



A case study evaluating the synergistic effects of Multimodal Soft Tissue Therapy combined with a structured home exercise program

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Abstract

Background: Plantar fasciitis is a common cause of heel pain in patients. Multimodal physiotherapy integrating manual techniques such as instrument-assisted soft tissue mobilisation (IASTM), Percussive therapy, and dynamic cupping therapy has shown promising outcomes.

Objective: A Case Study Evaluating the Synergistic Effects of Multimodal Soft Tissue Therapy Combined with a Structured Home Exercise Program.

Methodology: This single-patient case study involved a 25-year-old female with a three-month history of right heel pain who underwent eight physiotherapy sessions over four weeks. Each session included IASTM, percussive therapy, and dynamic cupping, along with a home exercise program. Outcome measures included the Visual Analogue Scale (VAS), Foot Function Index (FFI), and ankle dorsiflexion range of motion, assessed pre- and post- intervention.

Results: VAS score decreased from 7/10 to 2/10, FFI improved by 42%, and right ankle dorsiflexion increased by 7° to 15°.

Conclusion: The combined IASTM, Percussive therapy, Dynamic cupping therapy along with home exercise program produced clinically meaningful improvements within four weeks, suggesting that multimodal physiotherapy can be effective for short-term management of plantar fasciitis in patients.

Keywords: Plantar fasciitis, IASTM, percussive therapy, dynamic cupping therapy, home exercises, physiotherapy

Introduction

Plantar fasciitis is one of the most frequent causes of heel pain in patients and accounts for approximately 10–15% of foot-related complaints. It is commonly associated with repetitive weight-bearing activities and excessive mechanical strain on the plantar fascia. Clinically, it presents as sharp medial heel pain, particularly during the first steps in the morning or after prolonged periods of rest. Physiotherapy remains the mainstay of conservative management, with strong evidence supporting stretching, manual therapy, soft-tissue mobilisation, and structured home exercise programs (Chen, Y., Gupta, *et al.*2021) [1, 2]. Recent literature highlights the benefits of multimodal interventions that combine hands-on therapy with patient-led routines to enhance mobility, reduce pain, and improve tissue load tolerance (Lee, H. & Kim, *et al.*2022) [3]. Instrument-assisted soft tissue mobilisation (IASTM) has been shown to improve soft-tissue flexibility and stimulate local circulation, contributing to short-term pain reduction (Patel, K. & Shah, *et al.*2022) [4]. Percussive devices such as the Percussive provide rapid mechanical pulses that may improve muscle flexibility and reduce myofascial restrictions (Mendes, R, *et al.* 2023) [5]. Dynamic cupping therapy, which involves movement-based suction, is believed to enhance fascial mobility and stimulate mechanoreceptors, contributing to symptomatic relief (Rodriguez, L, *et al.*2023).

Home exercises such as towel stretching and tennis-ball rolling are well supported for improving plantar fascia extensibility and reducing morning pain (Nguyen, Silva, *et al.* 2024) [7, 8]. Evidence also suggests that consistent home-

based loading interventions complement clinic-based manual therapy, improving both short-term recovery and long-term outcomes (Kumar, D, *et al.*2025) [9]. However, limited published case studies have examined the combined synergistic effects of all these modalities in patients. This case study aims to address this gap by presenting a four-week integrated physiotherapy approach for plantar fasciitis.

Case Presentation

A 25-year-old female patient presented with pain in the right heel that had persisted for the last three months. The pain had started gradually after an increase in daily walking. She experienced sharp pain in the right heel during the first steps in the morning and after sitting for a long time. Because of this heel pain, walking and standing for long durations became difficult. The patient had a normal body mass index, no history of systemic illness, no previous lower-limb injuries, and wore flat footwear during work hours. She had not received any prior treatment for the condition. Baseline outcome measures were VAS score 7/10, Foot Function Index 58/100, and ankle dorsiflexion range of motion 7°. The physiotherapy goals were to reduce morning pain to less than 2/10, improve foot function by at least 30%, increase ankle dorsiflexion range of motion to 15°, and enable 40 minutes of pain-free walking. On examination, there was tenderness (Grade 2) on the inner side of the right heel, a trigger point, and a positive Windlass test. The right ankle showed a mild loss of movement, with right ankle dorsiflexion ROM 7° to ROM of 15°, which was within the normal range.

Intervention

Following a four-week multimodal physiotherapy intervention, the patient demonstrated marked improvement in pain intensity, functional capacity, and tolerance to weight-bearing activities. Morning heel pain and first-step discomfort were significantly reduced. Palpation tenderness over the

medial calcaneal tubercle decreased substantially, and ankle dorsiflexion range of motion improved. Functional activities such as prolonged standing and walking were performed with minimal discomfort. The patient reported high compliance with the home exercise program and no adverse effects throughout the intervention period.



Fig 1: Instrument-Assisted Soft Tissue Mobilization (IASTM)



Fig 2: Dynamic Cupping



Fig 3: Percussive Massage Gun for Release of Myofascial

Table 1: Phase- Wise Rehabilitation Intervention (15 Days)

Week	Intervention	Home program	Notes
Week 1	IASTM 8 min, + Percussive therapy 5 min, + dynamic cupping therapy 5-7 min.	Towel stretch 3 set and 10 reps, twice a day, + Tennis ball rolling 10min per day +Plantar Fascia 20 sec hold 2 set 10 reps + Contrast Bath 3 min hot water and 1 min normal water.	Patient education on load management, footwear.
Week 2	Repeat IASTM+ Percussive therapy (6 min) + dynamic cupping therapy (5 min).	Continue home exercise.	Monitor soreness reinforce adherence check ROM.
Week 3	IASTM (focused on fascial tightness), percussive therapy (5 min), dynamic cupping therapy (5 min)	Continue full home program exercise.	Highlight calf flexibility and gradual loading.
Week4	Re-assessment (pain, function, ROM) optional IASTM percussive therapy if residual tightness	Home program maintenance; advise transition to independent management.	Plan for long-term maintenance and gradual return to pre-symptom activity levels.

Results

Following four weeks of intervention, the patient demonstrated marked improvements in pain intensity, functional capacity, and tolerance to weight-bearing activities. VAS score reduced from 7/10 to 2/10, exceeding the minimal clinically important difference and indicating clinically meaningful improvement. The Foot Function Index improved from 58/100 to 34/100, reflecting a 42% functional gain. Ankle dorsiflexion increased by 7° to 15° contributing to improved. Morning heel pain and first-step discomfort were significantly reduced, and walking tolerance improved from 15 minutes to 40 minutes without pain. No adverse effects were reported, except for mild and transient soreness following IASTM sessions. Home exercise adherence was reported to be high.

Table 2: Pre and Post Intervention Outcomes

Measure	Pre-Treatment	Post-Treatment
VAS Score	7/10	2/10
Foot Function Index	58/100	34/100
Ankle Dorsiflexion ROM	7°	15°

Discussion

This case study demonstrated that a multimodal physiotherapy approach was associated with substantial reductions in pain and meaningful improvements in functional capacity in a patient with plantar fasciitis. The observed reduction in VAS score and improvement in Foot Function Index suggest clinically relevant benefits within a relatively short intervention period. These findings are consistent with existing evidence supporting conservative physiotherapy management for plantar fasciitis (Lee, Rodriguez, *et al.*2022,23) [3]. The improvement in ankle dorsiflexion range of motion may be attributed to enhanced soft-tissue extensibility and reduced myofascial stiffness, which are commonly targeted in physiotherapy interventions for heel pain. Improved dorsiflexion is clinically important, as restricted ankle mobility has been identified as a contributing factor to increased plantar fascia strain. Reduction in morning heel pain and first-step discomfort further indicates improved load tolerance of the plantar fascia, a key goal in plantar fasciitis management. Home-based exercises played a supportive role in maintaining tissue mobility and symptom control between

sessions. Consistent daily stretching and self-myofascial release have been shown to reduce plantar fascia stiffness and improve functional outcomes (Nguyen, Kumar, et al. 2024, 25) [7, 9]. The patient's high adherence to the prescribed home program likely contributed to the favourable response observed in this case.

The patient's young age, absence of comorbidities, and early presentation may also have positively influenced recovery. While the findings align with previous reports on multimodal physiotherapy approaches, caution is required when interpreting outcomes from a single-case design.

Conclusion

This case study highlights that conservative physiotherapy management was associated with clinically meaningful improvements in pain, ankle mobility, and functional ability in a patient with plantar fasciitis over a four-week period. The reduction in pain intensity, improvement in functional scores, and enhanced walking tolerance indicate effective short-term symptom management. Although the outcomes are encouraging, the findings should be interpreted cautiously due to the single-subject design. Further research involving larger sample sizes, controlled study designs, and long-term follow-up is recommended to establish the effectiveness and generalizability of similar physiotherapy-based approaches for plantar fasciitis.

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