

Plantar Fasciitis: Two Chronic Cases Treated with a Novel Herbal Patch

Lung-fung TSE¹, Hi-shan Cheng¹, Leung-kim Hung^{1,2}, Ellie Pang^{3,4}, King-fai Cheng^{3,4}, Wing-sum Siu^{3,4}, Jing-zhou Chen², Xue-lin Zhou^{3,4}, Chak-hei Fung^{3,4} and Ping-chung Leung^{3,4*}

¹Department of Orthopaedics and Traumatology, Prince of Wales Hospital, China

²Department of Orthopaedics and Traumatology, CUHK, China

³Institute of Chinese Medicine CUHK, China

⁴State Key Laboratory of Phytochemistry and Plant Resources in West China, The Chinese University of Hong Kong, China

*Corresponding author: Ping-chung Leung, Director, Centre for Clinical Trials on Chinese Medicine, 5/F, The CUHK Hong Kong Jockey Club School of Public Health Building, Prince of Wales Hospital, Shatin, NT, Hong Kong SAR, China, Tel: (852) 2252 8868; Fax: (852) 2632 5441; E-mail: pingcleung@cuhk.edu.hk

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Abstract

The study was to observe the safety and anti-inflammatory effects of a topical herbal agent. The herbal patch contained extracts of the 3 herbs *Flos carthami* (紅花), *Radix dipsaci* (續斷), *Rhizoma rhei* (大黃) and *Borneolum syntheticum* (冰片). The Pain score Visual Analogue Scale (VAS) and Foot Function index (FFI) questionnaires were conducted to measure pain and disability. Blood was taken to measure the inflammation cytokines. All the assessments were processed on before and after the treatment intervention. After treatment, the pain score and foot function index were remarkably improved. Inflammation Cytokine IL-8 was decreased. The novel herbal patch used in this study has laboratory evidences of anti-inflammation and pro-angiogenesis. With its mildly penetrative property, it could be a suitable additional tool for patients' self-care.

Keywords: Plantar Fasciitis; Herbal Patch; Heel pain

Introduction

Plantar fasciitis is the most common cause of heel pain and accounts for 15% of foot disorders [1]. In US it is estimated that 2 million people suffer from plantar fasciitis and require treatment [2].

Plantar fasciitis usually starts as an acute inflammation at the proximal attachment of the plantar fascia. The inflammation turns chronic and subsides into "fiber fragmentation" in association with myxoid degeneration [3]. Predisposing causes include foot arch abnormalities causing increasing tension on the plantar fascia, overweight, work related prolonged standing and degenerative changes [4].

Clinically heel pain with exacerbation on standing is the major presentation. Ultrasonic investigation might indicate thickening of the plantar fascia at its calcaneal attachment [5]. Radiological detection of a calcaneal bone spur might not be a proof of the pathology.

Management for plantar fasciitis is simple and straight forward: including anti-inflammatory drug administration, physiotherapy with mechanical stretching, shock wave, or local steroidal injections. However, recurrences are common, and many cases may turn chronic [6]. Orthosis and night splints might help, but again, relief tends to be partial. Local topical application of drugs is usually considered useless and futile.

A Novel Herbal Patch

We realize that this common condition responds to local treatment but tends to recur. Since there is a varying degree of inflammation in the plantar fascia origin, if a topical agent can penetrate through the overlying skin and stays around the degenerating plantar fascia, there could be more sustained effects. Chinese herbs have been commonly used as topical agents in musculo-skeletal injuries by traditional bone

setters. Our early studies, using 4 herbs with well-known anti-inflammatory and proangiogenic activities, viz. *Flos carthami* (紅花), *Radix dipsaci* (續斷), *Rhizoma rhei* (大黃) and *Borneolum syntheticum* (冰片), have shown and proven their pharmacological effects in in-vitro and in-vivo experiments [7]. We selected *Rhizoma rhei* (大黃), and *Radix dipsaci* (續斷) because their bioactive compounds were found capable of penetrating through the skin into the deeper tissues to exert their therapeutic effects. Our previous study also demonstrated that *Flos carthami* (紅花) could strongly promote anti-inflammation effects. *Syntheticum borneolum* (冰片) is one of the common enhancers to facilitate the transdermal transport of topical herbal agents. It was therefore used as a 2.0% supplement in the formula as an enhancer. There is sufficient evidence that the topical application would send chemical molecules across the skin barrier to reach deeper tissues and general circulation as was indicated in the analysis of the standard chemical markers unique for the herbs [8].

A paste was manufactured from the four herbal extracts and laid onto a self-adherent fabric carrier to produce a herbal medicinal patch for the topical treatment of Plantar fasciitis.

A Pilot Study

A self-control pilot study was designed to observe the effectiveness of the topical treatment for plantar fasciitis using the herbal patch. Patients suffering from unilateral or bilateral heel pain diagnosed as plantar fasciitis and treated at the orthopaedic clinic and podiatrist clinic of the Prince of Wales Hospital were recruited on a voluntary basis. All volunteers had heel pain for more than 30 days. Proper consent declarations were signed. Patients with foot ulcerations and known to be allergic to herbs were excluded. The participant received ultrasonography to measure the thickness of fascia which further confirmed the pathology of plantar fasciitis. The Foot Function index questionnaires were conducted to measure pain and disability. 8 ml blood was taken to measure the inflammation cytokines. All the

assessments were processed before and after the treatment intervention. During the treatment period, a self-administrated diary was used to record the pain in visual analog scale and compliance.

Assessment criteria included Foot Functional Index for foot pain and disability [9,10], ultrasonography for the swelling at the plantar fascia and serum inflammation cytokines. The pilot study was designed for a total of 10 patients. Two patients who suffered from chronic heel pain diagnosed as plantar fasciitis (case 1 for 4 weeks and case 2 for 156 weeks) did not receive any pharmaceutical treatment at the time of recruitment were chosen for this report because they represented the shortest and longest clinical duration in this cohort.

Method

The patients were required to keep the self-adherent medicinal patch in contact with the heel for more than 6 hours per days, and the

patch should be renewed every day. The two patients followed completely the requirements for 6 weeks. Follow up visits and checkups were given every two weeks, when pain score and foot functional index were taken.

Results

Results of the six weeks treatment had been very promising. Pain score dropped remarkably. The foot functional index also improved remarkably. Inflammation cytokine IL-8 (pg/mL) declined significantly (Table 1) (Figure 1).

Patient	Pain Score		Foot Function Index		IL-8 (pg/mL)		Allergic reaction	Concomitant anti-inflammation drug
	Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment		
Case 1	10	0	53.6	22.2	4.9	≤3.6	Nil	Nil
Case 2	4	1	32.6	12.3	5.5	≤3.6	Nil	Nil

Table 1: Changes in Pain Score, FFI and Cytokine before and after treatment.

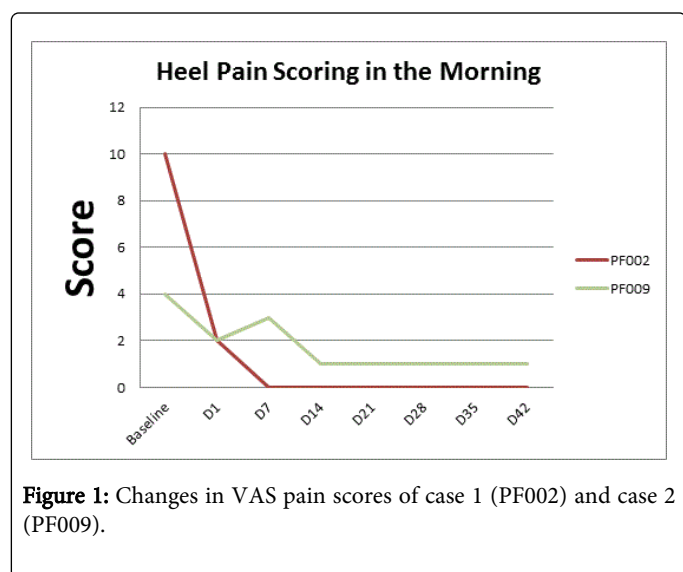


Figure 1: Changes in VAS pain scores of case 1 (PF002) and case 2 (PF009).

Discussion and Conclusion

Plantar fasciitis has been effectively treated with a variety of means. Unfortunately, recurrences are common. Patients would prefer some simple effective treatment that can be handled by themselves, and that even when administered on a long term, adverse effects are unlikely. Chinese medicinal herb extracts have been popular for musculo-skeletal problems. The novel herbal patch used in this study has laboratory evidences of anti-inflammation and pro-angiogenesis. The six weeks' treatment gave most encouraging results. With its

penetrative property, it could be a suitable additional tool for patients' self-care.

The results of the 6-week treatment illustrated that the findings were promising. We are convinced that the herbal patch is safe and can be used as a supplementary treatment for plantar fasciitis. Further studies involving more patients are needed to better demonstrate its efficacy and safety.

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