

## **RECOVERY OF THE PATIENT WITH PLANTAR FASCIITIS USING METHODS AND TECHNIQUES FROM PHYSIOTHERAPY**

*Author Benedek Florian*

University “Ștefan cel Mare” of Suceava  
florian.benedek@usm.ro

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### **Abstract**

The present work aims to demonstrate the importance of physical therapy in a rehabilitation program for patients with plantar fasciitis. Due to its frequency and the problems, it creates, related to the difficulty of working. This is becoming increasingly common in society, making it impossible for the subject to perform various activities.

The goal pursued in this work is for the patient with this problem to recover. The general goal of rehabilitation is to help the patient recover in the shortest possible time, to prevent physical discomfort and, especially, to stop the worsening of the disease.[2,5]

After carrying out the initial and final tests, we were able to collect the results presented in the work and draw the final conclusions of the study.

The reason why we chose this topic is that part of the population is affected by this condition, and through physical therapy we can correct this problem.[7,9,11]

### **Introduction**

Plantar fasciitis is a common and often disabling condition. Plantar fasciitis (also called plantar fasciopathy, reflecting the absence of inflammation) is a common problem, accounting for approximately 1 million patient visits per year, with approximately 60% of these visits to primary care physicians. Plantar fasciitis is seen in a variety of sports, but is most common in recreational and competitive runners, with an estimated incidence of 5% to 10%.[1,6]

Plantar fasciitis can be confirmed by ultrasound. Symptoms of plantar fasciitis primarily involve a sharp pain in the heel or along the arch of the foot, especially with the first step in the morning or after prolonged standing. Plantar fasciitis can present in many different ways, so it is best to have it evaluated by an expert.[3,4,10]

Physical therapy is an effective treatment for plantar fasciitis. Treatment involves a combination of stretching, strengthening exercises, manual therapy techniques, and correction of running, walking, and jumping mechanics. Physical therapy aims to address the underlying factors of plantar fasciitis, such as tight calf

muscles, weak foot muscles, poor foot biomechanics, and reduced mobility of the ankle and midfoot joint. Strengthening exercises focus on improving the strength and stability of the foot and ankle to better support the arch, reduce stress on the plantar fascia, and decrease inflammation.[6,8,10]

### **Material-method**

I chose this topic out of the desire to use the methods, techniques and information studied and in-depth to remedy this condition and to improve the quality of life of patients with this condition.

Purpose and objectives of the work

The purpose is to use the information studied, methods and techniques from physiotherapy to create a program that aims to improve the patient's quality of life.

Objectives of the work

→ Establishing an effective physiotherapy program in improving the patient's quality of life using the techniques and methods studied.

→ Determining the effects that the methods and techniques used following the physiotherapy program have on the patient through initial and final evaluations.

The methods used in this recovery plan are:

measurement of muscle balance using MRC,

VAS scale for approximating the level of pain,

measurement of range of motion using goniometry,

gait analysis with the 6-minute test,

### **Case presentation**

Patient V. G., 53 years old, having had pain in the foot area for several weeks, presented to the rheumatologist with pain in the sole of the foot. The doctor sent the patient to have an X-ray, after the patient returned with the X-ray, the doctor diagnosed plantar fasciitis. She was sent to the recovery doctor, who sent her to physiotherapy.

The examination of the case and the application of physiotherapy treatment took place at her home, considering that she works and cannot get to the clinic.

The materials used in this program were the following:

Massage table, elastic bands, Bobath ball, trellis, bench, bicycle, mattress, etc.

Duration and work stages

The initial assessment of the patient included the following tests:

**Visual Analog Scale (VAS)** - is a subjective method by which the patient's pain was assessed on a scale from 1 to 10. The patient chose a number that was equivalent to her current pain.

Muscle balance (MRC) consisted of assessing the strength at the ankle joint, knee joint and hip joint for all movements.

Range of motion was assessed at the ankle joint, knee joint and hip joint for all movements.

**6-minute walk test** this test involves measuring the distance that an individual can walk in 6 minutes and with it we assessed the patient's exercise capacity.

**The objectives of the physiotherapy program are:**

- pain reduction
- increase in muscle strength
- increase in range of motion
- gait training

**The recovery program was carried out and divided into 3 stages:**

- acute stage
- functional recovery stage
- return to functional activity stage

Pain reduction is the first essential stage in a medical recovery program. The main objective of this phase is to reduce or eliminate the pain perceived by the patient, in order to ensure favorable conditions for continuing physiotherapy treatment.

**Visual Analogue Scale (VAS)** - is a subjective method by which the patient's pain was assessed on a scale from 1 to 10. The patient chose a number that was equivalent to her pain after the physiotherapy program.

Table 1. Patient's VAS scale values

| Pain                     | Initial testing | Final testing |
|--------------------------|-----------------|---------------|
| No pain (0)              |                 |               |
| Easy (1-3)               |                 | 3             |
| moderate to severe (4-6) |                 |               |
| Very severe (7-9)        | 8               |               |
| Unbearable (10)          |                 |               |

**Muscle balance (MRC)** consisted of assessing strength at the ankle joint, knee joint, and hip joint for all movements.

Ankle joint:

Table 2. Patient's MRC scale values

| Movement        | Initial testing | Final testing |
|-----------------|-----------------|---------------|
| Plantar flexion | F3              | F5            |
| Dorsiflexion    | F3              | F5            |
| inversion       | F4              | F5            |
| eversion        | F4              | F5            |

Range of motion was assessed at the ankle joint, knee joint, and hip joint across all movements.

Ankle joint:

Table 3. Range of motion scale values

|                  | Plantar flexion |     | Dorsiflexion |     | inversion |     | inversion |     |
|------------------|-----------------|-----|--------------|-----|-----------|-----|-----------|-----|
|                  | Ti              | Tf  | Ti           | Tf  | Ti        | Tf  | Ti        | Tf  |
| Left limb        | 32°             | 35° | 20°          | 30° | 20°       | 25° | 10°       | 13° |
| The right member | 35°             | 35° | 25°          | 30° | 25°       | 25° | 10°       | 13° |

**6-minute walk test.** This test involves measuring the distance an individual can walk in 6 minutes and with it we evaluated the patient's exercise capacity.

Table 4. 6-minute walk test scale values

| Assessment        | Initial testing | Final testing |
|-------------------|-----------------|---------------|
| Distance traveled | 350 m           | 700 m         |

### Results and Discussion

The results obtained from the study were interpreted in the graphs below.

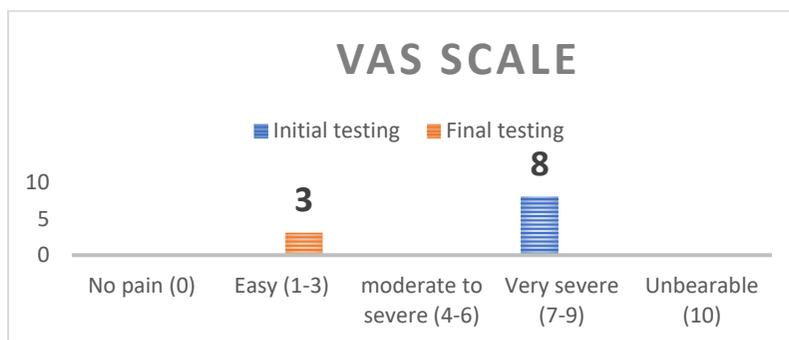


Fig.1. VAS Scale Graph - Initial value and final value

The initial pain score was 8, indicating an intense level of discomfort, specific to the acute phase of the condition. After applying the physiotherapy program, the final pain score decreased significantly, reaching 3 on the VAS scale. This 5-point reduction on the VAS scale highlights the effectiveness of the applied physiotherapy intervention and achieves the initially established objective.

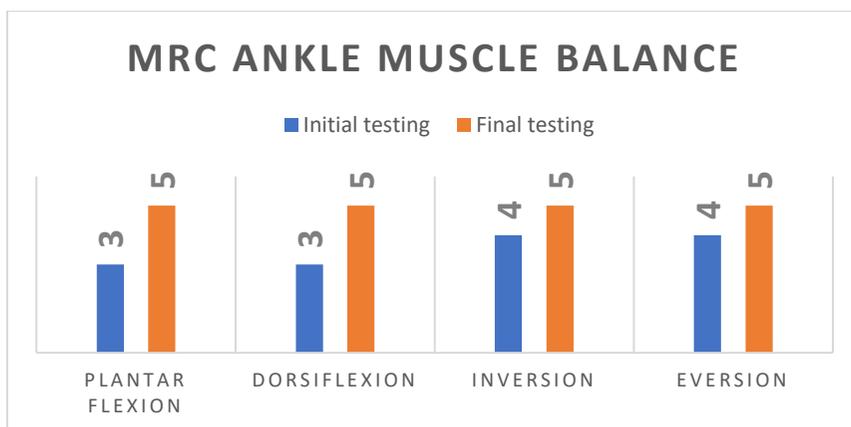


Fig.2 Graph Muscle balance Ankle joint - Initial values and final values

At the initial assessment, the patient presented a strength of grade 3 on plantar flexion and dorsiflexion movements, which indicates the possibility of active movement against gravity, but without resistance. In the case of inversion and eversion movements, the strength was grade 4, reflecting the ability to move actively against moderate resistance. After applying the physiotherapy program, at the final assessment, the patient presented a muscle strength of grade 5 on all tested groups, which signals the complete recovery of muscle strength and restoration of the functional capacity of the ankle joint.

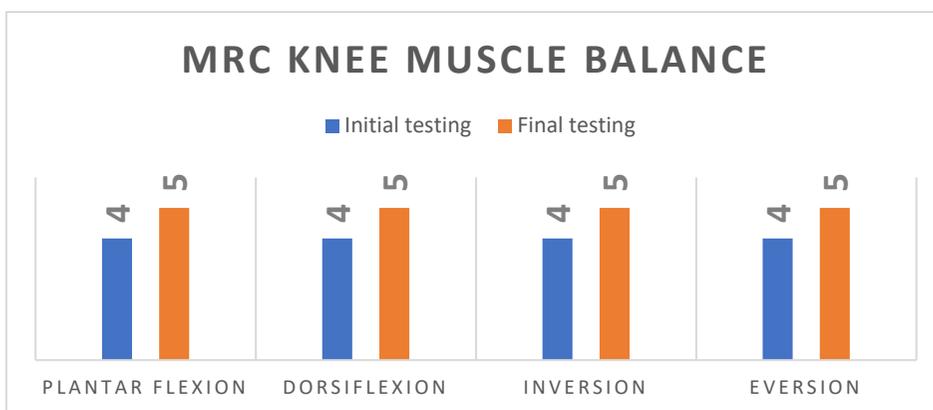


Fig.3 Graph Muscle balance Knee joint - Initial values and final values

Following the application of the physiotherapy program, the final evaluation found that the maximum strength level of 5 was reached for all tested groups, which indicates complete recovery of muscle strength at the knee joint level.

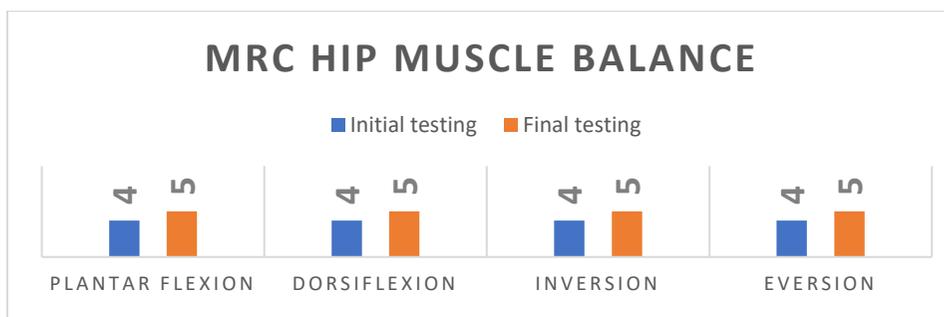


Fig.4 Graph Muscle balance Hip joint - Initial values and final values

After applying the physiotherapy program, an obvious improvement was found at the final evaluation, muscle strength was grade 5 for all tested groups, indicating a complete recovery of muscle strength at the hip joint level.



Fig.5 Graph 6-minute walk test - Initial values and final values

Initially, the patient walked 350 meters, and after applying the physiotherapy program, the distance traveled increased significantly, reaching 700 meters. This doubling of performance reflects the effectiveness of the physiotherapy intervention in improving functional capacity.

### Conclusions

- 1) In the case of the patient with plantar fasciitis, pain reduction was a central objective, as pain is the main symptom affecting quality of life and functionality. After applying a physiotherapy program, a decrease in the VAS score was recorded, which reflects a significant reduction in pain. This evolution demonstrates the effectiveness of the physiotherapy program in controlling pain and improving the functionality of the affected leg.
- 2) After the physiotherapy program, an improvement in muscle strength was observed for all movements, indicating a complete recovery of muscle strength.
- 3) Increasing the range of motion at the ankle was essential. Following the physiotherapy program, the range of motion of the left knee improved by increasing

flexion, (internal) and (external) rotations, contributing to the optimization of joint function during walking. This progress contributes to a more fluid ankle movement, more efficient weight-bearing and the prevention of plantar fascia overuse.

4) After completing the physiotherapy program, the walking distance performance doubled, reaching 700 meters, indicating a considerable improvement in endurance and overall functionality. This progress directly reflects the benefits of the program on coordination, postural control and general mobility.

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