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Comparative Effectiveness of Extracorporeal Shock Wave Therapy, Local Corticosteroid Injection and Dextrose Prolotherapy in Treatment of Chronic Plantar Fasciitis: A Randomized Controlled Study

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Abstract:

Background: Assess the effectiveness of extracorporeal shockwave therapy (ESWT), corticosteroid injections, and dextrose prolotherapy in lessening pain, decreasing the plantar fascia's thickness, plus improving foot function in chronic plantar fasciitis cases. **Patients & Methods:** 75 plantar fasciitis cases have been classified into three groups: Group I: twenty-five patients got three ESWT sessions. Group II: twenty-five patients got one local injection of 40 mg/ml methylprednisolone acetate. Group III: twenty-five patients received three dextrose prolotherapy injections of 3.6 milliliters dextrose (25%) with 0.4 milliliters lidocaine. The primary outcomes included the visual analogue scale (VAS) and the foot function index (FFI), while the secondary outcome involved the assessment of plantar fascia thickness (PFT) through musculoskeletal ultrasonography. **Results:** A significant decrease in VAS across all groups at one month follow-up ($P<0.001$). At three months, VAS decreased in all groups, with Group I (77.9%) having the highest reduction. At one month, FFI decreased significantly in all groups ($P=0.01$). FFI reduced in all groups after three months, with Group I (41.7%) decreasing the most. PFT decreased significantly across all groups at one-month interval ($P=0.004$). During the three-month follow-up, PFT dropped in all groups, with Group I (27.5%) having the highest drop, followed by Group II (20%) and Group III (17.2%) with groups I and II differing significantly ($P1=0.002$). **Conclusion:** ESWT, corticosteroid injection, and dextrose prolotherapy reduce chronic plantar fasciitis pain and fasciopathy thickness. Short-term and unfavorable effects of corticosteroid injections make ESWT and dextrose prolotherapy better over time.

Keywords: Plantar fasciitis; Extracorporeal shockwave therapy; Corticosteroid injection; Prolotherapy; Plantar fascia thickness.

Introduction

Numerous diagnoses exist behind the differential for heel discomfort; yet plantar fasciitis remains the predominant etiology for which individuals seek professional treatment. About 10% of the U.S. populace suffers from heel discomfort, leading to one million annual consultations with healthcare providers for plantar fasciitis treatment [1]. The etiology of this condition is complex, associated with recurrent microtrauma and extreme stress. Recent investigations indicate that collagen fibers may exhibit myxoid degeneration, as well as calcification of the fibrous aponeurosis can develop in plantar fasciitis [2]. Plantar fasciitis entails structural alterations at the plantar fascia insertion, resulting in a 2.16 mm thickness increase compared to healthy individuals [3].

Corticosteroid injections are commonly administered in clinical practice; however, they may offer only transient pain relief and can result in significant complications such as plantar fascia rupture, calcaneal osteomyelitis, atrophy of the plantar heel fat pad, as well as damage to the plantar nerve. Exercise and orthoses are straightforward approaches commonly employed in treatment; nevertheless, the evidence is limited, and the outcomes are contentious in this context [6,7]. Exercise and orthoses are simple methods commonly employed in management; nonetheless, the proof is weak, and the outcomes are contentious in this context [8, 9].

Prolotherapy, the injection of a little quantity of a sclerosing or irritating material into damaged tissue, has become increasingly popular in treating plantar fasciitis [10]. It is recognized for facilitating tissue repair and regeneration, releasing substance P, in addition to stimulating fibroblast activity and vascular development [11, 12]. The dextrose prolotherapy approach involves an injectable hypertonic dextrose solution that induces osmotic disruption of cells at the injection site [13]. It induces tissue growth, remodeling, inflammation, and matrix generation as integral elements of wound healing [14,15].

Extracorporeal shock wave therapy is a physical therapeutic approach which employs mechanical waves on a deformable medium to alleviate impairment associated with plantar fasciitis, exhibiting few adverse effects[16].ESWT induce biological alterations in the tissue, resulting in the proliferation of growth factors linked to anti-inflammatory cytokines and tissue regeneration [17,18].ESWT can be administered in two forms: radial or focused, although there is no agreement on which form may be more efficacious [19,20].

The goal of this research was to evaluate the efficacy of ESWT, corticosteroid injections, and dextrose prolotherapy in mitigating pain, decreasing the thickness of the plantar fascia, and improving foot function in chronic plantar fasciitis cases.

Patients & Methods:

Study Design: Randomized controlled clinical study.

Ethical consideration:

The current study followed the Declaration of Helsinki guidelines and required signed informed consent from all patients. Research Ethics Committee at Banha University Faculty of Medicine in Banha approved the study, approval code {M.S.2.11.2023}.

Study Populations:

This study involved seventy-five individuals with plantar fasciitis unresponsive to conservative measures, including physiotherapy, NSAIDs, and stretching exercises for duration of three months. They were recruited from the attendees of the outpatient clinic and inpatients of the Department of Rheumatology, Rehabilitation, and Physical Medicine at Banha University Hospitals. The study duration was from November 2023 to January 2025.

All patients have been diagnosed having plantar fasciitis in accordance with the

diagnostic criteria established by The American Physical Therapy Association (APTA) Orthopaedic Branch [23]. In addition to the existence of ultrasound changes such as: Thickness of planter fascia >4mm [24], focal areas of hypo-echogenicity, peri-fascial fluid accumulation, and bony spur [25].

Inclusion criteria:

1. Cases aged 18 years or older, experiencing symptomatic heel pain for a duration exceeding 3 months.
2. Failure to respond to conservative treatment, including NSAIDs, physiotherapy, and stretching exercises.
3. Bilateral plantar fasciitis patients were evaluated, focusing on the side exhibiting more pronounced symptoms.

Criteria for exclusion:

Patients with systemic inflammatory and rheumatic disorders, diabetes mellitus, hemorrhagic conditions, infection, neoplasia, peripheral neuropathy, skin lesion located on the heel, history of prior surgery or foot and ankle trauma, subjects received local steroid injection therapy within three months or utilized NSAIDs within two weeks prior to treatment.

Interventions:

Patients have been classified into three groups as shown in Figure 1:

Group I: involved twenty-five cases who received three sessions ESWT administered two weeks apart. Each session involved a sequence of five hundred controlled unfocused shock wave pulses delivered at a pressure of 1.5 bar and a repetition frequency of 6 Hertz. The intensity was established at a tolerable level of 0.180 mJ/mm², followed by 1800 controlled unfocused pulses at 1.7 bar with a 10 Hz frequency.

Group II: consisted of twenty-five patients who had just one injection of 40 milligrams per milliliters methylprednisolone acetate and 2 milliliters of 2% prilocaine at the region of greatest tenderness located over the medial side of the heel over the calcaneal tuberosity.

Group III: consisted of twenty-five individuals who were given three injections of dextrose prolotherapy, administered two weeks apart, consisting of 3.6 milliliters dextrose (25%) and 0.4 milliliters lidocaine. Maximum tenderness is observed on the heel's medial side, specifically over calcaneal tuberosity.

The study population was randomly allocated to undergo either ESWT, corticosteroid injections, or prolotherapy injections.

Assessment of outcomes:

The primary outcome metrics included VAS and FFI scores. Secondary outcome measure comprised plantar fascia thickness (PFT) assessed through ultrasonography. All evaluations were conducted by the same examiner at baseline and at 1and 3 months post-intervention.

The VAS has been utilized to assess pain severity (0 = no pain; 10 = the greatest imaginable suffering). The average discomfort was heel pain when conducting daily activities [26].

The Foot Function Index (FFI) is a self-reported questionnaire with twenty-three items grouped into three sections grounded in cases values: disability, pain, and activity limitation. The subject must rate every issue on a scale of 0 (no pain or difficulty) to 10 (worst pain imaginable or so bad it needs help) that best designates their foot during the past week. The scores assigned to each subcategory reflect the extent of the corresponding functional impairment, whereas the overall score represents the comprehensive assessment of foot dysfunction [27].

Musculoskeletal ultrasound was conducted by a skilled rheumatologist at baseline (prior to treatment) and at 1- and 3-month post-intervention using LOGIQ-P9 ultrasound equipment with a 12 MHZ linear probe. A linear probe has been situated longitudinally over the medial tubercle of calcaneus. The thickness of the plantar fascia was assessed longitudinally at its maximum point, which may occur at

the origin of the fascia or within the foot arch. The heel fat pad has been assessed vertically at the minimum distance between the superficial border of the fascia and the skin over the calcaneus, as showing figure 1.

Statistical design:

The Statistical Package for Social Science (IBM SPSS Statistics for Windows Version 23.0, IBM Corp., Armonk, NY, USA).) was used to gather, edit, code, and enter the data. The percentage of observations across all categories and the number of observations in each category or order were examples of qualitative data. The mean, standard deviation, and range were examples of quantitative data. The significance criterion for data analysis was set at P > 0.05. Fisher's exact test (f) has been utilized when the assumption that less than 20% of cells had an expected count of less than five was not met, the Chi-Square [X2] test has been utilized to examine relationships between two or more categorical variables, and one-way analysis of variance (ANOVA) has been utilized to examine relationships between quantitative variables of more than two groups.

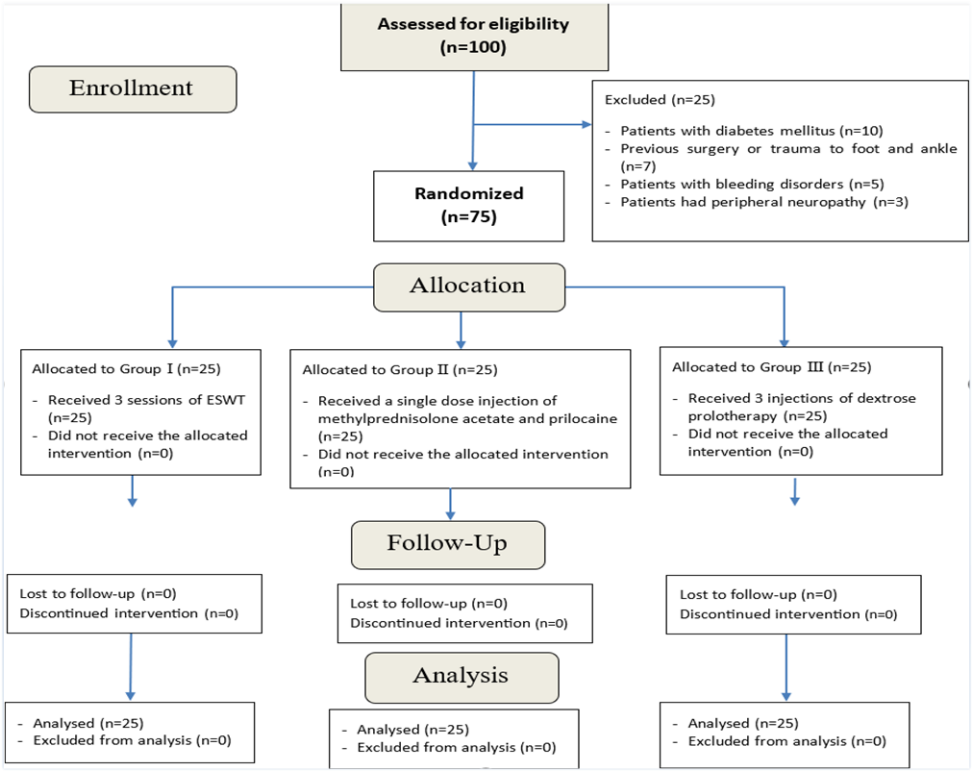

Figure 1: CONSORT chart of the study.

Results

At baseline, the difference in VAS score between groups was not statistically significant (P = 0.45) while it showed significant difference during one and three months follow ups (p <0.001 and 0.009 respectively). At the one-month follow-up, Group II exhibited a significant improvement in VAS score compared to Groups I and III (p <0.001) with no significant difference between Group I and Group III. At three months, Group I showed a significant improvement compared to Group III (p = 0.005) with no significant difference between Groups I and II and Groups II and III [table 2].

At baseline, the difference in FFI scores between groups was not statistically significant (p = 0.46) while it showed significant difference during one and three

months follow ups (p = 0.01 and 0.005 respectively). At the one and three months follow ups, Group II demonstrated a significant improvement in FFI compared to Group I (p = 0.008 and 0.002 respectively), with no significant difference between Group I and Group III, or between Group II and Group III [table 3].

At baseline, the difference in PFT measurements between groups was not statistically significant (p = 0.15). However, at the one-month follow-up, a significant difference was observed (p = 0.004), with Group II showing a significantly greater reduction in PFT compared to Group I (p = 0.008), but no significant difference between Group I and Group III (p = 0.46), or between Group II and Group III (p = 0.15). At the three-month follow-up, no significant differences were found across the groups (p = 0.54), although Group I showed a significantly greater improvement compared to Group III (p = 0.002). No significant differences were found between Group I and Group II (p = 0.17), or between Group II and Group III (p = 0.22) [table 4].

The difference in HFP measurements between the groups was not statistically significant at baseline and at one and three months follow ups (p = 0.82, 0.78, and 0.29 respectively [table 5].

Adverse effects were documented throughout the treatment and at each follow-up appointment (figure 2). All patients displayed temporary erythema following shock wave therapy, and one patient experienced persistent discomfort after ESWT. Six patients had an atrophy of heel fat pad three months after corticosteroid treatment. Five patients experienced paresthesia at the injection site during dextrose prolotherapy. No more clinically significant adverse effects were noted.

Figures 3, 4, and 5 depict the ultrasonography of three of our cases.

Table 1: Demographic & anthropometric data for the examined groups.

Variables		**Group I (number=25)**	**Group II (number =25)**	**Group III (number =25)**	**P Value**
Age (years)	Mean ± SD	41.7 ± 9.46	46.8 ± 8.8	42.9 ± 9.83	
	Range	(30 – 68)	(33 – 65)	(29 – 64)	0.13[1]
Sex (n. %)	Male	5 (20%)	3 (12%)	5 (20%)	
	Female	20 (80%)	22 (88%)	20 (80%)	0.79[3]
BMI (kg/m^2)	Mean ± SD	30.2 ± 3.72	32.5 ± 3.23	31.1 ± 3.42	
	Range	(24.2 – 35.1)	(28.1 – 41.4)	(23.5 – 36.5)	0.06[1]
Disease duration (months)	Mean ± SD	13.7 ± 7.37	18.4 ± 10.3	16.4 ± 6.93	
	Range	(5 – 24)	(7 – 36)	(5 – 24)	0.16[1]

*[1]One way ANOVA test, [2]Chi-square test, [3]Fisher exact test, Non-significant: P -value above 0.05, Significant: P-value not more than 0.05. [Table 1].

Table 2: Comparison of baseline and follow-up VAS scores for the study groups.

Variables		**Group I (number =25)**	**Group II (number =25)**	**Group III (number =25)**	**P Value**	**Post Hock**
Baseline VAS	Mean ± SD	8.16 ± 1.11	7.88 ± 1.3	7.76 ± 1.16		
	Range	(7 – 10)	(6 – 10)	(6 – 10)	0.45	-
1 month VAS	Mean ± SD	5.44 ± 1.36	3.96 ± 0.98	5.72 ± 1.24		P1<**0.001**
	Range	(4 – 8)	(3 – 6)	(4 – 8)	**<0.001**	P2=0.69
% of change from baseline		↓33.3%	↓49.7%	↓26.3%		P3<**0.001**
3 months VAS	Mean ± SD	1.8 ± 1.38	2.24 ± 1.13	2.92 ± 1.12		P1=0.41
	Range	(0 – 4)	(0 – 4)	(0 –5)	**0.009**	P2=**0.005**
% of change from baseline		↓77.9%	↓71.6%	↓62.4%		P3=0.13

*One way ANOVA test, Non-significant: P-value above 0.05, Significant: P -value not more than 0.05

*P1=Comparison between Group I and Group II, P2=Comparison between Group I and Group III, Comparison between Group II and Group III

Table 3: Comparison of the examined groups' baseline and follow-up Foot Function Index (FFI)

Variables		Group I (number =25)	Group II (number =25)	Group III (number =25)	P Value	Post Hock
Baseline FFI	Mean ± SD	159.5 ± 20.7	161 ± 15.3	154.5 ± 20.7		
	Range	(115 – 185)	(140 – 195)	(114 – 190)	0.46	-
1-month	Mean ± SD	132.2 ± 19.7	115.6 ± 17.3	125.8 ± 20		P1=**0.008**
FFI	Range	(95 – 155)	(85 – 154)	(100 – 157)	**0.01**	P2=0.46
% of change from baseline		↓17.1%	↓28.2%	↓18.6%		P3=0.15
3-month	Mean ± SD	93 ± 16.8	110.6 ± 19	102.2 ± 17.5		P1=**0.002**
FFI	Range	(55 – 115	(80 – 140)	(70 –132)	**0.005**	P2=0.17
% of change from baseline		↓41.7%	↓31.3%	↓33.9%		P3=0.22

*P1=Comparison between Group I and Group II, P2=Comparison between Group I and Group III, Comparison between Group II and Group III

Table 4: Comparison of the investigated groups' baseline and follow-up Planter Fascia Thickness (PFT) measurements

Variables		Group I (number =25)	Group II (number =25)	Group III (number =25)	P Value	Post Hock
Baseline	Mean ± SD	5.82 ± 1.19	5.34 ± 1.07	5.29 ± 0.61		
PFT	Range	(4.5 – 8.9)	(4.3 – 8.6)	(4.1 – 6.9)	0.15	-
1-month	Mean ± SD	5.16 ± 0.94	4.46 ± 0.64	4.95 ± 0.57		P1=**0.008**
PFT	Range	(4 – 7.6)	(3.6 – 6)	(3.8 – 6.4)	**0.004**	P2=0.46
% of change from baseline		↓11.3%	↓16.5%	↓6.4%		P3=0.15
3-month	Mean ± SD	4.22 ± 0.58	4.27 ± 0.54	4.38 ± 0.52		P1=**0.002**
PFT	Range	(3.2 – 5.5)	(3.5 – 5.6)	(3.3 –5.7)	0.54	P2=0.17
% of change from baseline		↓27.5%	↓20%	↓17.2%		P3=0.22

Table 5: Comparison of the examined groups' baseline and follow-up heel fat pad thicknesses (HFP)

Variables		Group I (number =25)	Group II (number =25)	Group III (number =25)	P Value	Post Hock
Baseline	Mean ± SD	11.2 ± 1.59	11.5 ± 1.95	11.5 ± 1.51		
HFP	Range	(8.2 – 13.5)	(8.3 – 16.2)	(9.1 – 14.8)	0.82	-
1-month	Mean ± SD	11.5 ± 1.61	11.4 ± 1.99	11.8 ± 1.47		
HFP	Range	(8.5 – 13.7)	(8.5 – 16.4)	(9.5 – 14.9)	0.78	-
% of change from baseline		↑2.7%	↓0.9%	↑2.6%		
3 months	Mean ± SD	12.1 ± 1.57	11.5 ± 2.05	12.3 ± 1.53		
HFP	Range	(9 – 14.2)	(8.6 – 16.5)	(9.8 –15.6)	0.29	-
% of change from baseline		↑8.04%	-	↑6.9%		

*P1=Comparison between Group I and Group II, P2=Comparison between Group I and Group III, Comparison between Group II and Group III

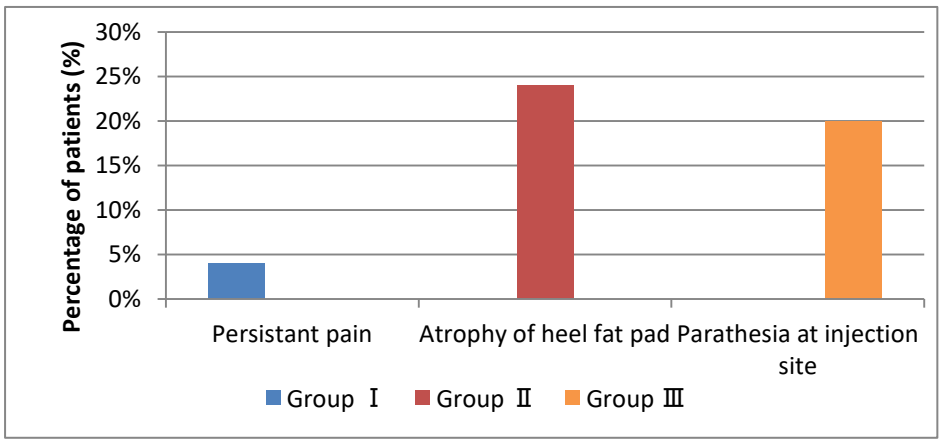

Figure 2: Frequency of undesirable side effects among the studied groups

Figure (3): Longitudinal grayscale ultrasound scan of a patient with plantar fasciitis who received three ESWT sessions. A decrease in PFT is observed, from 0.53 cm at baseline (A) to 0.45 cm after one month(B), and further to 0.43 cm after a three-month interval (C). The Asterix represents the plantar tendon, the arrow represents the plantar HFP.

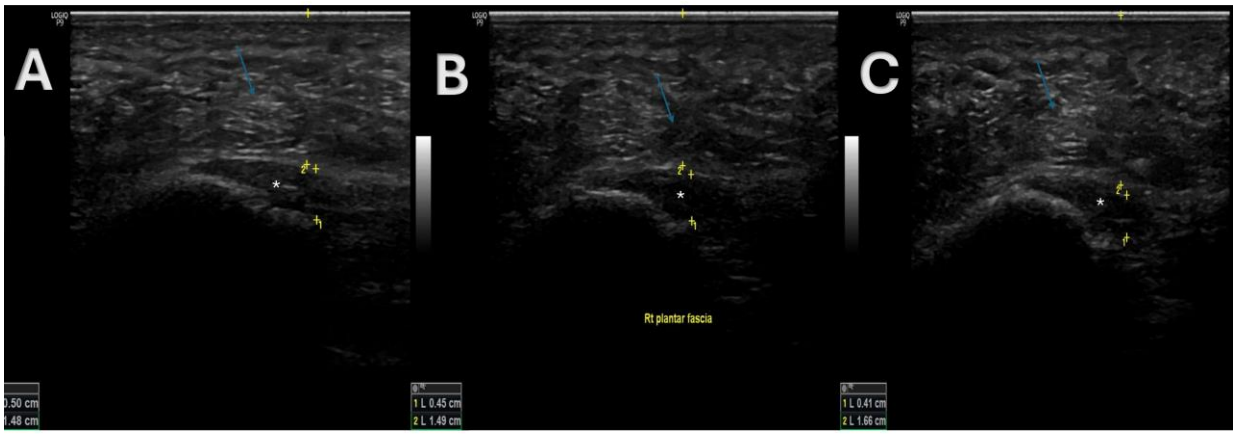

Figure (4): Longitudinal grayscale ultrasound scan of a patient with plantar fasciitis who received dextrose prolotherapy. A decrease in PFT is observed, from 0.50 cm at baseline (A) to 0.45 cm after one month(B), and further to 0.41 cm after a three-month interval (C). The Astrex represents the plantar tendon , the arrow represents the plantar HFP.

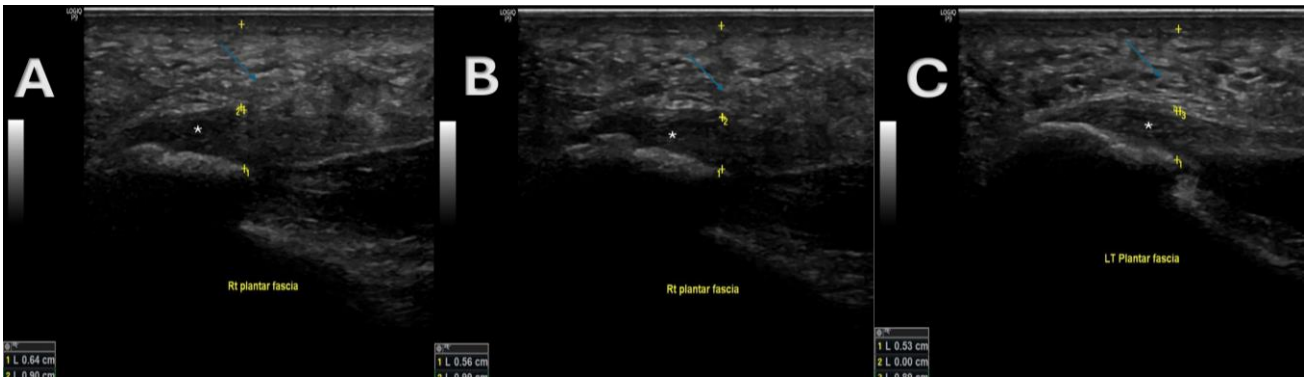

Figure (5): Longitudinal grayscale ultrasound scan of a patient with plantar fasciitis who received local corticosteroid injection. A decrease in PFT is observed, from 0.64 cm at baseline (A) to 0.56 cm after one month(B), and further to 0.53 cm after a three-month interval (C). The Asterix represents the plantar tendon , the arrow represents the plantar HFP.

Discussion:

Our findings demonstrate that ESWT, corticosteroid, and dextrose injections significantly reduce intensity of pain and plantar fascia thickness, while also improving foot function shortly after administration. In chronic plantar fasciitis, corticosteroid injections yield superior short-term satisfaction; extracorporeal shock wave therapy followed by dextrose prolotherapy reduces pain and plantar fascia thickness through a more gradual mechanism. On the other side, over an extended timeframe, ESWT combined with dextrose prolotherapy appears to be a superior option due to the possible adverse effects associated with corticosteroids.

Corticosteroids may have a direct influence on fibroblast activity, which diminished comparatively earlier at the one-month mark, or they may have an indirect inhibitory effect on the expression of extracellular matrix proteins, which minimizes the ensuing cross-sectional area and tissue edema. This could explain the reduction in plantar fascia thickness noted in the corticosteroid cohort [28,29]. The dextrose prolotherapy class demonstrated a decrease in plantar fascia thickness and discomfort at the 3 months mark. The effects of dextrose prolotherapy may be associated with the enhancement of platelet-derived growth factor expression with the elevation of certain mitogenic factors, which may serve as a signaling pathway in tendon regeneration via the issuance of growth factors [30-32]. While the precise therapeutic mechanism of prolotherapy remains incompletely elucidated, current studies indicate that it not only activates the healing cascade but also enhances fibroblast proliferation and collagen synthesis [33,34]. Mariotto et al. reported that the pronounced suppression impact of corticosteroids, in contrast to the proliferative influence of dextrose on tissue, could elucidate the expedited action of steroids in reducing discomfort and thickness at 1-month interval. The proposed mechanism of ESWT involves the swift augmentation of activity of endothelial nitric oxide synthase, leading to the inhibition of NF-κB, which may result in anti-inflammatory consequences [35]. Furthermore, ESWT may promptly enhance blood flow in the treated region. Goertz et al. conveyed that ESWT significantly affects microcirculation through vessel vasodilation and neovascularization, potentially due to an elevation in endothelial nitric oxide synthase [36]. It also facilitates the restoration of injured tissues by promoting angiogenesis [37].

Our findings on pain assessment and FFI evaluation partially aligned with El-helw et al. who found that eight weeks post-intervention, the pain score measured by VAS showed significant improvement in the ESWT class, less in the prolotherapy class, and least in the corticosteroid class. In addition, the ESWT group demonstrated a greater degree of improvement compared to the other groups, showing that ESWT had a long-term analgesic impact. Eight weeks after intervention, the overall FFI score has enhanced meaningfully in the ESWT group, less so in the prolotherapy group, and least in the corticosteroid group, indicating that ESWT exerts a sustained positive impact on functionality in cases having chronic plantar fasciitis. Nevertheless, the thickness of the plantar fascia was not assessed in this study [38].

Baykut et al. revealed that both ESWT and dextrose prolotherapy diminished morning VAS values and plantar fascia thickness by week twelve relative to baseline (p-value under 0.001). Their findings diverge from ours, showing that prolotherapy reduced VAS values more than ESWT throughout the intermediate term (3 months) but did not affect functional metrics [39]. Kesikburun et al. observed that ESWT and dextrose prolotherapy were equally beneficial in persistent plantar fasciitis patients who did not respond to conservative treatment, as judged by pain and FFI [40].

Our findings are consistent with a previous randomized controlled trial which established low-energy ESWT as an effective intervention for plantar fasciitis, providing lasting improvement in comparison to local corticosteroid injection. The FFI score significantly decreased for both groups; however, the ESWT group exhibited greater improvement compared to the local corticosteroid injection group at the 3- and 6-month follow-up appointments (P-value under .05). Significant improvements were noted at the 3- and 6-month follow-up appointments relative to baseline, with the exception of the 1-month interval (ESWT group: 4.6 ± 0.8 and 4.5 ± 1.1 vs. 5.3 ± 0.6, P < .05; local corticosteroid injection cohort: 4.5 ± 0.9 and 4.9 ± 0.7 versus. 5.2 ± 0.5, P < .05). The local corticosteroid injection treatment had good initial results, but it did not relieve pain as well as ESWT at three months [41]. A statistically considerable decrease in plantar fascia thickness was noted at 12 weeks in both groups. The ESWT group had a greater reduction in plantar fascia thickness compared to the local injection group [42]. Cortés-Pérez et al. conducted a meta-analysis included 1,121 plantar fasciitis patients from 16 trials. ESWT outperformed corticosteroid injections at three months in improving pain (SMD −0.6; 95% CI −1.1 to −0.11), reducing plantar fascia thickness (SMD −0.4; 95% CI −0.8 to −0.01), as well as improving foot function (SMD 0.27; 95% CI 0.12–0.44). The authors came to conclusion that ESWT is both safe and effective at mid-term follow-up in relieving pain, lowering plantar fascia thickness, and increasing foot function compared to corticosteroid injection [43].

The plantar HFP serves as a significant indicator of the stresses experienced by tissues. The THP in healthy subjects is stated to vary from 12 mm to 28 mm [44]. Prior research indicated that the plantar HFP was markedly reduced in patients suffering from plantar fasciitis and heel pain [45-49]. Belhan et al. reported that it is possible that the heel pad's thinning is the result of degeneration brought on by recurring microtraumas [50]. To our knowledge, this is the first research that evaluated the impact of prolotherapy, local corticosteroid injection, and ESWT on the thickness of the plantar heel fat pad. At one- and three-month follow-ups, we observed that the heel fat pad's thickness had increased in both the ESWT and prolotherapy groups, with the ESWT group outperforming the prolotherapy group. However, there was no statistically significant change.

This study has certain limitations. Extended follow-up durations and the incorporation of a placebo control group are essential. The sample size was limited, comprising twenty-five patients in each group. The patients were monitored for a duration of three months post-intervention, which is considered a brief period, and the patients were unable to undergo evaluation for relapses. Furthermore, the corticosteroid injection and dextrose prolotherapy were not performed under ultrasound guidance, which constitutes another limitation of the study. Further research with a larger population and extended follow-up are recommended to validate the results of this research and determine the optimal therapeutic strategy for plantar fasciitis. This study is novel, regardless of these constraints, as few clinical studies have compared the efficacy of dextrose prolotherapy in with corticosteroid injection and ESWT in cases having plantar fasciitis. Furthermore, this study is, to our knowledge, the 1st to evaluate the thickness of the plantar fascia and plantar heel pad by musculoskeletal ultrasonography after intervention with these three treatments.

Conclusion:

In chronic plantar fasciitis patients, ESWT, corticosteroid, and dextrose injections dramatically improve pain intensity and fascia thickness. ESWT with dextrose

prolotherapy gradually lowers pain and fascia thickness, while corticosteroid injections provide short-term relief. ESWT and dextrose prolotherapy are superior to time due to the short-term and adverse effects of corticosteroid injections.

Conflict of interest:

None of the contributors declared any conflict of interest.

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