weeks after the index procedure. Data were analyzed using SPSS 13.0 (SPSS Inc., Chicago, IL, USA), with a paired t-test after checking normal distribution of samples with the Kolmogorov–Smirnoff z test. The level of significance was considered as \( p < 0.0 \)

**Results**

Our study included 38 patients; 20 in the steroid arm and 18 had PRP injections. The average age of the steroid injection group was 43.1±9.7 years and in the PRP was 43.1±8.4 years (\( P = 0.698 \)). There were 13 males and 25 females. The steroid injection group had 7 males and 13 females while the PRP group had 6 males and 12 females as shown in table 4.

Eleven right feet were injected in both the steroid and the PRP groups and 9 and 7 left feet were injected by steroid and PRP respectively as shown in table5.

Pain was assessed using VAS. The starting average pain scores were 8.6 for both groups (\( P = 0.712 \)). Then our patients were followed up clinically at 2 weeks, 1 month and 3 months following the injections.

There was statistically significant lower VAS scores for the steroid injection group at all follow up visits (\( P < 0.001 \) in all follow ups). After 2 weeks of injection. The average pain scores were 4.9 and 6.7 for the steroid injection versus the PRP respectively, it was 2 and 4.2 at 1 month and last 0.6 and 1.2 after 3 months.

**Discussion**

Our results confirmed by results of Say et al. (2014) who found a positive effect on pain and functional scores in the steroid group which can be explained by the anti-inflammatory effect. However, steroid injections have been reported to be related to plantar fascia tear, fat pad atrophy, abscess, and osteomyelitis (Buccilli et al. 2005). They concluded that he PRP group had significantly higher mean VAS scores at follow-up than the steroid group (\( p < 0.001 \)) which was similar to our results (Say et al. 2014). Also Yaratapalli et al. (2015) found that in the PRP and corticosteroid injection groups at the initial visit had VAS of 6.85 and 6.95 respectively. On injection of PRP and corticosteroid in respective groups, 4 weeks evaluation of VAS showed a significant decrease in corticosteroid group as compared to PRP group. At the end of 8 weeks the VAS decreased significantly in corticosteroid group compared to PRP.
At the end of 3 months, the VAS decreased significantly in corticosteroid group as compared to PRP group. At the end of 6 months, the PRP group showed significant reduction in VAS compared to corticosteroid group. This shows that corticosteroid is more effective for short term relief and PRP is more effective for long term relief (Yaratapalli et al. 2015).

Similar to our results, Lee and Ahmad. (2007) conducted prospective randomised, controlled study of 64 patients for a period of 6 months by comparing PRP with corticosteroid injection. The authors found that there is significant reduction in VAS for both the groups over a time. At 6 weeks and 3 months, the corticosteroid group had significantly lower VAS than the PRP group, but the difference was not significant at 6 months but in our study, we found a significant reduction in VAS score at 2 weeks, 1 months and 3 months with corticosteroid group.

Also Homayouni et al. (2016) study revealed that local injection of PRP furnishes consequential relief of pain and improvement in function that is comparable to the corticosteroid injection to treat PF. Corticosteroid injection in PF, when conservative management is unsuccessful, is an effective treatment (Genc et al. 2005, Porter and Shadbolt. 2005). But some authors concluded that corticosteroid injection can give short-term relief and seems to be useful only to a small degree apparently, since intrafascial injection may lead to permanent adverse changes within the fascial structure and since patients tend to overuse the foot after injection as a result of direct pain alleviation, fascial rupture is the side effect of repeated corticosteroids injections (Kim et al. 2010).


24. Wang CJ, Chen HS, Huang TW. Shockwave therapy for patients with plantar fasciitis: a one-year follow-up


31. Hogan KA, Webb D, Shereff M. Endoscopic plantar fascia release. Foot Ankle