



Original research

The association of calcaneal spur length and clinical and functional parameters in plantar fasciitis

Ersin Kuyucu ^{a,*}, Figen Koçyiğit ^b, Mehmet Erdil ^a^a Istanbul Medipol University, Faculty of Medicine, Department of Orthopaedics and Traumatology, Istanbul, Turkey^b Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, Turkey

HIGHLIGHTS

- Calcaneal spurs are present in 80% of the patients with plantar fasciitis.
- Calcaneal spur length is significantly correlated with age and BMI.
- Calcaneal spur length is significantly correlated with pain and foot function index score.

ARTICLE INFO

Article history:

Received 15 April 2015

Received in revised form

15 June 2015

Accepted 26 June 2015

Available online 13 July 2015

Keywords:

Roentgenography

Heel spur syndrome

Body mass index

Musculoskeletal disease

ABSTRACT

Introduction: Plantar fasciitis (PF) is the most common cause of plantar heel pain. Despite many treatment alternatives for heel spur, the association of calcaneal spur size with clinical and functional parameters is inconclusive. The objective of this study to investigate the correlation of calcaneal spur length with clinical findings and functional status documented with Foot Function Index in patients with plantar fasciitis.

Methods: We performed power analysis for the sample size estimation. 87 patients with PF were scrutinized to reach the estimated patient number 75. Computer-aided linear measurements were done for spur length from tip to base in millimeters. Perceived pain intensity was evaluated by visual analog scale (VAS). Patients were asked to rate the pain experienced on a 10-cm VAS. Foot function index was applied to the patients to evaluate pain, disability and activity limitation of the patients.

Results: Of the 75 participants, 24 were males (32%) and 51 were females (68%). The mean age was 47 ± 10 years (range 30–65 years). The mean calcaneal spur length was 3.86 ± 3.36 mm (range between 0 and 12.2). Calcaneal spur length was significantly correlated with age ($p = 0.003$), BMI ($p = 0.029$), symptom duration, ($p = 0.001$) VAS ($p = 0.003$), and FFI total score ($p < 0.001$).

Discussion: Our study demonstrated that length of the calcaneal spur is significantly correlated with age, BMI, symptom duration, perceived pain, FFI pain and disability subscores, and FFI total scores.

Conclusion: The size of the calcaneal spur is an important parameter correlated with pain and functional scores in PF.

© 2015 IJS Publishing Group Limited. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Plantar fasciitis (PF) is the most common cause of plantar heel pain in adults [1]. It is estimated that more than 1 million patients seek treatment annually for this condition in United States [2]. Historically, PF was considered an inflammatory syndrome;

however, recent studies have demonstrated a degenerative process [1]. Biomechanical overuse from prolonged standing or running, thus creating microtears at the calcaneal enthesis is responsible for the degeneration of the plantar fascia [3].

Osseous spurring of the plantar aspect of the calcaneus was first documented in 1900 by the German physician Plettner [4]. Anatomically, the plantar fascia originates from the medial tubercle of the calcaneus. The apex of the spur is superior to the plantar fascia in the origin of the flexor digitorum brevis muscle [5]. Repetitive microtrauma is important in the pathogenesis of calcaneal spurs. The presence of other risk factors like obesity, pes planus, pes

* Corresponding author. Istanbul Medipol Üniversitesi, TEM Avrupa Otoyolu Göztepe Çıkışı, No:1, Bağcılar, 34214, Istanbul, Turkey.

E-mail addresses: ersinkuyucu@yahoo.com.tr (E. Kuyucu), figen7876@yahoo.com (F. Koçyiğit), drmehterdil@gmail.com (M. Erdil).

cavus accelerates the injury. Neovascularization and ossification of the resultant scar tissue form the calcaneal spur [6].

Previous studies reported that sub calcaneal spurs were also found in patients without PF. However, recent studies reported calcaneal spur presence in 75.9–89% of patients with plantar heel pain/PF [7,8]. Johal et al. investigated the presence of calcaneal spurs in patients PF and ankle sprain. They reported a significant correlation between calcaneal spur presence and PF. However the association between spur length and functional parameters was not reported in this retrospective study [7]. Akkaya et al. reported a correlation between calcaneal spur presence and functional parameters. Nevertheless the researchers did not explore the effect of spur size.

Therefore, current literature detailing the effect of calcaneal spur dimensions on clinical and functional parameters is inconclusive. Despite the indecisive reported importance of calcaneal spur presence and dimensions, there is a wide range of treatment alternatives for management of calcaneal spur. Therefore, it is important to clarify the effect of spur presence and dimensions on clinical and functional parameters.

The objective of our study is to investigate the correlation of calcaneal spur length with clinical findings and functional status documented with Foot Function Index in patients diagnosed as PF.

2. Materials and methods

The study was approved by the institutional ethics committee. All of the patients gave written informed consent. The study was conducted in accordance with Helsinki Declaration.

2.1. Study population

87 patients who were presented to the institutional outpatient clinic with a primary complaint of plantar heel pain were scrutinized for enrollment in the study to reach the estimated allocation number. Table 1 represents the inclusion and exclusion criteria.

The admission complaint of the involved patients was plantar heel pain. Diagnosis of PF is based on patient history, risk factors (pes planus, pes cavus, sedentary life style, obesity, prolonged walking/standing occupations), and physical examination findings (plantar fascia tenderness, heel pression test). Morning heel pain and tightness after standing up from bed is common in patients with PF. Typically, the heel pain will improve with ambulation [1].

2.2. Outcome measures

We questioned and recorded demographical parameters (age, gender, educational status, employment), dominant and involved sides, symptom duration of the patients. Weight and height were measured and recorded.

We applied heel pression test for diagnosis PF. The pressure was applied to the medial plantar region of the heel. If pain was elicited test was accepted positive. Plantar fascia was palpated for tenderness bilaterally. Other specific tests for neuroma, nerve entrapment, calcaneal stress fracture were performed to rule out these

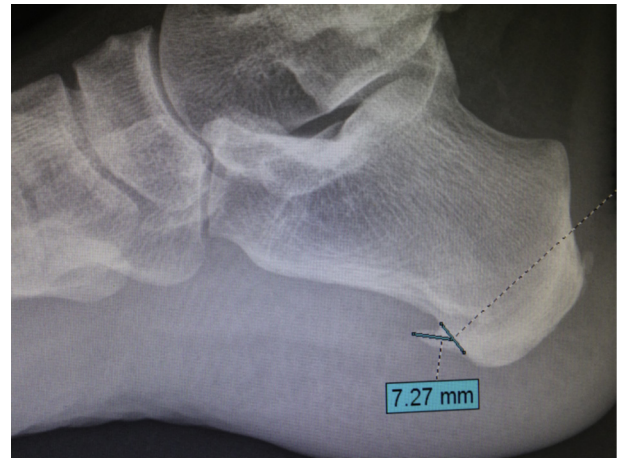


Fig. 1. Lateral calcaneal roentgenogram of demonstrates the calcaneal spur and the measurement method of calcaneal spur length. Two lines are demonstrated. One line demarcating the calcaneal border and another line from the calcaneal border to calcaneal tip.

disorders. Comprehensive physical and neurological evaluations were performed to rule out lumbar radiculopathy, and myofascial pain syndrome is causing plantar heel pain.

Perceived pain intensity was evaluated by visual analog scale (VAS). Patients were asked to rate the pain experienced on a 10-cm VAS.

Foot function index (FFI) was applied to the patients to evaluate pain, disability and activity limitation of the patients. FFI is a self-administered questionnaire that was developed to assess effect of foot disorders on pain, disability and activity limitation. It consists of 3 subscales (pain, disability, and activity limitation) and 23 items. Higher FFI scores indicate poor foot health. It was mostly used in patients with rheumatoid arthritis and PF [9]. Validity and reliability of the Turkish version in PF was documented in 2014 [10].

Lateral calcaneal roentgenogram helps to evaluate bony lesions of the foot in PF although it is not routinely needed initially. Calcaneal spur, recalcitrant PF, calcaneal stress fractures may be visualized on lateral calcaneal roentgenogram [11,12]. We looked for these lesions on the roentgenograms. We recorded present lesions. For all roentgenograms where a spur was present, computer-aided linear measurements were recorded for spur length (mm) from tip to base as defined by a line demarcating the calcaneal border as described by Johal (Fig. 1) [7]. All of the measurements were made by the same researcher (EK).

2.3. Statistical analysis

We performed power analysis for the sample size estimation. Type I error (α) was set at 0.05 and power of the test was selected 0.90 and calculated sample size appropriate to test the hypothesis and have confidence was 75. Statistical analysis was performed with SPSS software, release 21.0 (SPSS Inc. an IBM Company, and Chicago, IL, USA). Standard descriptive statistics was used to

Table 1

Inclusion and exclusion criteria for the study.

Inclusion criteria	Exclusion criteria
Plantar heel pain diagnosed as plantar fasciitis	History of previous ankle/heel fracture/surgery
Requirement of lateral calcaneal roentgenogram for diagnosis and management of plantar fasciitis	Presence of disorder that can affect foot function (Lomber radiculopathy, Achilles tendinitis, Morton Neuroma)
Age between 18 and 65 years	Presence of Inflammatory joint disease
Approval of inclusion in the study	Presence of ankylosing spondylitis or other inflammatory spondylarthropathies

Download English Version:

<https://daneshyari.com/en/article/6250913>

Download Persian Version:

<https://daneshyari.com/article/6250913>

[Daneshyari.com](https://daneshyari.com)