



Case Report

Effect of Korean Medicine Treatment Combined with Conventional Medicine in Patients Diagnosed with Plantar Fasciitis

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ABSTRACT

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This study examined the effectiveness of Korean-Western cooperative treatment for patients with plantar fasciitis. Fifty patients received Korean medicine treatments (acupuncture, pharmacopuncture, herbal medicine) and Western medicine treatments (polydeoxyribonucleotide, and extracorporeal shock wave therapy). Evaluation methods used were comparison before and after ultrasound (P9), and numeric rating scale scores. Results revealed a significant improvement in the level of pain and evaluation of improvement using ultrasound. Moreover, it was suggested that Korean-Western cooperative medicine treatment may be effective for the treatment of plantar fasciitis.

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Introduction

Plantar fasciitis is characterized by a sharp pain in the medial surface of the longitudinal arch and the heel bone [1], which worsens in the morning or during the first few steps. As the gait progresses, the plantar fascia stretches and metabolites are dispersed and decrease in concentration [2]. Although the etiology of plantar fasciitis is unclear, it is thought to involve changes in the thickness of the plantar fascia. This is because of repetitive and excessive stretching load on the plantar fascia that cause inflammatory changes, resulting in the destruction of collagen fibers, abnormal fibroblasts, and blood vessels. Other diagnoses that need to be distinguished from plantar fasciitis include acute injured plantar

fasciitis, calcaneal fatigue fracture, and subcutaneous fat layer atrophy or bruise [3].

Conservative treatment is performed within 6 weeks of onset of symptoms, and rapid recovery may be possible. However, if the condition/disease becomes chronic, it is difficult to predict the therapeutic outcome [4]. Widely used extracorporeal shock wave therapy (ESWT) or stretching exercises for the plantar fascia can be performed, before proceeding with administration of anti-inflammatory agents. When conservative treatment fails, surgery is an option [5].

X-ray imaging is a technique for diagnosing plantar fasciitis, but must be used in conjunction with other methods because X-ray images may sometimes indicate plantar fasciitis in people without

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plantar fasciitis [6]. Ultrasound can be used to treat and diagnose plantar fasciitis. If the plantar is greater than about 3.5 to 4 mm thick at the calcaneal attachment on the long-axis image of the ultrasound, it can be diagnosed as plantar fasciitis. The sensitivity and specificity were reported to be 88.5% compared with 80% via magnetic resonance imaging. Plantar fasciitis causes thickening in a fusiform shape at the calcaneal attachment, exhibiting overall hyporeflexia [7,8]. Some studies showed a significant difference in plantar hypertrophy on ultrasound [9,10] and other studies compared the thickness of before and after treatment [11,12].

There have been many studies in Korean medicine treatment which depended on patient statements such as the visual analogue scale, numeric rating scale (NRS), and patellofemoral pain syndrome as evaluation [13] but no studies of using radiology as diagnosis. In addition, there has been no case of evaluating the treatment of plantar fasciitis using Korean-Western cooperative medicine in Korea.

Case Report

Patients

This study was a retrospective chart review conducted on patients who visited a Korean medicine hospital with plantar fasciitis from March to June 2021 as an outpatient. As the selection criteria, the representative symptoms of plantar fasciitis were pain on the heel of the foot with the first step in the morning, and pain when the calcaneal attachment was pressed. As exclusion criteria, other conditions/diseases such as acute injured plantar fasciitis, calcaneal fatigue fracture, patients who had received treatment for less than 6 weeks, and cases where plantar fasciitis diagnosis could not be confirmed by imaging because the plantar measured less than 3.5 mm on ultrasound were excluded from the study (Fig. 1).

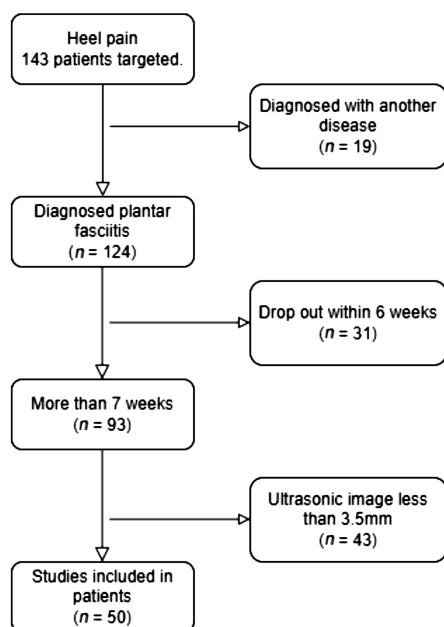


Fig. 1. Flowchart of patients.

Treatment

Korean medicine treatments

Patients were asked to visit hospital once a week. Acupuncture was performed in a sitting position with the operator facing the patient, and acupuncture was performed for 20 minutes using disposable needles (Dongbang Acupuncture Inc., Seongnam, Korea). Distal acupuncture was performed on both sides according to the principle of Dong-Si, Sa-am and 5 transfort point. The acupuncture points were Gol-gwan, Mok-gwan, EX-LE10 (0.2 × 15 mm) KI3, KI4, KI5, KI6, BL60 (0.25 × 30 mm).

Pharmacopuncture was performed for plantar fasciitis transversely and palmary using a 1 mL 30G insulin syringe (Sungshim Medical Co., Bucheon, Korea). The area for treatment was divided into 6 areas and about 0.1–0.2 cc was inserted into each area. For pharmacopuncture treatment Jungsongouhyul (Jasang Korean medical hospital, Seoul, Korea, Paeonia lactiflora Pall, S. miltiorrhiza, Persicae Semen, Myrrha, Corydalis remota, Frankincense, Sappan Lignum, Gardenia jasminoides Ellis, and Tongwon (Korean medical college of Sangji University, Wonju, Korea, Nelumbinis Semen, Dioscorea septemloba Thunb, Poria cocas Wolf, Coicis Semen, Malt, Dolichoris Semen, Euryale ferox Semen) were used.

There were 27 patients who were prescribed herbal medicine and were instructed to take it once in the morning for 30 days (Table 1).

Western medicine treatments

Western medicine treatment was performed in parallel with the Korean medicine treatment. Polydeoxyribonucleotide (PDRN) was injected (Levoco, Kolon Pharmaceutical Inc., Gwacheon, Korea) by a neurosurgeon using ultrasound to guide around the plantar fascia.

ESWT treatment was 2,500 strokes for 4 minutes, focusing on the plantar fascia and where the patient complained of pain.

Evaluation criteria

NRS

The patient was asked to express the level of pain expressed as a subjective number 0 (no pain) to 10 (the most pain).

Ultrasound

The thickness of the outer margins of the fascia was measured by scanning the longitudinal axis from the medial side of the proximal part where the plantar fascia attaches to the calcaneus surface after the patient had placed their feet on the edge of the examination table (Fig. 2). For ensuring objectivity, ultrasound measurements were performed by a radiologist at the hospital, independent to this study.

Statistical analysis

The indexed values were processed through SPSS for Windows Korean Version 28.0.1.0. (IBM Korea Corp., Seoul, Korea). For analysis demographic statistics such as mean, paired *t* test and bivariate analysis were used. If the *p* value was less than 0.05, the difference was considered statistically significant.

Table 1. Herbal Medicine Prescription and Composition.

Prescription (N)	Composition
Dang-gwijeomtang tang (14)	Ostericum koreanum, Artemisia capillaris Thunb, Angelicae, Scutellaria baicalensis, Anemarrhena asphodeloides BUNGE, Alisma canaliculatum, Poria cocos Wolf, Polyporus umbellatus FR, Atractylodes macrocephala Koidzumi, Sinomenium acutum Rehder et Wilson, Ginseng Radix, Sophora flavescens AIT, Cimicifuga heracleifolia KOM, Pueraria lobata Ohwi, Atractylodis Rhizoma, Angelica koreana Glycyrrhiza uralensis
Yug-mijhwang tang (8)	Alisma canaliculatum, Moutan Radicis Cort, Rehmanniae Radix Preparata, Lycium chinense, Poria cocos Wolf, Achyranthes bidentata Blume, Eucommia ulmoides Oliver, Anemarrhena asphodeloides BUNGE, Phellodendron amurense Ruprecht, Angelica gigas
Dae-bangpoong tang (5)	Angelica gigas, Achyranthes bidentata Blume, Cnidium officinale, Angelica koreana L., Glycyrrhiza uralensis, Paeonia lactiflora, Astragalus membranaceus, Rehmanniae Radix Preparata, Ledebouriella seseloides, Aconitum carmichaeli Debeaux, Eucommia ulmoides Oliver, Salvia miltiorrhiza BUNGE

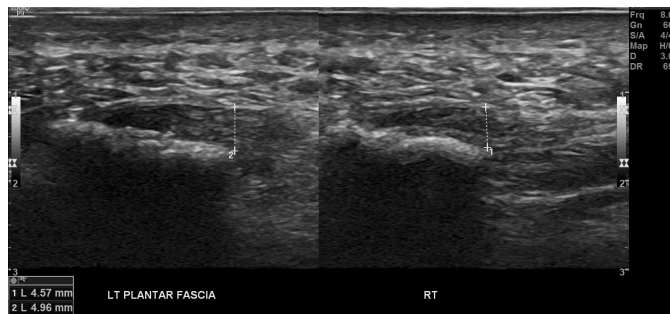


Fig. 2. Plantar fascia thickness measurement.

Results

There were 50 patients whose data was retrospectively analyzed. The average age of the patients was 58.9 (± 10.69) years (Table 2). The most common treatment period was 13 to 16 weeks. The average number of PDRN injections was 8.04 (± 2.85) and the average number of ESWT treatment was 3.48 (± 1.89; Table 3). The mean plantar fascia thickness before treatment was measured as 4.87 mm (± 1.08), and after treatment it was 4.11 mm (± 0.94). The mean NRS score before treatment was 5.84 (± 0.93) and after treatment it was 3.74 (± 1.40). Before treatment, the average plantar fascia thickness of males was 4.99 mm (± 0.92) and of females was 4.72 mm (± 0.87). After treatment, the average plantar fascia thickness for males was 4.31 mm (± 0.87) and for females it was 3.86 mm (± 0.92). Before treatment, the average NRS score of males was 5.89 (± 0.89) and of females was 5.78 (± 1.00). After treatment, the average NRS score of males was 3.96 (± 1.63) and for the females it was 3.48 (± 1.04). There was no significant correlation between ultrasound thickness and NRS score before treatment (|r| = 0.266), and after treatment (|r| = 0.239; Table 4).

Discussion

Korean-Western cooperative medicine treatment improved the level of pain and showed improvement in ultrasound imaging in

Table 2. General Characteristics of the Patients.

Characteristics	N	%	
Sex	Male	24	48
	Female	26	52
	Total	50	100
Age range (y)	< 40	1	2
	40-49	8	16
	50-59	17	34
	60-69	17	34
	70-79	5	10
	≥ 80	2	4
Mean (± SD)	58.96 (± 10.69)		
Main pain site	Left	21	42
	Right	29	58

Table 3. Period and Number of Treatments.

Characteristics	N	%	
Treatments	< 12	10	20
	13-16	22	44
	17-20	10	20
	≥ 21	8	16
	Mean (± SD)	17.50 (± 10.44)	
PDRN	8.04 (± 2.85)		
ESWT	3.48 (± 1.89)		

ESWT, extracorporeal shock wave therapy; PDRN, polydeoxyribonucleotide.

Table 4. Comparison of Between Before Treatment and After Treatment.

Thickness of plantar fascia (mm)	Before	After	<i>p</i>
Total	4.87 (± 1.08)	4.11 (± 0.94)	< 0.01*
Male	4.99 (± 0.92)	4.31 (± 0.87)	< 0.01*
Female	4.72 (± 0.87)	3.86 (± 0.92)	< 0.01*
Total NRS	5.84 (± 0.93)	3.74 (± 1.40)	< 0.01*
Male	5.89 (± 0.89)	3.96 (± 1.63)	< 0.01*
Female	5.78 (± 1.00)	3.48 (± 1.04)	< 0.01*
Correlation of NRS score and thickness of plantar fascia (mm)	Before treatment	After treatment	
	0.266	0.239	

< 0.01**, paired t-test.
NRS, numeric rating scale.

both male and female patients diagnosed with plantar fasciitis. Goll-gwan and Mok-gwan are Dong-si of the acupuncture point and the EX-LE10 is empirically used for muscle pain and is effective for plantar fasciitis. KI2, KI3, KI4, KI5, KI5, BL60 are acupoints commonly used for foot pain. The acupuncture treatment may take effect by directly entering the cells through a certain route of the meridian system, local tissues, blood and lymph, and affecting the activities of tissues and organs [14]. Pharmacopuncture [15,16] and herbal medicine [17] is effective for plantar fasciitis (classified as a degenerative condition/disease). Injection with PDRN [18] and ESWT [19] is effective for plantar fasciitis. However, ESWT sometimes does not improve symptoms long-term [20]. This study is meaningful because it is the first study published in Korea, evaluating Korean-Western cooperative treatment for plantar fasciitis. In addition, the treatment efficacy was evaluated for 50 patients and significance was observed. As an evaluation index, ultrasound diagnosis and the NRS are objective. However, this study has limitations. This was a retrospective study of only outpatients who had received more than 7 weeks of treatment, ultrasound was used rather than magnetic resonance imaging which offers superior accuracy and sensitivity, and the difference in NRS values compared with previous studies, is considered to be due to large individual differences.

Conflicts of Interest

The authors have no conflicts of interest to declare.

Funding

None.

Ethical Statement

This study was conducted under the review of KoNIBP's e-irb (no.: P01-202202-01-025).

Data Availability

All relevant data are included in this manuscript.

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