Plantar Fascia Specific Stretching Exercise vs. Corticosteroid Injection for the Treatment of Chronic Proximal Plantar Fasciitis: A Prospective Randomized Study

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Summary
This protocol, for it provides a cheap, non-operative and non-invasive treatment option that resulted in a rate of improvement of symptoms that surpassed the responses to more traditional treatment methods for patients with chronic, disabling proximal plantar fasciitis.

Introduction
Proximal plantar fasciitis is a common problem in the adult population and is the most common cause of heel pain. The disorder is seen relatively frequent in athletically active individuals as well as those with sedentary lifestyles. Although the etiology of plantar fasciitis is poorly understood, the most common theory is repetitive microtrauma and chronic inflammation of the plantar fascia at its insertion on the medial tubercle of the calcaneus 1-5. Nonoperative treatments for plantar fasciitis vary widely, and include shoe modifications, use of prefabricated and custom inserts, stretching exercises, physical therapy, nonsteroidal anti-inflammatory medications, cortisone injections, night splints, application of a cast, or any combination of the foregoing modalities 6-10. In our institution, the most common conservative treatment is giving a dose of corticosteroid injection directly on the origin of the plantar fascia (medial calcaneal tubercle). Resolution of the symptoms occur in the majority of patients within ten months, but approximately 10% have development of persistent and often disabling symptoms In an initial study by DiGiovanni et al.5, eighty-two patients with chronic proximal plantar fasciitis for a duration of at least ten months completed a randomized, prospective eight-week clinical trial. The patients were divided into a group managed with a plantar fascia-specific stretching protocol and a group managed with an Achilles tendon-stretching protocol. Although improvement was noted in both groups at the time of the eight-week follow-up, the group managed with the non-weight-bearing plantar fascia-stretching protocol was found to have superior results with regard to pain, function, and overall satisfaction compared with those managed with the Achilles tendon-stretching protocol. The major goal of the tissue-specific plantar fascia-stretching protocol was to optimize tissue tension through a controlled stretch of the plantar fascia by recreation of the windlass mechanism (metatarsophalangeal joint dorsiflexion and ankle dorsiflexion). With this study in mind, it is our objective to determine whether the tissue-specific plantar fascia-stretching protocol have a better functional outcome compared to that of a dose of corticosteroid injection.

Methods
Between November 2008 to August 2009, 54 patients (thirty-three men and sixty-eight women) who had chronic heel pain for at least ten months were included in the study. The mean age (and standard deviation) was 46 ± 7.5 years (range, twenty-three to sixty years). All patients complained of maximum pain upon palpation of the origin of the plantar fascia on the medial calcaneal tubercle, consistent with a diagnosis of proximal plantar fasciitis. They had failed to respond to previous non-operative treatments including non-steroidal anti-inflammatory medications, heel inserts, shoe and/or activity modifications. Patients were excluded if they had a history of any systemic disease, prior heel surgery, or heel pain that was not consistent with proximal plantar fasciitis. Verbal and written instructions regarding the study were given to the patients.

Protocol
Initially, patients completed a self-administered questionnaire that provided background information and a history profile of the heel pain which included age, gender, height and weight, hours spent standing during the day, and duration of symptoms. All patients exhibited maximal tenderness with palpation at the origin of the plantar fascia on the medial calcaneal tubercle, confirming a diagnosis of proximal plantar fasciitis. Patients who met the inclusion criteria for the study were then randomized into one of two treatment groups. The sequence of random allocation was concealed until interventions were assigned. Patients in both groups
were advised to wear a prefabricated full-length inserts and prescribed a non-steroidal anti-inflammatory medication. Patients who were randomized to treatment Group A received instructions in a plantar fascia tissue-stretching program. While patients who were randomized into treatment Group B received a dose of corticosteroid (Depo-medrol and lidocaine) injected directly over the origin of the plantar fascia (medial calcaneal tubercle).

**Results**
Fifty-four patients returned for follow-up evaluation. Baseline measures revealed no significant differences between the groups. The pain subscale scores of the Foot Function Index showed significantly better results for the patients managed with the plantar fascia-stretching program Group A has lower heel pain “at its worst” (P<0.0001), after getting up in the morning with the first few steps (P<0.0001), and at the end of the day (P=0.007), compared to group B. Overall, group A has lower pain levels compared to Group B after treatment, P<0.0001. Analysis of the subject relevant outcome measures also revealed significant differences with respect to pain, activity limitations, and patient satisfaction, with greater improvement seen in the group managed with the plantar fascia-stretching program.

**Conclusions**
The major goals of the plantar fascia-stretching protocol were to recreate the windlass mechanism and to limit repetitive microtrauma and associated chronic inflammation by performing the exercises prior to the first steps in the morning or after any prolonged sitting or inactivity. After eight weeks of treatment, the group managed with plantar fascia-stretching exercises exhibited enhanced outcomes with regard to pain, function, and overall satisfaction compared with those of the group managed with corticosteroid injection. Thus, we would like to recommend this protocol, for it provides a cheap, non-operative and non-invasive treatment option that resulted in a rate of improvement of symptoms that surpassed the responses to more traditional treatment methods for patients with chronic, disabling proximal plantar fasciitis.