

Effect of Positional Release Technique Along with Phonophoresis on Plantar Fasciitis Pain and Foot Function: A Pre–Post Experimental Study

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Abstract

Background: Plantar fasciitis is one of the most common causes of heel pain and functional disability among adults. It is characterized by pain at the medial calcaneal tubercle, particularly during the first steps in the morning and after prolonged weight-bearing activities. Conservative physiotherapy interventions such as stretching, manual therapy, ultrasound, and phonophoresis are widely used. Positional Release Technique (PRT) is a manual therapy approach that reduces pain by placing tissues in a position of comfort, while phonophoresis facilitates transdermal delivery of anti-inflammatory medication through therapeutic ultrasound. Studies have reported beneficial effects of both interventions in reducing pain and improving foot function. Aim of the study to evaluate the effect of Positional Release Technique combined with phonophoresis on pain and foot function in patients with plantar fasciitis.

Methods: Thirty clinically diagnosed plantar fasciitis patients were recruited. Participants received PRT along with diclofenac phonophoresis for four weeks (3 sessions/week). Pain was assessed using the Visual Analog Scale (VAS), and foot function was evaluated using the Foot Function Index (FFI). Measurements were recorded at baseline and after four weeks.

Results: Mean VAS scores decreased significantly from 5.53 ± 1.63 to 2.47 ± 1.61 ($p < 0.001$). Mean FFI scores improved from 40.51 ± 11.15 to 16.47 ± 11.8 ($p < 0.001$). Significant improvements were observed in pain reduction and foot function.

Conclusion: Positional Release Technique combined with phonophoresis was effective in reducing plantar heel pain and improving foot function in patients with plantar fasciitis.

Keywords: Plantar Fasciitis, Positional Release Technique, Phonophoresis, Foot Function Index

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Introduction

Plantar fasciitis is the most prevalent cause of inferior heel pain and accounts for approximately 10% of foot-related musculoskeletal complaints encountered in clinical practice. The condition affects both sedentary and physically active individuals and is frequently observed among middle-aged adults, runners, healthcare workers, teachers, and occupations requiring prolonged standing. The disorder is characterized by degeneration and micro tearing of the plantar fascia, particularly near its insertion at the medial calcaneal tuberosity.

Patients commonly report severe pain during the first few steps after waking in the morning, pain following periods of rest, and discomfort after prolonged walking or standing. Risk factors include obesity, reduced ankle dorsiflexion, excessive foot pronation, prolonged standing occupations, inappropriate footwear, and repetitive loading of the plantar fascia.

The plantar fascia plays a crucial role in maintaining the medial longitudinal arch and facilitating the windlass mechanism during gait. Repetitive tensile stress results in collagen degeneration, fibroblastic hypertrophy, and chronic inflammation-like changes. These pathological changes contribute to

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persistent pain and reduced functional mobility. Consequently, plantar fasciitis significantly affects quality of life and daily activities.

Numerous conservative interventions have been proposed, including stretching exercises, strengthening programs, orthoses, taping, manual therapy, extracorporeal shockwave therapy, ultrasound therapy, and electrotherapeutic modalities. Among these, manual therapy techniques have gained considerable attention because they directly address myofascial dysfunction and mechanical restrictions associated with plantar fasciitis.

Positional Release Technique is an indirect manual therapy method in which the affected tissue is placed in a position of maximal comfort or ease. The technique is believed to reduce gamma motor neuron activity, normalize muscle spindle sensitivity, decrease protective muscle spasm, and improve local circulation. Previous investigations have demonstrated significant reductions in pain and improvements in flexibility following PRT interventions.

Phonophoresis refers to the use of therapeutic ultrasound to enhance transdermal absorption of topical anti-inflammatory medications. Diclofenac phonophoresis has shown promising results in reducing pain, improving tissue healing, and restoring function in patients with plantar fasciitis. Recent evidence indicates that phonophoresis-based treatment programs produce significant improvements in pain and functional outcomes.

Although both PRT and phonophoresis have demonstrated effectiveness independently, limited literature exists regarding their combined therapeutic effect on plantar fasciitis. Therefore, this study was conducted to evaluate the effectiveness of Positional Release Technique along with phonophoresis on pain reduction and improvement of foot function in patients with plantar fasciitis.

Materials and Methods

Study Design

Pre-experimental pre-test and post-test study.

Study Setting

Physiotherapy outpatient department of a tertiary care hospital.

Sample Size

Thirty patients diagnosed with plantar fasciitis.

Sampling Technique

Convenience sampling.

Inclusion Criteria

- Age 25–60 years
- Clinical diagnosis of plantar fasciitis
- Heel pain for more than 4 weeks
- Morning pain and tenderness over medial calcaneal tubercle
- Willingness to participate

Exclusion Criteria

- Calcaneal fracture

- Recent foot surgery
- Neurological disorders
- Corticosteroid injection within previous 3 months
- Rheumatoid arthritis
- Diabetic neuropathy

Outcome Measures

Visual Analog Scale (VAS)

Foot Function Index (FFI)

Intervention Protocol

Positional Release Technique

The patient was positioned supine with the foot beyond the treatment table. Tender points over the plantar fascia were identified. The foot was placed into plantar flexion and slight inversion until pain decreased by approximately 70%. The position was maintained for 90 seconds and repeated three times per session.

Phonophoresis

Diclofenac sodium gel was applied over the plantar fascia. Ultrasound parameters:

- Frequency: 1 MHz
- Intensity: 1.0 W/cm²
- Mode: Continuous
- Duration: 8 minutes

Treatment Duration

- Three sessions per week
- Four weeks total
- Twelve treatment sessions

Statistical Analysis

Data were analyzed using SPSS version 26. Mean and standard deviation were calculated. Paired t-test was used for pre-post comparisons. Significance level was set at $p < 0.05$.

Results

Table 1. Baseline Characteristics of patients (n=30)

Variable	Mean $\pm$ SD	
Age (years)	43.5 $\pm$ 8.7	
BMI (kg/m ²)	28.4 $\pm$ 3.5	
Duration of Symptoms (months)	7.8 $\pm$ 2.6	
Gender	Frequency	Percentage
Male	12	40%
Female	18	60%

The mean age of patients was 43.5 $\pm$ 8.7 years, indicating middle-aged study population. The mean BMI 28.4 $\pm$ 3.5 kg/m² shows that most of the patients were overweight. The average duration of symptoms was 7.8 $\pm$ 2.6 months, showing that patients had been symptomatic for a moderate period before enrolment. The cohort consisted mainly overweight, middle-aged adults with female preponderance and a symptoms duration approximately 8 months.

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Table 2. Comparison of VAS Scores and FFT between pre and post treatment by using paired t-test

Vari- able s	Pre- treat- ment	Post- treatm- ent	Paired t- test	P - Val- ue	Signi- fican- ce
VAS Score	5.53 ± 1.63	2.47 ± 1.61	11.69	< 0.00 01	Both are signif- icant
FFI	40.51 ± 11.15	16.47 ± 11.8	13.28	< 0.00 01	

The table shows the comparison of VAS score and FFT between pre and post treatment. The mean value of VAS score and FFI was reduced after the treatment and it was found statistically significant with p-value < 0.0001. These indicating that the treatment led to marked reduction in pain intensity and functional disability.

Discussion

The present study investigated the effectiveness of Positional Release Technique combined with phonophoresis in reducing pain and improving foot function among patients with plantar fasciitis. The results demonstrated statistically significant improvements in both pain and functional outcomes following four weeks of intervention.

VAS scores decreased significantly from 5.53 ± 1.63 to 2.47 ± 1.61 . This finding suggests that the combined intervention effectively reduced heel pain. The observed improvement may be attributed to the neurophysiological effects of PRT, which decrease gamma motor neuron activity and normalize muscle spindle function. By placing tissues in a position of ease, PRT reduces protective muscle guarding and enhances local circulation. Similar findings were reported by Pattanshetty and Raikar, who observed significant pain reduction following positional release therapy in plantar fasciitis patients.

The present findings are also supported by Solanki et al., who reported significant clinical improvement among plantar fasciitis patients receiving positional release therapy. Their study suggested that PRT effectively reduces pain and improves mobility by decreasing myofascial tension and restoring normal tissue mechanics.

The Foot Function Index improved significantly from 40.51 ± 11.15 to 16.47 ± 11.80 . This substantial improvement indicates enhanced functional mobility and reduced disability. Functional gains may be explained by improved flexibility of the plantar fascia, decreased pain during weight-bearing activities, and restoration of normal gait mechanics. Phonophoresis likely contributed substantially to the observed improvements. Ultrasound-mediated delivery of diclofenac enhances tissue penetration of anti-inflammatory medication, reducing inflammation and facilitating tissue repair. Bhushan

et al. reported significant reductions in pain and disability among plantar fasciitis patients treated with diclofenac phonophoresis, supporting the findings of the present study.

Clinical practice recommendations indicate that phonophoresis may provide beneficial outcomes when incorporated into a comprehensive rehabilitation program. The anti-inflammatory effects of diclofenac combined with mechanical and neurophysiological benefits of PRT may explain the substantial improvement observed in the present investigation.

The findings suggest that combining manual therapy with electrotherapeutic modalities produces synergistic effects. Manual techniques address biomechanical dysfunction, while phonophoresis facilitates local anti-inflammatory action. This combined approach may therefore be superior to isolated interventions.

The present study has several strengths. The intervention protocol was standardized, treatment duration was adequate, and validated outcome measures were utilized. However, certain limitations should be acknowledged. The sample size was relatively small, there was no control group, and long-term follow-up was not conducted. Future randomized controlled trials with larger sample sizes and extended follow-up periods are recommended.

Overall, the present findings support the use of Positional Release Technique combined with phonophoresis as an effective conservative treatment strategy for plantar fasciitis.

Conclusion

Positional Release Technique combined with phonophoresis significantly reduced plantar heel pain and improved foot function after four weeks of treatment. The intervention demonstrated clinically meaningful improvements in both VAS and FFI scores. This combined approach may be considered an effective and safe conservative management strategy for patients with plantar fasciitis.

References

1. Pattanshetty RB, Raikar AS. Immediate effect of three soft tissue manipulation techniques on chronic plantar fasciitis. *Int J Physiother Res.* 2015;3(1):875-884.
2. Solanki P, Patel K, Shah N. Effect of positional release technique versus deep transverse friction massage in plantar fasciitis. *Global J Res Anal.* 2022;11(8):1-5.
3. Sarkar B, Mangalam AK, Sahay P. Efficacy of muscle energy technique in chronic plantar fasciitis. *Int J Health Sci Res.* 2018;8(6):128-136.

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4. Kaur J, Bhatia G. Effect of phonophoresis and myofascial release in plantar fasciitis. *Nat J Clin Orthop*. 2021;5(3):1-3.
5. Mundhava A. Effect of muscle energy technique versus ischemic compression on plantar fasciitis. *Int J Physiol Nutr Phys Educ*. 2020;5(2):165-169.
6. Doley M, Warikoo D, Arunmozhi R. Effect of positional release therapy on trigger points. *J Exerc Sci Physiother*. 2013;9(1):40-45.
7. Shivakumar HB, Chanappa P. Ultrasound therapy and soft tissue techniques in musculoskeletal pain. *J Evol Med Dent Sci*. 2014;3(15):3898-3907.
8. Ravat M, Mody V, Joshi M. Positional release therapy in plantar fasciitis. *Indian J Physiother Occup Ther*. 2025;19(1):40-46.
9. Gupta R, Singh S. Conservative management of plantar heel pain. *Indian J Physiother Occup Ther*. 2019;13(2):44-50.
10. Sharma P, Kumar V. Manual therapy approaches in plantar fasciitis. *Indian J Public Health Res Dev*. 2018;9(7):115-120.
11. Patel H, Mehta D. Ultrasound-based interventions in heel pain. *Int J Med Res Rev*. 2019;7(4):250-256.
12. Shah K, Desai N. Functional outcomes following physiotherapy in plantar fasciitis. *Int J Health Sci Res*. 2020;10(8):142-148.
13. Verma A, Gupta P. Physiotherapy management of chronic heel pain. *Indian J Orthop Pract*. 2018;4(2):55-60.
14. Joshi R, Patel M. Foot Function Index responsiveness in plantar fasciitis. *Indian J Physiother Occup Ther*. 2021;15(1):102-107.
15. Bansal A, Kaur R. Clinical evaluation of plantar fascia interventions. *J Musculoskelet Res India*. 2019;6(2):88-95.
16. Singh D, Arora P. Conservative treatment of plantar fasciopathy. *Indian Med Rev*. 2020;12(1):21-27.
17. Meena S, Sharma K. Therapeutic ultrasound in musculoskeletal disorders. *Indian J Rehabil Sci*. 2019;8(3):33-39.
18. Choudhary P, Jain S. Physiotherapy strategies for plantar heel pain. *Int J Physiother Res*. 2021;9(2):4150-4157.
19. Kumar A, Singh R. Evidence-based management of plantar fasciitis. *J Clin Orthop Trauma India*. 2020;5(4):77-84.
20. Bhushan A. Pain relief in plantar fasciitis: phonophoresis versus iontophoresis. *Physiother Rehabil Int Res J*. 2026;11(2):45-53.