

A Prospective Study of the Effectiveness of Autologous Platelet - Rich Plasma Injection in Chronic Plantar Fasciitis

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Abstract: *Plantar fasciitis is a prevalent tendinopathy leading to heel pain, often managed conservatively. However, recent advancements include utilizing local Platelet Rich Plasma (PRP) injections, offering autologous and growth factor - rich benefits. This study aims to assess the efficacy of PRP injections in chronic plantar fasciitis.*

Keywords: platelet Rich plasma (PRP); chronic plantar fasciitis

1. Introduction

A prevalent cause of heel discomfort, plantar fasciitis is characterized by chronic deterioration around the origin of the plantar fascia and typically affects adults in their 50s and 60s. Orthoses, splints, NSAIDs, and stretching are examples of traditional therapy; corticosteroid injections provide short - term respite. They don't, however, offer long - term recovery. For tendon injuries, autologous PRP has emerged as a viable treatment option since it contains growth factors and higher platelet concentrations. The purpose of this study is to assess PRP injections' efficacy in treating persistent plantar fasciitis.

2. Materials and Methods

Conducted between September 2020 and March 2022 at Narayana Medical College and Hospital, Nellore, this study

recruited 30 patients diagnosed with chronic plantar fasciitis. Inclusion criteria comprised adults over 18 years with a minimum three - month history of plantar fasciitis, failed conservative treatments, and a numerical pain score above 7. Exclusion criteria included recent steroid injections, local infections, rheumatoid arthritis, and pregnancy. PRP was prepared through double centrifugation of 10 ml venous blood collected in anticoagulant tubes.

Patients who had received a local steroid injection within the past three months, exhibited signs of infection or ulceration at the injection site, had rheumatoid arthritis, or were pregnant were not included in the study.

Preparation of Platelet Rich Plasma (PRP) involved collecting 10 ml of venous blood from the antecubital vein into tubes containing sterile sodium citrate as an anticoagulant. Double centrifugation was performed to prepare PRP.



The initial centrifugation, termed a 'soft spin,' was conducted at 3000 rpm for 3 minutes, resulting in the separation of blood into layers including red blood cells (RBC), buffy coat, platelets, and platelet - poor plasma. The upper layer containing plasma, platelets, and buffy coat was transferred to

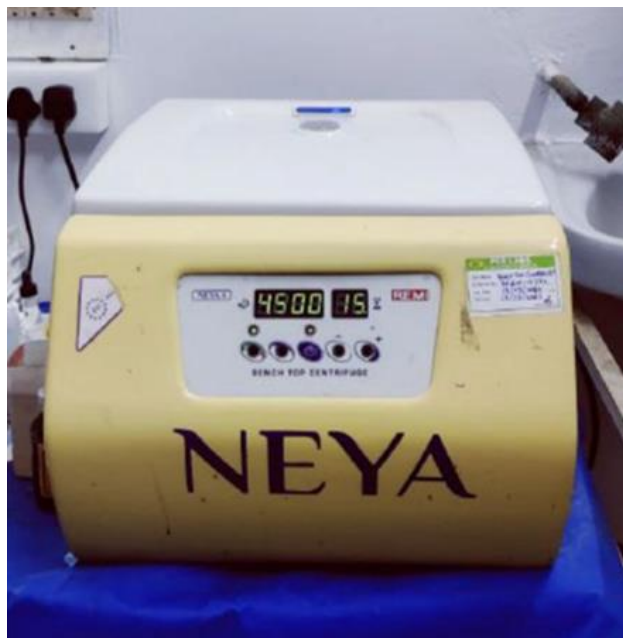
another syringe using a three - way connector. This mixture underwent a second centrifugation, known as a 'hard spin,' at 4500 rpm for 15 minutes, leading to the separation of platelets and platelet - poor plasma. The supernatant plasma was

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discarded, and the platelets were resuspended in an appropriate volume of either plasma or normal saline.

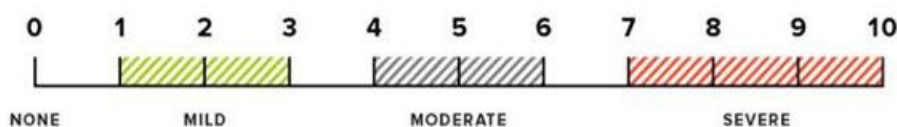


Initially, bupivacaine is administered into the skin and subcutaneous tissue of both groups as a local field block. Additionally, about 0.05ml of bupivacaine is directly injected into the area of greatest tenderness. Subsequently, 3ml of platelet concentrate is injected into the plantar fasciitis using a 22 - gauge needle and a peppering technique. This method entails making a single skin portal followed by five penetrations of the fascia.

Post - Procedure Protocol and Follow - up procedure: Following the injection, the patient remains seated without moving the foot for 15 minutes. Patients are advised to restrict foot use for approximately 48 hours and refrain from taking nonsteroidal medication.

Patients were monitored for six months with follow - up appointments scheduled at 1, 3, and 6 months. Pain assessment was conducted subjectively using the Numerical Pain Score, where patients rated their pain intensity on a scale from 0 to 10. Pain intensity was categorized as mild (scores 0 - 3), moderate (scores 4 - 6), or severe (scores 7 - 10), based on the Numerical Pain Score.

0-10 NUMERIC PAIN RATING SCALE



3. Results and Analysis

Percentage Reduction of Pain in Plantar Fasciitis:

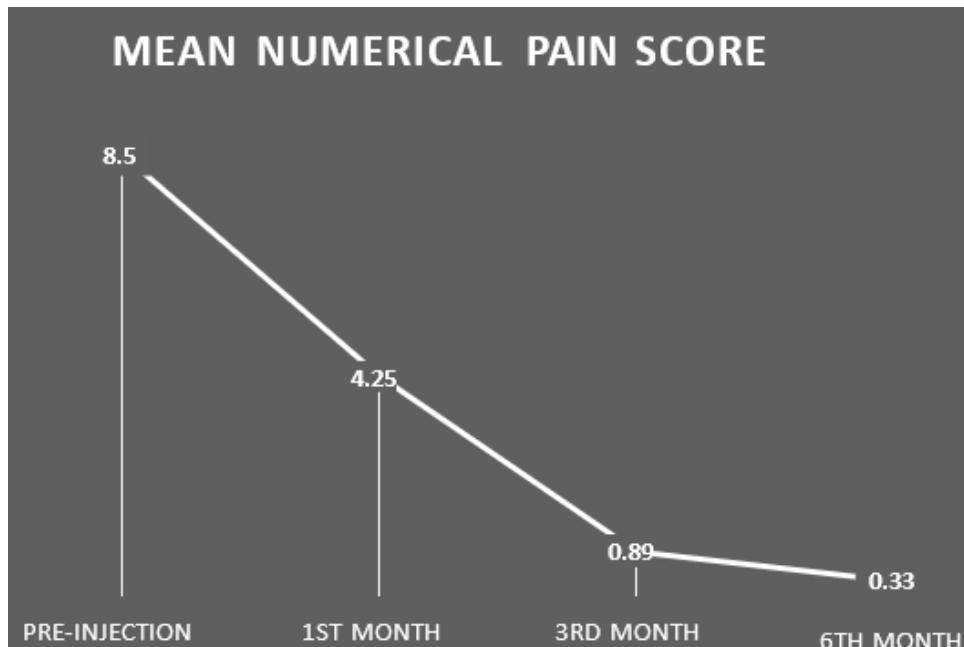
Pain relief	100% relief		50 - 99% relief		<50% relief		0% relief	
	No.	%	No.	%	No.	%	No.	%
1 st month	7	23.33	13	43.33	6	20	4	13.33
3 rd month	11	36.6	12	40	4	13.30	3	10
6 th month	15	50	11	36.6	2	6.66	2	6.66

- **1 Month:** 100% pain relief was observed in 7 patients (23.3%), 50 - 99% relief in 13 patients (43.33%), less than

50% relief in 6 patients (20%), and no relief in 4 patients (13.33%).

- **3rd Month:** 100% pain relief was noted in 11 patients (36.6%), 50 - 99% relief in 12 patients (40%), less than 50% relief in 4 patients (13.3%), and no relief in 3 patients (10%).
- **6th Month:** 100% pain relief was seen in 15 patients (50%), 50 - 99% relief in 11 patients (36.6%), less than 50% relief in 2 patients (6.66%), and no relief in 2 patients (6.66%).

Mean Numerical Pain Score:



- At the time of injection, the mean numerical pain score was 8.5 for all patients with plantar fasciitis. Subsequently, at 0, 1, 3, and 6 months, the mean scores were 8.5, 4.25, 0.89, and 0.33 respectively.
- Patients experienced maximum symptom relief at the 3rd month, which was sustained until the 6th month.

4. Discussion

- Plantar fasciitis, characterized by heel pain, is commonly treated with NSAIDs and non - drug approaches initially. Steroid injections, though popular, provide short - term relief with a high relapse rate.
- Platelet - rich plasma (PRP) injections have shown promise in providing significant and sustained pain relief due to the growth factors present in platelets.
- Various techniques, including the peppering technique, have been employed for PRP injection administration, showing effectiveness in treating conditions like lateral epicondylitis and plantar fasciitis.
- Studies have demonstrated the safety and efficacy of PRP injections in treating plantar fasciitis, with maximum relief observed after the 3rd month and sustained improvement until the 6th month.

5. Conclusion

Intralesional autologous platelet - rich plasma injections are safe and effective in treating chronic plantar fasciitis, with maximum effectiveness observed after the 3rd month and sustained relief until the 6th month.

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