

Efficacy of Steroid Injections and Percutaneous Fasciotomy in Treating Plantar Fasciitis: A Retrospective Cohort Study

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Abstract

Background: Plantar fasciitis is a common musculoskeletal disorder and one of the most frequent causes of chronic pain in the heel in adults. If conservative treatment is ineffective, interventions can be done like corticosteroid injections or percutaneous fasciotomy. But there is slight comparative evidence of the effectiveness of these treatment modalities

Methods: This was a retrospective cohort study carried out at Patna Medical College and Hospital (PMCH), Patna, Bihar, India. The medical records were reviewed for the 31 patients who were treated from May 2025 to December 2025. 16 patients were treated with corticosteroid injections, and 15 patients with percutaneous fasciotomy. The severity of pain was evaluated by a Visual Analog Scale (VAS), and secondary outcomes were functional improvement, recurrence and complications.

Results: The pain scores decreased significantly in both treatment groups after intervention. The steroid injection group had a mean VAS score of 8.2, which was reduced to 3.4, while the fasciotomy group had a mean VAS score of 8.4, which was reduced to 2.1. The patients who received percutaneous fasciotomy experienced more pain relief, improved functional results and fewer recurrences than the steroid injection group. There were a few complications in either group.

Conclusion: The results are the same for both treatment options and indicate that both are effective in treating plantar fasciitis, though percutaneous fasciotomy may be more effective for patients with persistent or refractory symptoms.

Keywords: Plantar Fasciitis, Corticosteroid Injection, Percutaneous Fasciotomy, Heel Pain, Visual Analog Scale.

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Introduction

Inflammation and degeneration of the plantar fascia, a thick band of connective tissue from the calcaneus to the toes, is one of the most frequent causes of heel pain, known as plantar fasciitis [1]. It is usually found to affect the plantar surface of the heel, and is most painful when first taking steps in the morning or after a period of rest. Some factors are known to increase the risk of developing plantar fasciitis, including repetitive microtrauma, excessive mechanical stress, obesity, prolonged standing and biomechanical abnormalities [2,3]. It is usually self-limited, but when symptoms continue, it can make mobility difficult and have a negative impact on life quality. Based on epidemiological studies, plantar fasciitis is one of the most common musculoskeletal diseases of the

foot, occurring in around 10% of the population at some stage of their lives [4,5]. It tends to occur more in middle-aged adults, sportsmen, runners and people who are engaged in work and standing for extended periods or walking. Plantar fasciitis has a high socioeconomic cost, including direct healthcare costs, lost productivity at work, and restricted activities [6]. Persistent heel pain can reduce activity, thus causing more health issues and a poor quality of life [7]. Different treatment options have been used for treating plantar fasciitis. The first-line treatment generally involves conservative measures such as rest, exercise and rehabilitation, use of orthotics, anti-inflammatory drugs and modifying activity [8]. Most patients respond to conservative therapy and do not

continue to have symptoms, but a small number are unresponsive to treatment and have persistent pain [9]. However, for refractory cases, corticosteroid injections are frequently used due to their strong anti-inflammatory properties and quick pain relief. But there are still issues to be addressed, such as risk of recurrence and development of complications like fat pad atrophy and plantar fascia rupture [10]. When non-operative treatments have not been effective, surgical procedures are usually specified. Of these, percutaneous fasciotomy has gained attention as a minimally invasive treatment that allows for the plantar fascia to be released without excessive soft tissue damage or recovery time [11].

Although corticosteroid injections and percutaneous fasciotomy are common procedures, there is limited evidence that specifically compares the effectiveness of these procedures, especially in the Indian healthcare environment. The majority of the studies available are from the Western population and may not be representative of the demographic, occupational, and clinical characteristics observed in Indian patients. In addition, there is limited institutional information on treatment outcomes in routine clinical practice. This retrospective cohort study was therefore conducted to compare the efficacy of steroid injection and percutaneous fasciotomy in patients with plantar fasciitis, and to provide regional evidence in the existing literature.

Objectives

Primary Objective

- To compare the functional outcomes between patients treated with steroid injections and those treated with percutaneous fasciotomy.

Secondary Objectives

- To assess pain relief following steroid injections.
- To evaluate pain reduction following percutaneous fasciotomy.
- To evaluate complication and recurrence rates associated with both treatments.

Materials and Methods

Study Design: To compare the effectiveness of corticosteroid injection vs percutaneous fasciotomy for the treatment of plantar fasciitis in a retrospective cohort study. A retrospective design was selected because the outcomes of the treatments could be evaluated in the clinical records of patients who had already received interventions. The present work aimed to evaluate the efficacy of both treatment modalities in reducing pain, improving function, patient satisfaction, recurrence and complications.

Study Setting: The study was conducted in the Department of Physical Medicine and Rehabilitation, Patna Medical College and Hospital (PMCH), Patna, Bihar, India. The institution serves a large number of patients from Patna and the adjoining areas of Bihar, it is a proper place to compare the clinical results of the common treatment modalities used in the treatment of plantar fasciitis.

Study Duration: The study had patients' medical records available for analysis from May 2025 to December 2025. Hospital records stored during the study period were used for retrospective data collection and analysis.

Sample Size: A total of 31 patients with plantar fasciitis met the inclusion criteria and were included in this study. The patients were divided into two groups according to the treatment they received. 16 patients received local corticosteroid injection treatment, and 15 patients received minimally invasive surgical treatment (percutaneous fasciotomy). The results of these two groups were compared to determine the effectiveness of each intervention.

Inclusion Criteria: Inclusion criteria were age of 18 years or more and diagnosis of plantar fasciitis. Patients with chronic symptoms for more than 6 months after conservative treatment were only included if symptoms did not resolve. Conservative management consisted of rest, stretching exercises, physiotherapy, orthotic support and non-steroidal anti-inflammatory drugs. Also, only patients who had complete and easily accessible medical records were analysed.

Exclusion Criteria: Patients with previous surgery of the heel or a history of foot fracture, and those with systemic disease (e.g. rheumatoid arthritis), which might affect treatment outcome, were excluded. Patients who had neurological problems that affected their gait or lower extremity function were also excluded. Clinical data were not analysed for cases with incomplete clinical records or those where follow-up data were missing.

Data Collection: Data were collected from hospital records with a structured data collection form, and patient information was extracted. Demographic data included age, gender and Body Mass Index (BMI). Clinical variables were duration of symptoms, affected side and baseline pain score. Information related to treatment comprised corticosteroid injection administration and percutaneous fasciotomy procedure. Follow-up records were observed for treatment outcomes and any adverse events reported.

Outcome Measures: Pain severity was the main outcome measure, measured with a VAS. Changes in VAS scores before and after treatment were used

to evaluate treatment effectiveness. Secondary outcomes were functional improvement in activities of daily living, patient satisfaction with treatment, recurrence of symptoms in follow-up and complications related to either intervention.

Statistical Analysis: The data were analysed with the SPSS software program. Continuous variables were measured as mean $\pm$ SD, and categorical variables as frequencies and percentages. Continuous variables were compared between the groups using independent t-tests, and changes within the groups were compared using paired t-tests. For categorical data, chi-square tests were used. A p-value of < 0.05 was considered to be statistically significant.

Ethical Considerations: The study was approved by the institutional ethics committee of PMCH before actually gathering data. A retrospective cohort study, and there was no direct involvement

of patients. The anonymity and confidentiality of the patients were preserved in all aspects of the research, and the data were analysed for academic and scientific purposes only.

Results

Baseline Characteristics: The study involved 31 patients who had a diagnosis of plantar fasciitis. There were 16 patients in the steroid injection group and 15 in the percutaneous fasciotomy group.

The mean age of the patients in the steroid group was 44.8 ± 8.3 years, and 46.2 ± 7.9 years in the fasciotomy group. There was a slightly higher proportion of females in both groups. No statistically significant differences between the mean BMI were found in the groups, nor between baseline demographic characteristics ($p > 0.05$).

Table 1: Demographic Profile of Participants

Variable	Steroid Group (n=16)	Fasciotomy Group (n=15)	p-value
Age (years), Mean $\pm$ SD	44.8 ± 8.3	46.2 ± 7.9	0.621
Male, n (%)	6 (37.5)	5 (33.3)	0.807
Female, n (%)	10 (62.5)	10 (66.7)	0.807
BMI (kg/m ²), Mean $\pm$ SD	28.1 ± 3.4	28.7 ± 3.1	0.594

Clinical Characteristics: The average duration of symptoms prior to intervention was 8.4 ± 2.1 months in the steroid group and 8.9 ± 2.5 months in the fasciotomy group. The VAS was used to

measure baseline pain severity, which was similar in both groups, indicating comparable disease severity before treatment.

Table 2: Disease Characteristics

Variable	Steroid Group	Fasciotomy Group
Symptom Duration (months), Mean $\pm$ SD	8.4 ± 2.1	8.9 ± 2.5
Baseline VAS Score, Mean $\pm$ SD	8.2 ± 0.9	8.4 ± 0.8

Pain Outcomes: A large decrease in pain score was observed in both treatment groups at follow-up. The mean VAS score decreased from 8.2 to 3.4 in the steroid injection group, and from 8.4 to 2.1 in

the fasciotomy group. The overall improvement was greater in the group in which patients had undergone percutaneous fasciotomy.

Table 3: VAS Scores Before and After Treatment

Group	Baseline VAS	Follow-up VAS	Improvement
Steroid Injection	8.2 ± 0.9	3.4 ± 1.2	4.8
Percutaneous Fasciotomy	8.4 ± 0.8	2.1 ± 0.9	6.3

A statistically significant difference between the two groups in the reduction of VAS scores after treatment, with the fasciotomy group showing the highest decrease, suggesting better pain relief after treatment.

Functional Outcomes: The functional outcomes were evaluated, and there was a greater percentage of excellent and good outcomes in the group of patients undergoing percutaneous fasciotomy. The number of fair outcomes, however, was higher in the steroid injection group.

Table 4: Functional Outcomes Following Treatment

Outcome	Steroid Group n (%)	Fasciotomy Group n (%)
Excellent	5 (31.3)	8 (53.3)
Good	7 (43.7)	5 (33.3)
Fair	3 (18.7)	2 (13.4)
Poor	1 (6.3)	0 (0.0)

Complications and Recurrence: Complications were infrequent in both treatment groups. Patients who had steroid injections had a higher frequency

of recurrence of symptoms. A superficial wound infection occurred in one patient in the fasciotomy group and was successfully treated conservatively.

Table 5: Complications and Recurrence

Variable	Steroid Group n (%)	Fasciotomy Group n (%)
Recurrence	3 (18.7)	1 (6.7)
Infection	0 (0.0)	1 (6.7)
Persistent Pain	2 (12.5)	1 (6.7)

In general, both therapies had the beneficial effect of decreasing pain and enhancing function among patients suffering from plantar fasciitis. Nevertheless, there was a higher pain reduction, better functional results, and a lower recurrence rate in the percutaneous fasciotomy group than in the corticosteroid injection group.

Discussion

In this study, the efficacy of corticosteroid injections and percutaneous fasciotomy for plantar fasciitis was evaluated and compared. The results of both interventions were significant decreases in pain and increases in function. In contrast, patients treated with Percutaneous fasciotomy had greater improvement in VAS scores, a higher rate of excellent functional outcomes and a lower rate of recurrence compared with those treated with steroid injection. The results indicate that both treatments work, but percutaneous fasciotomy could offer a longer-lasting symptom relief for chronic plantar fasciitis.

Comparison with Previous Studies: The results of the present study agree with those of [12], who showed that corticosteroid injection is effective in the short term for the treatment of plantar fasciitis. [13] also reported significant symptom improvements after injection treatments, with some patients having symptoms return. In the current study, the increased pain reduction after percutaneous fasciotomy supports the findings of [14], who concluded that surgical release procedures were effective for patients who were refractory to conservative treatment. In addition, [15] found that the long-term results of minimally invasive plantar fascia release were better, which further strengthens the better functional results observed in the fasciotomy group in this study. Other published studies also indicate that surgical procedures may be helpful in cases that are nonresponsive to injection therapy, but that

injection therapy is beneficial for immediate symptom control.

Clinical Significance: The results of this study have important clinical implications for the management of plantar fasciitis. Significant pain relief in both treatment groups led to better mobility and functioning in these patients. Patients with persistent symptoms may benefit from using percutaneous fasciotomy for the superior functional outcomes, which can help inform treatment decisions. The decision for treatment depends on the duration of symptoms, severity of symptoms, the patient's preference, and whether the patient has responded to previous conservative treatments.

Advantages of Steroid Injections: Because of their minimally invasive nature, ease of delivery and relatively low cost, corticosteroid injection is still a valuable therapeutic option. They are effective in reducing pain quickly and can be done without hospitalization. Steroids may therefore be especially helpful for patients seeking immediate relief for symptoms or for those who are unsuitable candidates for surgical intervention.

Advantages of Percutaneous Fasciotomy: The advantage of percutaneous fasciotomy includes the following, particularly for patients with chronic or refractory plantar fasciitis. It is a minimally invasive, low-tissue dissection technique and has a shorter recovery time than standard open surgery. The results of this study indicated that the long-term therapeutic results of percutaneous fasciotomy are superior, with greater pain relief and lower recurrence rates, which may be related to more sustained therapeutic effects.

Limitations

Several limitations should be considered when interpreting the findings of this study. First, only 31 patients were studied, so the results might not be widely applicable. Second, the study was conducted at a single tertiary care center which

may limit external validity. Third, the study is retrospective, so selection and information bias may have occurred. Finally, the duration of follow-up was limited, and very long-term outcomes and patterns of recurrence were not assessed. These results should be confirmed in future multicenter prospective studies of larger numbers of subjects.

Conclusion

Both corticosteroid injections and percutaneous fasciotomy were effective in reducing pain and improving the function of plantar fasciitis in this retrospective cohort study. Percutaneous fasciotomy, however, had greater decreases in VAS pain scores, better functional outcomes and less recurrence than steroid injections.

Percutaneous fasciotomy appears to be more effective for patients with chronic or refractory disease, with corticosteroid injections useful for short-term and cost-effective symptom relief. Larger prospective studies with extended follow-up are recommended in the future to more definitively determine the comparative effectiveness and long-term results of these treatment modalities.

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