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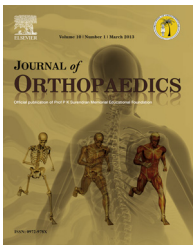

Original Article

Endoscopic plantar fasciotomy versus injection of platelet-rich plasma for resistant plantar fasciopathy

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ABSTRACT

Background: Resistant plantar fasciopathy is a common orthopedic problem.
Aim: Comparing two different methods of treatment.
Methods: Fifty patients with chronic resistant plantar fasciopathy were divided into two groups. The first included 23 patients treated by endoscopic release of plantar fascia (EPF) and the second included 27 patients treated by injection of platelet-rich plasma (PRP).
Results: In the EPF group, the average VAS improved from 8.28 to 2.35. The average AOFAS improved from 65 to 94. In the PRP group, average VAS improved from 8.22 to 2.9 and the average AOFAS improved from 66 to 92.
Conclusion: Both methods gave comparable results at late follow-up.

1. Introduction

The term 'plantar fasciitis' implies an inflammatory condition by the suffix 'itis'. However, various lines of evidence indicate that this disorder is better classified as 'fasciosis' or 'fasciopathy', as heel pain is associated with degenerative changes in the fascia and atrophy of the abductor minimi muscle.[1]

Initial treatment is non-operative and consists of relative rest, physical therapy, stretching, exercises, shoe inserts/orthotics, night splints, non-steroidal anti-inflammatory drugs, and local corticosteroid injections. Patients not responding to conservative treatment for 4–6 months (between 10% and 20% of all patients) are candidates for more aggressive treatment such as extracorporeal shock wave therapy (ESWT) and surgery.[1,2]

Platelet-rich plasma (PRP) is an emerging injection-based treatment for various chronic degenerative soft-tissue diseases. It is postulated to promote native tissue regeneration; however, consistent scientific evidence remains lacking.[3]

PRP is the plasma fraction of autologous blood which has a platelet concentration above baseline. The normal platelet count in whole blood in a healthy individual is between 1.5 and $4.5 \times 10^5/\mu L$. To be labeled as PRP, a platelet count of 4–5 times of the baseline should be present in the platelet concentrate.[4]

Surgical treatments for chronic severe plantar fasciitis, including plantar fasciotomy with and without neurolysis of the calcaneal branches of the tibial nerve, have demonstrated

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conflicting late clinical results with pain and disability persisting in many patients.[5,6]

Potential surgical complications include infection, skin slough, nerve injury, and vascular damage. This has led to the adoption of less invasive surgical release techniques such as the endoscopic fasciotomy and bipolar radiofrequency micro-tenotomy.[7,8]

Endoscopic plantar fasciotomy (EPF) for the treatment of chronic plantar fasciitis/heel spur syndrome was developed by Barrett and Day.[9] The procedure involves an endoscopic approach to the heel, allowing a plantar fasciotomy to be performed with delicate instruments, minimal dissection, and immediate weight bearing. EPF provides the patient with decreased postoperative morbidity and excellent relief of pain.

2. Material and methods

The study included 50 patients with unilateral affection by chronic plantar fasciitis. In all cases, conventional conservative treatment consisting of non-steroidal anti-inflammatory drugs, heel cup, orthoses and/or shoe modifications, and local steroid injections had failed. The patients were randomly classified into two groups according to the method of treatment. Each method was simply clarified to the patients and a written consent was taken from every patient before the start of the study.

All patients were examined pre-operatively for local pain, tenderness, shape of the foot as well as the arch of the foot and orientation of the heel for deformities or flat foot.

Radiological examination was done for the affected heels to exclude local heel pathology including subtalar arthritis, local lesions of the calcaneus, etc.

2.1. Inclusion criteria

Cases with chronic plantar fasciitis after a minimum period of 6 months with no response to traditional methods of conservative treatment including NSAIDs, physical therapy, stretching exercise, and local injection of corticosteroids.

2.2. Exclusion criteria

Active bilateral affection, collagen diseases, cases of old fractures of the calcaneus, and previous surgical interference.

2.2.1. The first group was treated by EPF

This group included 23 patients. The age of the patients ranged between 22 and 51 years with an average of 39.14 years, the pre-operative VAS ranged between 7 and 9 with an average of 8.28, the pre-operative AOFAS ranged between 57 and 78 with an average of 65 and the pre-treatment duration of symptoms ranged between 6 and 23 months with an average of 10.96 months (Fig. 1 and Table 1).

2.3. Technique of EPF

Under general anesthesia and supine position and with a tourniquet applied to the upper thigh, the procedure was performed in all patients using medial and lateral portals. The medial portal was placed 2 cm above the distal heel skin and about 1 cm behind the posterior border of the medial malleolus. A small horizontal incision and blunt dissection of subcutaneous tissue medial to the plantar fascia were done. A path was created using a curved elevator just distal to the plantar fascia from medial to lateral border. A slotted arthroscopic cannula was introduced in this plane until impinging on the lateral skin of the heel to create the lateral portal through small incision. The arthroscope was then introduced from medial portal for visualization of plantar fascia. Using a hook knife through the lateral portal and the slotted cannula, divided the medial half of the plantar fascia from medial to lateral direction under direct vision.

2.3.1. The second group was treated by PRP

This group included 27 patients. The age of the patients ranged between 25 years and 49 years with an average of 36.04 years, the pre-operative VAS ranged between 7 and 9 with an average of 8.22, the pre-operative AOFAS ranged between 57 and 75 with an average of 66 and the pre-treatment duration of symptoms ranged between 6 and 34 months with an average of 11.59 months.

2.4. Technique of PRP injection

2.4.1. Platelets-rich plasma preparation

Blood is withdrawn from the patient (about 50 ml) into a 60-ml syringe that contained 5 ml sodium citrate. Then the blood is centrifuged for approximately 15 min (3000 rounds per minute) using desktop centrifuge. The blood is then separated into platelets poor plasma and platelets-rich plasma. The platelets poor plasma is then extracted and discarded. After one more shaking procedure, the PRP is withdrawn. The resulting platelets concentrate contains approximately a 6–8 times concentration of platelets compared to baseline whole blood.

2.4.2. Injection technique

The procedure is done on an out-patient basis and under complete aseptic condition. Then, 5 cc platelets concentrate is injected using a 22 needle into the most tender area of plantar fascia using a peppering technique (a single skin portal and 4 or 5 penetrations to fascia).

2.4.3. Post-injection protocol

Patients are discharged to home with instruction to limit their activities for 48 h and use acetaminophen for pain control. After 2 days, patients are sent to the physiotherapist to start stretching exercises for 2 weeks and strengthening exercises for additional 2 weeks. At 4 weeks post-injection, the patients are allowed to start normal recreational activities.

3. Results

The results were evaluated using the VAS and the AOFAS and the criteria of Roles and Maudsley score.[10] Patients were reviewed at 6, 12, and 24 weeks post-treatment and at 3 months interval until the end of the study.