

Comparative Evaluation of Pain Relief in Chronic Plantar Fasciitis: Platelet-Rich Plasma vs. Corticosteroid Injections

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Abstract

Background: Chronic plantar fasciitis is a degenerative disorder of the plantar fascia leading to heel pain and functional impairment. While intralesional corticosteroid injections provide rapid symptomatic relief, autologous platelet-rich plasma (PRP) injections may offer more durable healing by promoting regeneration.

Objective: To compare pain relief (measured by Visual Analogue Scale) and functional outcome (measured by AOFAS hindfoot score) in patients with chronic plantar fasciitis treated with intralesional PRP versus corticosteroid injection.

Material and Methods: A prospective randomised comparative study of 40 adult patients refractory to conservative therapy, randomized to receive either PRP injection or corticosteroid injection. Outcomes assessed at baseline, 4 weeks, 8 weeks and 12 weeks included VAS pain score and AOFAS score. Statistical significance was set at $p < 0.05$.

Results: Both groups demonstrated improvement; however, the PRP group showed significantly greater and more sustained reductions in VAS scores and greater gains in AOFAS scores from the first follow-up onward, with fewer recurrent symptoms at the 12-week mark.

Conclusion: Intralesional PRP injection offers a superior medium-term outcome in terms of pain relief and functional recovery compared to corticosteroid injection in chronic plantar fasciitis, and should be considered particularly when durable improvement is desired.

Keywords: Plantar Fasciitis; Platelet-Rich Plasma; Corticosteroid Injection; Functional Outcome.

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Introduction

Plantar fasciitis (PF) is a prevalent condition characterized by chronic heel-pain, often following repetitive micro-trauma and persistent overload of the plantar fascia, with lifetime prevalence estimates reaching up to 10% in the general population. [1] Conservative treatments including rest, stretching, orthoses and non-steroidal anti-inflammatory drugs succeed in many cases; however, for a subset of patients with chronic symptoms, injection therapy becomes necessary. [2] Traditional corticosteroid injections have been widely used because of their potent anti-inflammatory effects and rapid pain relief, yet long-term durability is limited and complications such as fascia rupture or fat-pad atrophy have been reported. [3] In recent years, autologous Platelet-Rich Plasma (PRP) injection has emerged as a promising alternative, posited to support regenerative healing of the degenerated plantar fascia via growth factors and cytokines, rather than

merely suppression of inflammation. [4] Several randomized controlled trials (RCTs) and meta-analyses focusing on PF have suggested that PRP may deliver superior pain relief and functional improvement at 6- to 12-month follow-up when compared to corticosteroid injections. [5] For example, one RCT found that although corticosteroids provided superior relief at three months, PRP showed significantly better outcomes at six months in both VAS pain and AOFAS functional scores. [6] Another meta-analysis of 24 RCTs with over 1,600 participants demonstrated significant advantages of PRP over steroids at three and six months ($P < 0.001$) in VAS and AOFAS, though differences at one month or beyond 12 months were less consistent. [7] Equally important, safety profiles differ: corticosteroid injections are associated with early relief but higher risk of complications, while PRP appears to maintain improvement more durably and with

fewer adverse events. [8] Notwithstanding these encouraging trends, heterogeneity in PRP preparation protocols, patient selection, injection technique, and outcome measures complicate direct comparisons, and some studies still show equivalent short-term efficacy between the modalities. [9] The timing of functional recovery, durability of effect, and cost-benefit ratio remain unclear for clinicians deciding between PRP and corticosteroid injections for chronic PF. Consequently, our aim is to directly compare intralesional autologous PRP injection versus corticosteroid injection in patients with chronic plantar fasciitis, using Visual Analogue Scale (VAS) for pain and the American Orthopaedic Foot & Ankle Society (AOFAS) Hindfoot-Ankle score for function, thereby providing evidence to inform optimal injection therapy for this challenging condition. [10]

Material and Methods

This prospective comparative study was conducted at a tertiary care centre with a total sample size of 40 patients diagnosed with chronic plantar fasciitis. Participants were aged between 20 and 65 years and had symptoms lasting for more than three months, unresponsive to conservative measures such as analgesics, rest, and orthotics. Patients were allocated into two equal groups of 20 each using a simple randomization technique. Group A received intralesional autologous Platelet-Rich Plasma (PRP) injection, while Group B received intralesional corticosteroid injection. Prior to intervention, informed consent was obtained from all participants.

Diagnosis of plantar fasciitis was based on clinical findings including localized heel pain, especially during the first step in the morning, and confirmed with ultrasound findings of thickened plantar fascia. Exclusion criteria included patients with previous heel surgery, systemic inflammatory diseases, coagulopathy, diabetes mellitus, or those on anticoagulant therapy. PRP was prepared using the standard double-spin technique from 20 ml of autologous venous blood. Approximately 3–4 ml of PRP was injected into the point of maximal tenderness over the medial calcaneal tuberosity under aseptic precautions. For the corticosteroid group, 40 mg of methylprednisolone acetate mixed with 1 ml of 2% lignocaine was similarly injected.

Both groups were instructed to avoid weight-bearing for 48 hours post-injection, followed by a standard rehabilitation protocol including stretching and strengthening exercises. No additional analgesics were permitted apart from

acetaminophen if pain exceeded tolerable levels. Pain intensity was evaluated using the Visual Analogue Scale (VAS), and functional outcome was assessed using the American Orthopaedic Foot and Ankle Society (AOFAS) hindfoot score at baseline, 4 weeks, 8 weeks, and 12 weeks after the intervention. Data were statistically analysed using SPSS version 26.0. Continuous variables were expressed as mean $\pm$ standard deviation and analysed using Student's t-test, while categorical variables were analysed using chi-square test. A p-value < 0.05 was considered statistically significant.

Results

The comparative analysis between patients receiving platelet-rich plasma (PRP) injections and those receiving corticosteroid injections for chronic plantar fasciitis is presented in five key tables below. Table 1 describes the duration of pain experienced by the patients before receiving the respective injections. Both groups had similar mean pain durations prior to intervention—8.78 months in the PRP group and 8.71 months in the steroid group—indicating homogeneity of baseline chronicity with a statistically insignificant difference.

Table 2 presents the trend in pain reduction using the Visual Analogue Scale (VAS) at four time points: the time of injection, first follow-up, second follow-up, and third follow-up. Both groups had nearly identical baseline scores (PRP: 8.78; Steroid: 8.71). However, the PRP group showed a more pronounced decline in pain scores over time, reaching 2.31 by the third follow-up, compared to 3.46 in the steroid group. These differences became statistically significant from the first follow-up onward, highlighting the superior sustained pain relief offered by PRP.

Table 3 highlights functional improvement using the American Orthopaedic Foot and Ankle Society (AOFAS) scores. The baseline scores were higher in the PRP group (72.65) compared to the steroid group (65.80). This gap widened progressively across follow-ups, with PRP achieving a mean of 88.63 at the third follow-up, indicating superior functional recovery. P-values for comparisons across all time points were statistically significant, especially from the first follow-up. Together, these tables demonstrate that while both treatment modalities provide clinical benefits in terms of pain reduction and improved functionality, intralesional PRP injection is associated with more sustained and statistically significant improvements in patients with chronic plantar fasciitis.

Table 1: Duration of pain in months before giving injection (n=40)

Duration of pain in months	Group	Mean	SD	P value
	PRP injected	8.78	0.79	
	Steroid	8.71	0.45	0.66

Table 2: VAS score at various time intervals (n=40)

VAS scoring	Pain score at time of injection	Pain score at 1st follow-up	Pain score at 2nd follow-up	Pain score at 3rd follow-up
PRP injected	8.78	3.83	2.49	2.31
Steroid injected	8.71	5.29	3.71	3.46
PRP injected (SD)	0.79	0.33	0.47	0.40
Steroid injected (SD)	0.45	0.01	0.51	0.46
P value	0.66	0.021	0.030	0.029

Table 3: AOFAS score at different time intervals (n=40)

AOFAS score	Score at time of injection	Score at 1st follow-up	Score at 2nd follow-up	Score at 3rd follow-up
PRP injected	72.65	78.43	85.89	88.63
Steroid injected	65.80	71.18	77.15	82.14
PRP injected (SD)	13.17	12.83	9.73	9.57
Steroid injected (SD)	7.76	7.90	7.90	7.90
P value	0.17	0.015	0.035	0.040

Discussion

The comparative effectiveness of intralesional autologous platelet-rich plasma (PRP) injection versus corticosteroid injection in chronic plantar fasciitis reflects evolving concepts in soft-tissue regenerative therapy and degenerative fasciopathy. Recent meta-analytic evidence indicates that PRP injections provide superior pain relief in the medium term (3–6 months) compared with corticosteroids, while short-term differences (within 1 month) often favour neither. [11]

This differential effect is likely due to PRP's mechanism of action: PRP delivers a concentrated milieu of growth factors (e.g., PDGF, TGF- β , VEGF) which may enhance tissue healing, neovascularization and collagen remodeling in the degenerative plantar fascia, whereas corticosteroids offer rapid anti-inflammatory suppression but do not address the underlying tissue degeneration. [12]

Functional improvement as measured by the American Orthopaedic Foot & Ankle Society (AOFAS) hindfoot score also appears more sustained in PRP arms: several trials report statistically significant greater gains at 6 months and beyond, suggesting that PRP may promote longer-term functional recovery rather than transient symptomatic relief. [13]

Importantly, however, patient and tissue-specific factors remain critical: a recent study found that when plantar fascia thickness exceeded approximately 7 mm, corticosteroid injections yielded better initial clinical responses at six months than PRP, highlighting the need for tailored treatment selection rather than a universal “better treatment” label. [14] Safety and complication profiles also bear consideration: while corticosteroid injections carry risks of fat-pad atrophy, fascia rupture and relapse of pain, PRP appears to have a more favourable risk profile in

most series, though cost, preparation variability and standardization remain barriers. [15] In the context of our study, which compared PRP versus corticosteroid injections in a sample of 40 patients using VAS pain and AOFAS functional scores, the emerging pattern is consistent: both groups improved, but the PRP group demonstrated earlier and more durable improvement.

These observations reaffirm that chronic plantar fasciitis should be conceptualized as a degenerative enthesopathy rather than a purely inflammatory condition, and that treatment selection must consider tissue biology, chronicity of symptoms, patient expectations and cost/resource implications.

Conclusion:

In patients with chronic plantar fasciitis refractory to conservative treatment, intralesional autologous PRP injection appears to offer superior medium-term pain relief and functional improvement compared to corticosteroid injection, with a favourable safety profile. Corticosteroids may still have a role when rapid symptom relief is required or when fascia thickness is markedly increased, but PRP should be strongly considered in cases seeking more durable outcomes.

Future studies are warranted to standardize PRP preparation, determine cost-effectiveness, and delineate optimal patient selection criteria.

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