AMERICAN ORTHOPAEDIC FOOT & ANKLE SOCIETY

Relationship and Classification of Plantar Heel Spurs in Patients With Plantar Fasciitis

Foot & Ankle International®
2016, Vol. 37(9) 994–1000

DOI: 10.1177/1071100716649925
fai.sagepub.com

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Abstract

Background: This study classified plantar heel spurs and their relationship to plantar fasciitis.

Methods: Patients included those with plantar fasciitis who were treated from 2012 through 2013. Plantar heel spur shape and size were assessed radiographically and correlated to function and pain before and after treatment. Function and pain were scored with the Foot and Ankle Ability Measures and a visual analog scale, respectively. This study included 109 patients with plantar fasciitis.

Results: The plantar heel spur shape was classified as 0/absent in 26 patients, 1/horizontal in 66 patients, 2/vertical in 4 patients, and 3/hooked in 13 patients. The plantar heel spur size was less than 5 mm in 75 patients, 5-10 mm in 28 patients, and greater than 10 mm in 6 patients. Initially, patients with any shape or size to their spur had no difference in function and pain. With treatment, patients with horizontal and hooked spurs had the greatest improvement in function and pain ($P < .05$). With treatment, patients with larger spurs had the greatest improvement in function and pain ($P < .05$).

Conclusion: Plantar heel spurs can be classified by shape and size in patients with plantar fasciitis. Before treatment, neither the spur shape nor size significantly correlated with symptoms. After treatment, patients with larger horizontal or hooked spurs had the greatest improvement in function and pain. These findings may be important when educating patients about the role of heel spurs with plantar fasciitis and the effect of nonsurgical treatment with certain spurs.

Level of Evidence: Level III, comparative series.

Keywords: plantar, heel, spur, plantar fasciitis

Introduction

Plantar fasciitis is the most common cause of plantar heel pain.[21] Currently, this condition affects 1 in 10 persons at some point in their life.[3] Although the severity of its symptoms varies between individuals, nearly 2 million people seek treatment for plantar fasciitis each year.[15] The etiology of this disease includes both extrinsic and intrinsic conditions. Extrinsic risk factors can include prolonged weight-bearing (WB) activities and wearing improper shoes with minimal arch support.[2] Patients with medical conditions, such as obesity and inflammatory arthropathy, may be predisposed to developing plantar fasciitis.[18]

The first line of imaging for patients with plantar fasciitis usually involves radiographs.[9] Although magnetic resonance imaging (MRI) and ultrasonography (US) allow for direct visualization of the plantar fascia,[6,12] radiographs allow for inspection of calcaneal structural abnormalities that can cause plantar heel pain such as fractures and tumors.[9] One anatomic feature that may appear on radiographs is a plantar calcaneal spur, but it remains controversial as to whether the spur contributes to the symptoms of plantar fasciitis. Some investigators believe that the spur is at the plantar fascia origin, whereas others believe it lies within the plantar foot intrinsic musculature (ie, flexor digitorum brevis).[4,9]

Some investigators believe that heel spur forms from steady traction from adjacent soft tissue progressing to chronic inflammation, periostitis, and osteogenesis of the spur.[22] Some authors describe the plantar calcaneal spurs as a primary or contributory cause of plantar heel pain in patients with plantar fasciitis.[5,7] Other investigators have

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shown that other factors such as plantar fascial thickness and fat pad abnormalities, rather than heel spurs, are more reliably associated with painful plantar fasciitis.[24] Some studies reported large numbers of patients with painless plantar heel spurs,[13,16] and others have discussed patients with painful plantar fasciitis that have no plantar heel spurs.[17]

Although there are limited studies with conflicting findings regarding plantar fascitis and its relationship to plantar calcaneal spurs, there are even fewer that discuss the morphology of the spur itself. In 1957, Duvries described 3 types of plantar calcaneal spurs: (1) large and asymptomatic; (2) large and painful; and (3) small and irregular.[5] However, he did not assess the spurs for their morphology or relationship to plantar fasciitis. Since then, there have been few recent studies that propose any other method of classifying the plantar heel spur. Although there is more literature regarding the incidence of plantar heel spurs in patients with plantar fasciitis, these studies do not provide a definite connection or lack thereof between the 2 conditions.

Clarifying the relationship between plantar heel spurs and plantar fasciitis could be valuable, as it can affect both nonoperative and operative treatment options for either condition. The purpose of this study was to classify the morphology of plantar heel spurs and examine their clinical relationship to plantar fasciitis in 2 physicians' practice at a tertiary care center before and after uniform nonsurgical treatment. We hypothesized that the size and shape of a plantar heel spur would be directly related to pain and/or dysfunction due to plantar fasciitis. We theorized that patients with large horizontal spurs would have worse function and pain before treatment than other types or sizes of spurs. We further postulated that patients with smaller horizontal spurs would have the best improvement in function and pain from nonsurgical treatment than other types or sizes of spurs.

Methods

This study was conducted by retrospectively reviewing medical records and imaging of patients who presented with plantar fasciitis (International Classification of Diseases 9th edition code of 728.71) between January 2012 and December 2013. The primary inclusion criteria were patients with acute plantar fasciitis that had not received any form of recent treatment within 6 months from the time of initial presentation. The diagnosis of plantar fasciitis was confirmed on either MRI or US and then classified as mild, moderate, or severe by a board-certified radiologist. Severity of plantar fasciitis was measured on MRI and US according to the intensity of plantar fascial edema and thickening, respectively.[6,12,14,19,20,23] As a routine practice, patients who presented with plantar heel pain received an MRI to verify the presence of plantar fasciitis. USs were done to diagnose plantar fasciitis in patients who could not receive an MRI for certain medical conditions (ie, the presence of cerebral aneurysm clips or pacemakers). Patients who had no plantar fasciitis on MRI or US were excluded from this study. Furthermore, patients who received recent nonsurgical treatment within 6 months or any [remote or recent] surgery for their plantar fasciitis were excluded from this study.

This study included 109 patients who presented with plantar fasciitis and subsequently received nonsurgical treatment between January 2012 and December 2013. This included 31 men and 78 women, where the mean body mass index (BMI) was 30.9, with a range from 18.1 to 47.7. The right and left foot was affected in 50 and 59 patients, respectively. On initial presentation, patients had symptoms lasting between 0 and 36 months, with a mean duration of 3.1 months.

Patients' records and radiographs before nonsurgical management were retrospectively reviewed. Initial function was scored with the validated 100-point Foot and Ankle Ability Measure (FAAM).[10] Specifically, this measured function was based on a patient's ability to do a wide variety of activities such as standing, walking, stair-climbing, squatting, daily-life activities, light or heavy work, and sports. Initial pain was scored with a validated 10-point visual analog scale (VAS).[1]

A lateral radiograph of the calcaneus was performed for all patients at their initial visit and inspected for the shape and size of plantar heel spur. All study patients received the same treatment algorithm. They were immobilized in a weight-bearing controlled ankle motion (CAM) boot for a minimum of 6 weeks. If patients had unimproved heel pain at that point, they were instructed to wear the CAM boot for another 6 weeks for a total and maximum of 12 weeks of immobilization. No patients were immobilized for longer than 12 weeks. This period of immobilization included sleeping in the boot for those patients who had plantar heel pain at night or at the first onset of activity in the morning. While in the boot, patients were allowed to weight-bear on their affected foot as tolerated. During this time, all patients were allowed to remove the boot for regular bathing or showering and 2 to 3 times daily for stretching of the plantar fascia and Achilles tendon. Patients without plantar heel pain at night or on waking were allowed to remove the boot to sleep. After immobilization, patients were allowed to wean out of the boot and were started in a supervised rehabilitative physical therapy (PT) program for a minimum of 6 weeks. If the patient's therapist had recommended continuing PT at that point, they were prescribed therapy for another 6 weeks for a total and maximum of 12 weeks of PT. No patients were prescribed therapy for longer than 12 weeks. After being immobilized, patients were also fitted for a pair of off-the-shelf arch supports (Lynco, Aetrex, Teaneck, NJ) to wear in their shoes.

All study patients then presented at 6 months after this nonsurgical management for follow-up, which was routine within our practice. At this visit, their records were retrospectively reviewed for any changes in their function and/or pain from treatment. This encounter was the latest one where function and pain were again scored with the FAAM and VAS, respectively.

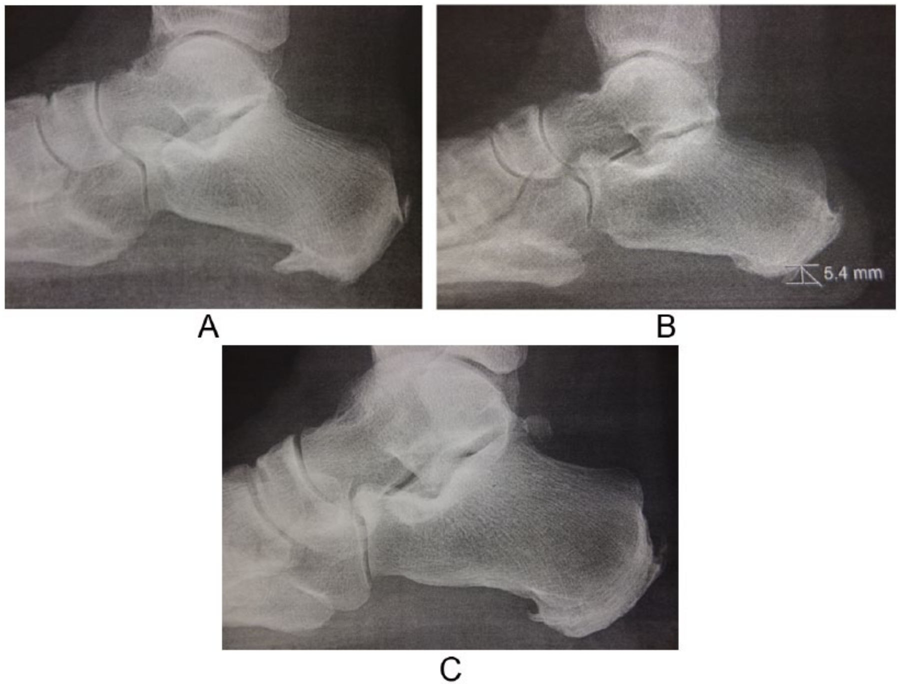

Figure 1. Depictions of a type 1, horizontal (A); type 2, vertical (B); and type 3, hooked (C), plantar heel spur.

Patient function and pain were then correlated to plantar heel spur morphology and size. The Statistical Package for the Social Sciences (version 11.0; SPSS, Chicago, IL) was used for the statistical analysis of data. Analysis of variance was performed to evaluate the significance of differences in data among the study population of patients with different shapes and sizes of their plantar heel spur. A *P* value of less than .05 was defined to be statistically significant. This study was performed with appropriate approval and consent from the Institutional Review Board (IRB) at our practice. No funding was obtained from any outside source in the performance of this study.

Results

The mean FAAM and VAS scores for all study patients were 60.4 (range of 16.7-94) of 100 and 7.3 (range of 3-10) of 10, respectively. The radiographic shape of the plantar heel spur for all study patients was classified into 4 distinct forms: 0 as absent, 1 as a horizontal, 2 as a vertical, and 3 as a hooked shape (Figure 1A-C). Twenty-six patients (23.8%) had a type 0 heel spur, among whom 13, 5, and 8 had mild, moderate, and severe plantar fasciitis on MRI, respectively. The mean initial FAAM and VAS scores for this group was 58.7 (range of 16.7-91.7) and 7.5 (range of 4-10), respectively. Sixty-six patients (60.6%) had a type 1 heel spur, among whom 33, 25, and 8 had mild, moderate, and severe plantar fasciitis on MRI, respectively. The mean initial FAAM and VAS scores for this group were 60.5 (range of 26.2-85.7) and 7.2 (range of 3-10), respectively. Four patients (3.7%) had a type 2 heel spur, among whom 1, 1, and 1 patient had mild, moderate, and severe plantar fasciitis on MRI, respectively. One of these 4 patients was unable to obtain an MRI as she had a pacemaker and instead received an US that showed moderate plantar fasciitis. The mean initial FAAM and VAS scores for this group were 55.8 (range of 32.9-79.8) and 6.8 (range of 5-10), respectively. Thirteen patients (11.9%) had a type 3 heel spur, among whom 9, 3, and 1 had mild, moderate, and severe plantar fasciitis on MRI, respectively. The mean initial FAAM and VAS scores for this group were 65.0 (range of 31-94) and 7.6 (range of 5-10), respectively (Table 1). Based on heel spur morphology, more patients without a spur had significantly worse plantar fasciitis on MRI than patients with a heel spur ($P < .05$). With regard to function and pain, no one type of spur was significantly associated with worse scores than another ($P = .3$) before treatment.

The radiographic size of the plantar heel spur for all study patients was further classified into 3 distinct measurements: less than 5 mm, 5-10 mm, and greater than 10 mm (Figure 2). Seventy-five patients (68.8%) had a spur smaller than 5 mm, among whom 36, 25, and 14 had mild, moderate, and severe plantar fasciitis on MRI, respectively. The mean initial FAAM and VAS scores for this group was 58.9 (range of 16.7-91.7) and 7.3 (range of 3-10), respectively. Twenty-eight patients

Table 1. Patient Demographics Based on Type of Plantar Heel Spur.

Type of Spur	No. of patients	Initial FAAM Score, Mean (Range)	Latest FAAM Score, Mean (Range)	*P* Value	Initial VAS Score, Mean (Range)	Latest VAS Score, Mean (Range)	*P* Value
0 (absent)	26 (23.8%)	58.7 (16.7-91.7)	82.5 (26.2-100)	<.05	7.5 (4-10)	3.2 (0-10)	<.05
1 (horizontal)	66 (60.6%)	60.5 (26.2-85.7)	89.2 (29.8-100)	<.05	7.2 (3-10)	2.0 (0-10)	<.05
				<.05 (from type 2)			<.05 (from types 0 and 2)
2 (vertical)	4 (3.7%)	55.8 (32.9-79.8)	77.9 (32.9-100)	<.05	6.8 (5-10)	3.4 (0-10)	<.05
3 (hooked)	13 (11.9%)	65.0 (31-94)	89.2 (31-100)	<.05	7.6 (5-10)	2.3 (0-7)	<.05
				<.05 (from type 2)			<.05 (from types 0 and 2)

Abbreviations: FAAM, Foot and Ankle Ability Measure; VAS, visual analog scale.

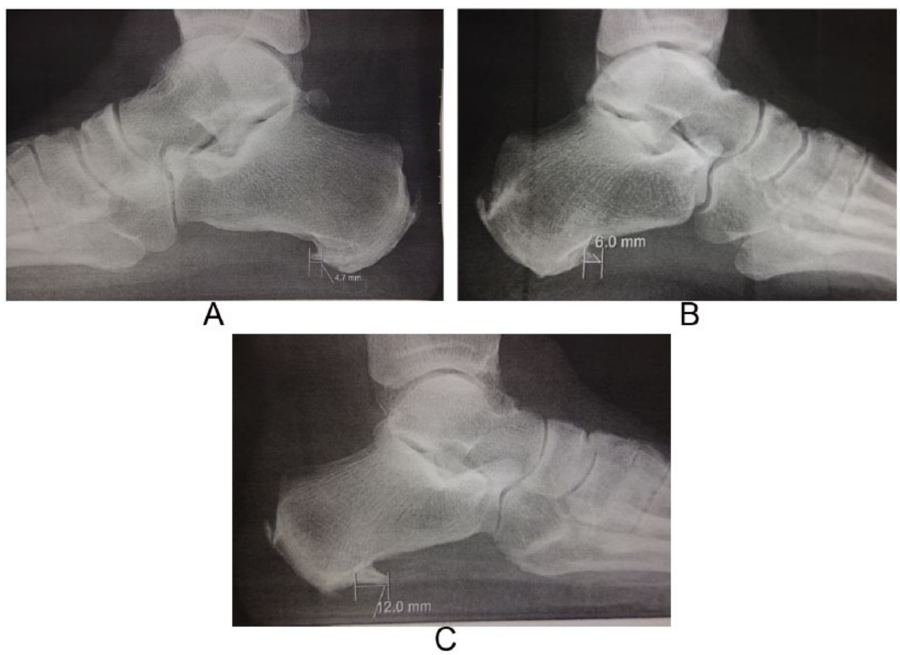

Figure 2. Depictions of a plantar heel spur less than 5 mm (A), 5-10 mm (B), and greater than 10 mm (C).

(25.7%) had a spur between 5 and 10 mm, among whom 16, 7, and 4 had mild, moderate, and severe plantar fasciitis on MRI, respectively. One of these patients was unable to obtain an MRI as she had a pacemaker and instead received an US that showed moderate plantar fasciitis. The mean initial FAAM and VAS scores for this group was 63.1 (range of 39.3-94) and 7.5 (range of 4-10), respectively. Six patients (5.5%) had a spur larger than 10 mm, among whom 4 and 2 had mild and moderate plantar fasciitis on MRI, respectively. The mean initial FAAM and VAS scores for this group was 62.3 (range of 52.4-82.1) and 7.4 (range of 6-9), respectively (Table 2). Based on heel spur size, more patients with smaller spurs had significantly worse plantar fasciitis on MRI than patients with larger spurs ($P < .05$). With regard to function and pain, no one size of spur was significantly associated with worse scores than another ($P = .7$) before treatment.

Following nonsurgical treatment, chart review was performed on all study patients to record any changes in function and pain while taking heed of which patients had which type of plantar heel spur. At the final 6-month visit, patients with a type 0 spur showed an improvement in mean FAAM and VAS scores to 82.5 and 3.2, respectively. After treatment, patients with a type 1 spur displayed better mean FAAM and VAS scores of 89.2 and 2.0, respectively. At the latest encounter, patients with type 2 spurs revealed an improvement in mean FAAM and VAS scores to 77.9 and 3.4, respectively. After treatment, patients with type 3 spurs showed a better mean FAAM and VAS scores to 89.2 and 2.3, respectively. Ultimately, the mean function and pain for patients with any shape to their heel spur significantly improved ($P <$ .05). Compared with each other, those with a horizontal

Table 2. Patient Demographics Based on Size of Plantar Heel Spur.

Size of Spur	No. of patients	Initial FAAM Score, Mean (Range)	Latest FAAM Score, Mean (Range)	*P* Value	Initial VAS Score, Mean (Range)	Latest VAS Score, Mean (Range)	*P* Value
<5 mm	75 (68.8%)	58.9 (16.7-91.7)	85.6 (29.8-100)	<.05	7.3 (3-10)	2.6 (0-10)	<.05
5-10 mm	28 (25.7%)	63.1 (39.3-94)	91.8 (31-100)	<.05 <.05 (from spurs less than 5 mm)	7.5 (4-10)	1.7 (0-10)	<.05 <.05 (from spurs less than 5 mm)
>10 mm	6 (5.5%)	62.3 (52.4-82.1)	93.7 (59.5-100)	<.05 <.05 (from spurs less than 5 mm)	7.4 (6-9)	1.2 (0-8)	<.05 <.05 (from spurs less than 5 mm)

Abbreviations: FAAM, Foot and Ankle Ability Measure; VAS, visual analog scale.

Table 3. Patient Demographics Based on Severity of Plantar Fasciitis From Magnetic Resonance/Ultrasonographic Imaging.

Severity of Plantar Fasciitis	No. of patients	Initial FAAM Score, Mean (Range)	Latest FAAM Score, Mean (Range)	*P* Value	Initial VAS Score, Mean (Range)	Latest VAS Score, Mean (Range)	*P* Value
Mild	56 (51.4%)	63.0 (16.7-94)	86.5 (31.0-100)	<.05	6.9 (4-10)	2.7 (0-10)	<.05
Moderate	35 (32.1%)	58.3 (29.8-85.7)	83.8 (29.8-100)	<.05	7.3 (4-10)	2.8 (0-10)	<.05
Severe	18 (16.5%)	53.8 (26.2-91.7)	87.5 (59.5-100)	<.05	7.3 (3-9)	2.5 (0-8)	<.05

or hooked spur showed significantly greater improvement in function and pain ($P < .05$).

An analysis of these patients' records was also performed to record any changes in function and pain while observing which patients had which size of plantar heel spur. At 6 months after treatment, patients with spurs smaller than 5 mm displayed better mean FAAM and VAS scores of 85.6 and 2.6, respectively. At the latest encounter, patients with spurs between 5 and 10 mm revealed an improvement in mean FAAM and VAS scores to 91.8 and 1.7, respectively. At the final visit, patients with spurs larger than 10 mm showed better mean FAAM and VAS scores of 93.7 and 1.2, respectively. Ultimately, the mean function and pain for patients with any size to their heel spur significantly improved ($P < .05$). When compared to spurs smaller than 5 mm, those with spurs larger than 5 mm showed significantly greater improvement in function and pain ($P < .05$).

Further chart review was conducted to document any variations in function and pain while noting the severity of plantar fasciitis that patients had on MRI and/or US (Table 3). Fifty-six (51.4%), 35 (32.1%), and 18 (16.5%) patients had mild, moderate, or severe plantar fasciitis, respectively, before receiving treatment. The mean initial FAAM scores for patients with mild, moderate, and severe plantar fasciitis were 63.0 (range of 16.7-94), 58.3 (range of 29.8-85.7), and 53.8 (range of 26.2-91.7), respectively. The mean initial VAS scores for patients with mild, moderate, and severe plantar fasciitis were 6.9 (range of 4-10), 7.3 (range of 4-10), and 7.3 (range of 3-9), respectively. At 6 months after treatment, the FAAM increased to 86.5, 83.8, and 87.5 for those with mild, moderate, and severe plantar fasciitis, respectively. At 6 months from treatment, the VAS decreased to 2.7, 2.8, and 2.5 for those with mild, moderate, and severe plantar fasciitis, respectively. Compared with initial function and pain values, all study patients with varying intensities of plantar fasciitis had a statistically significant improvement in function and pain with treatment ($P < .05$). However, the differences between the latest mean function and pain scores between patients with different degrees of plantar fasciitis were not statistically significant.

Discussion

Although plantar fasciitis is the most common cause of plantar heel pain, the role of a plantar calcaneal spur and its effect on patient symptoms remain controversial. Menz et al showed that patients with a heel spur were likely to have or had heel pain.[11] Likewise, Johal et al noted a significantly higher prevalence of heel spurs in their cohort of patients with plantar fasciitis (89%) compared to those without (32%).[7] Osborne et al found plantar heel spurs in 85% of patients with and 46% of patients without plantar fasciitis. However, they concluded that it was the plantar fascial thickness and fat pad abnormalities that were more reliably associated with plantar fasciitis and not plantar heel spurs.[16]

Other investigators have found less significant or definite correlations between plantar fasciitis and heel spurs. Although Moroney et al discovered a connection between calcaneal spurs and heel pain, it was independent of the presence of plantar fasciitis.[13] Vyce et al showed that as many as 11% to 16% of young or middle-aged adults have a plantar heel spur that is painless.[22]

Although there are some studies regarding plantar fascitis and its relationship to plantar calcaneal spurs, there are only a few regarding the morphology of the spur itself. Historically, Duvries described 3 types of plantar calcaneal spurs: (1) large and asymptomatic; (2) large and painful; and (3) small and irregular.[5] More recently, Kuyucu et al assessed the size of plantar heel spur in patients with plantar fasciitis.[8] With a population of 75 patients, they found that those with larger spurs had significantly worse pain and function than those with smaller spurs. Rather than use size, Zhou et al classified plantar heel spurs based on the spurs' anatomic location in their recent prospective study of 30 patients with plantar fasciitis and heel spurs.[25] They described 2 types of heel spurs seen endoscopically: type A and B located above and within the plantar fascia, respectively. They found that those with type B spurs had significantly worse plantar fasciitis on MRI and physical examination than those with type A spurs. However, none of these authors classified the morphology of the plantar heel spur, its relationship to plantar fasciitis, or its response to any form of treatment.

Within our study population, we were able to classify the morphology of plantar heel spurs in patients with plantar fasciitis with a reliable and reproducible system. We classified spurs into 4 shapes: 0 or absent, 1 or horizontal, 2 or vertical, and 3 or hooked. From highest to lowest incidence, patients had type 1 (60.6%), type 0 (23.9%), type 3 (11.9%), and then type 2 (3.6%) spurs. The size of these spurs was measured to be 0-5, 5-10, and greater than 10 mm. From highest to lowest incidence, patients had spurs of 0-5 mm (68.8%), 5-10 mm (25.7%), and then larger than 10 mm (5.5%).

Ultimately, our original hypothesis of a direct relationship between plantar heel spur size and shape with plantar fascial dysfunction and/or pain was proven wrong. Patients with large horizontal spurs did not have worse function and pain before treatment than other types or sizes of spurs. Any given patient with a particular shape or size of their heel spur did not have significantly worse function and pain than any other patient. Rather, patients with absent or smaller spurs had significantly worse plantar fasciitis on MRI than those with any larger spur upon initial presentation. This suggests that the plantar heel spur is not the source of inflammation and/or pain with plantar fasciitis. Rather, the spur seems to be an incidental radiographic finding. Larger heel spurs may be an indicator of a patient's history of having been afflicted with plantar fasciitis, whether it has been recurrent or long-standing. However, this possibility would require further study for its validation.

Function and pain for all of our study patients were then reviewed before and after receiving nonsurgical treatment. After nonsurgical treatment, differences could be seen between our study patients with different shapes and sizes of heel spur. Our hypothesis that patients with smaller horizontal spurs would have the best improvement in function and pain from nonsurgical treatment than other types or sizes of spurs was proven wrong. Rather, patients with a horizontal or hooked spur showed significantly greater improvement in function and pain than those with absent or vertical spurs ($P < .05$). In addition, patients with spurs larger than 5 mm showed significantly greater improvement in function and pain ($P < .05$) over those with spurs smaller than 5 mm.

These findings suggest that the plantar heel spur is not necessarily the source of inflammation and/or pain with plantar fasciitis. Having a vertical heel spur correlated with less success from nonsurgical treatment. Perhaps, the vertical heel spur physically irritates the plantar fascia through its plantar direction. This does not appear to be the case with horizontal or hooked spurs, where those spurs present as an incidental radiographic finding. Larger heel spurs may be an indicator of a patient having been affected with chronic, but episodic and/or treatable, plantar fasciitis, which can resolve through means of decreasing inflammation. Such methods would include immobilization, activity modification, and therapeutic exercise such as those we utilized to resolve patients' plantar fasciitis and improve their function and pain. However, this possibility would require further study for its validation.

The primary objective of this study was to assess the radiographic morphology and size of plantar heel spurs and their clinical relationship to plantar fasciitis before and after treatment. However, we also examined the degree of plantar fasciitis on MRI and/or US for any potential relationship with pretreatment and/or posttreatment function and/or pain. All study patients had statistically significant better function and pain with treatment ($P < .05$) whether their plantar fasciitis was mild, moderate, or severe on MRI and/or US. However, we found no significant correlation between the severity of plantar fasciitis on MRI and/or US and any differences within either initial or latest mean function and pain scores among patients with different degrees of plantar fasciitis. These results may be affected by discrepancies within our study population such that 51.4%, 32.1%, and 16.5% of patients had mild, moderate, or severe plantar fasciitis, respectively, before receiving treatment. Therefore, we acknowledge that further study with larger patient populations may be needed to confirm the lack of a significant relationship we found between severity of plantar fasciitis on MRI and/or US and pre-treatment and post-treatment function and pain.

We acknowledge the limitations of this study. We acknowledge that many patients did not have spurs that were vertical (type 2) or larger than 10 mm. A greater amount of patients with these types of spurs may have affected the statistical significance of our results. Because our study patients received nonsurgical management, there may be confounding factors if some patients were more adherent to instructions than others. Some patients may have used their CAM boot, home exercises, and/or orthotics more than others, which could have affected the success rates with such treatment. As our study was retrospective, the final scoring of function and pain for patients was done at their routine 6-month visit after the start of treatment. Conducting this study in a prospective manner with longer follow-up may have an effect on final function and/or pain scores. As our study was noncomparative, we did not assess the morphology or size of plantar heel spurs in patients without plantar fasciitis. A comparison to patients without plantar fasciitis was outside the scope of this study, but may provide direction for future investigation.

Conclusion

This study demonstrated that the plantar heel spur could be classified based on shape and size in patients with plantar fasciitis. Before treatment, neither the spur shape nor size was found to significantly correlate with different levels of patient function and pain. After treatment, those with a horizontal or hooked spur showed the greatest improvement in function and pain. When compared to spurs smaller than 5 mm, those with spurs larger than 5 mm showed significantly greater improvement in function and pain ($P < .05$). These findings may be important when educating patients about the role of plantar heel spur in the presence of plantar fasciitis. Patients can be informed that those with small spurs may have just as much plantar heel pain as those with large spurs before receiving treatment. Patients can also be reassured that those with horizontal, hooked, or large spurs can improve with nonsurgical treatment.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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