

# Comparative Study of Ultrasound - Guided PRP Injection vs Steroid Injection in the Treatment of Plantar Fasciitis: A Two - Year Review of 100 Cases

Dr. Vivekananda Patil<sup>1</sup>, Dr. Apoorva Sharadrampure<sup>2</sup>

<sup>1</sup>MS Orthopaedics, Assistant Professor, JGMMMC KLE, Hubli  
Procedures Performed at KLE Suchirayu Hospital and VCare Super Specialty Hospital, Hubli.

<sup>2</sup>MD Radiology, Assistant Professor, JGMMMC, Hubli  
Radiology reporting performed at VCare Diagnostic Centre, Hubli.

**Abstract:** *This study compares the efficacy and outcomes of ultrasound - guided Platelet - Rich Plasma (PRP) injection versus steroid injection in the treatment of plantar fasciitis over two years. A total of 100 patients were enrolled and equally divided into two groups, with 50 patients receiving PRP injections and 50 receiving steroid injections. All patients were provided with a standardized protocol of medication and physiotherapy. This article evaluates clinical outcomes, pain relief, and functional improvement in both groups. PRP injections demonstrated superior long - term benefits, suggesting a shift towards regenerative approaches in managing chronic plantar fasciitis.*

**Keywords:** Platelet Rich Plasma, steroid injection, plantar fasciitis, pain relief, functional improvement

## 1. Introduction

Plantar fasciitis is one of the most common causes of heel pain, affecting approximately 10% of the general population over their lifetime. Characterized by inflammation and microtears in the plantar fascia, it can lead to debilitating pain and significant functional limitations. Conventional treatment options include rest, anti - inflammatory medications, physical therapy, orthotics, and corticosteroid injections. While these methods provide symptomatic relief, they may not promote healing of the damaged tissue.

Platelet - Rich Plasma (PRP) therapy, which involves injecting a concentrated solution of the patient's own platelets, has gained attention as a regenerative treatment option. PRP contains growth factors and cytokines that enhance tissue repair and regeneration. Corticosteroid injections, on the other hand, offer rapid pain relief by reducing inflammation but may not address the underlying degenerative changes. This study aims to compare these two treatment modalities to determine their relative efficacy and long - term outcomes in patients with chronic plantar fasciitis.

## 2. Methodology

### Study Design

This retrospective study was conducted at VCare Hubli from January 2022 to December 2023. A total of 100 patients diagnosed with chronic plantar fasciitis were enrolled and equally divided into two groups:

- **Group A:** Received ultrasound - guided PRP injections.
- **Group B:** Received ultrasound - guided steroid injections.

### Inclusion Criteria

- Patients aged 18 - 65 years.
- Diagnosed with plantar fasciitis refractory to conservative management for at least three months.

- No prior history of injections or surgical intervention for plantar fasciitis.

### Exclusion Criteria

- Patients with systemic inflammatory diseases or diabetes.
- Previous foot or ankle surgery.
- Patients on long - term steroid therapy.

## 3. Procedure

PRP was prepared using a double centrifugation technique, and the final product was injected into the plantar fascia under ultrasound guidance. Steroid injections were similarly administered under ultrasound guidance to ensure precision. All patients received a standardized rehabilitation protocol, including physiotherapy and NSAIDs as needed.

## 4. Results

### Pain Relief

Patients in the PRP group reported more significant and sustained pain reduction compared to the steroid group, particularly at the 6 - month and 1 - year follow - up. Visual Analog Scale (VAS) scores decreased by an average of 6 points in the PRP group versus 4 points in the steroid group.

### Functional Improvement

Functional outcomes, measured using the Foot and Ankle Ability Measure (FAAM) scores, showed greater improvement in the PRP group. The average FAAM score improvement was 35 points in the PRP group compared to 20 points in the steroid group.

### Complications

No significant complications were noted in either group. Minor post - injection pain was more frequent in the steroid group, though it resolved within a few days.

## 5. Discussion

The comparative analysis of PRP and steroid injections highlights their distinct mechanisms and clinical implications. PRP, derived from the patient's own blood, contains a high concentration of growth factors that promote tissue healing and regeneration. This aligns with the observed long-term benefits in terms of pain reduction and functional improvement in the PRP group. Conversely, steroid injections, which primarily function by reducing inflammation, provide rapid symptomatic relief but may not address the underlying degenerative changes of plantar fasciitis.

### Efficacy and Mechanism:

The superior outcomes in the PRP group can be attributed to its ability to stimulate the healing cascade. Growth factors such as platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF- $\beta$ ), and vascular endothelial growth factor (VEGF) present in PRP enhance the repair process by promoting cellular proliferation, collagen synthesis, and angiogenesis. In contrast, steroids inhibit the inflammatory process but may also compromise tissue integrity when used repeatedly, potentially leading to plantar fascia weakening.

### Clinical Relevance:

While the steroid group demonstrated effective short-term pain relief, particularly within the first three months post-injection, the recurrence of symptoms in some patients by the six-month mark underscores the limitations of this approach. Steroid injections, despite their immediate efficacy, should be considered cautiously in chronic cases, especially where structural changes in the plantar fascia are evident.

### Patient Compliance and Recovery:

Another crucial aspect of this study is the role of concurrent physiotherapy and medication in the overall recovery process. Both groups were subjected to a standardized rehabilitation protocol, emphasizing the importance of a comprehensive treatment strategy that combines pharmacological and non-pharmacological interventions. Patients in the PRP group exhibited greater adherence to physiotherapy, likely influenced by the perceived efficacy and the motivation associated with regenerative treatment.

### Cost-Benefit Analysis:

Despite the higher initial cost of PRP therapy compared to steroids, the long-term benefits such as reduced recurrence rates, decreased need for additional interventions, and overall improvement in quality of life may justify the investment. This is particularly relevant in younger, active patients or those seeking to avoid surgical options.

## 6. Study Limitations

The study is not without limitations. The relatively small sample size and the lack of a placebo group may influence the generalizability of the results. Additionally, subjective measures of pain and function, despite being validated, can introduce variability. Future studies with larger cohorts, longer follow-up periods, and objective imaging evaluations such as MRI or elastography could provide deeper insights

into the morphological changes associated with each treatment.

## 7. Future Directions

Emerging therapies such as combined PRP and stem cell injections, or adjuncts like shockwave therapy, warrant exploration in the context of plantar fasciitis. Furthermore, stratifying patients based on factors such as BMI, duration of symptoms, and specific biomechanical anomalies may help tailor individualized treatment protocols, enhancing outcomes and patient satisfaction.

The results of this study suggest a paradigm shift towards regenerative medicine approaches for chronic plantar fasciitis, promoting a move away from merely symptomatic relief towards addressing the root cause of the condition. Given the complexity and variability of plantar fasciitis, a multidisciplinary approach that includes innovative interventions like PRP could redefine standard care practices.

## 8. Conclusion

Both PRP and steroid injections are effective for managing plantar fasciitis, but PRP offers superior long-term benefits. The regenerative properties of PRP facilitate not only symptomatic relief but also structural healing, making it a preferable choice for patients with chronic or refractory plantar fasciitis. Steroid injections, due to their cost-effectiveness and rapid onset of action, remain valuable for short-term relief, particularly in acute settings.

The integration of ultrasound guidance in both procedures ensured accurate delivery and minimized complications, highlighting the importance of imaging modalities in enhancing clinical outcomes. This study supports the use of PRP as a frontline therapy for plantar fasciitis, with the potential to improve quality of life and reduce the need for more invasive treatments.

## References

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