

RESULTS OF HEEL SPUR SURGERY

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Plantar heel pain is a common complaint of many patients presenting to the podiatric physician. While this syndrome is usually treated successfully on a conservative basis, there remains a small minority of patients who will require surgery after conservative means have been exhausted.

Heel pain may be caused by bursitis, fasciitis, tendinitis, periostitis of the heel and/or spur formation, nerve entrapment, abnormal foot mechanics, systemic conditions, or a combination of these factors.¹ In patients free of arthritic disease, heel pain is most often the result of a biomechanical abnormality.² The common denominator of biomechanically induced heel spur syndrome is elongation and stretching of the plantar fascia, especially at its insertion into the calcaneus. Hauser³ stated that "the constant pull of fascial and muscular attachments to bone" is what causes the spur to develop. This excess stress of the plantar fascia causes new connective tissue to be produced at the calcaneal tubercles. With time, this new connective tissue changes from fibrocartilage to cartilage, and finally to bone.⁴

Various types of conservative treatment have been recommended prior to surgical intervention. The authors' belief is to extend conservative therapy for six months to one year before resorting to surgical intervention. These modalities may include padding, taping, heel cups, casting, special shoes, orthotics, stretching, injections of local anesthetics and hydrocortisone, anti-inflammatory drugs, and/or physical therapy. Meltzer⁵ developed the "90-90 Rule": 90% of his patients with heel pain are discharged approximately 90% better than they were when they first sought treatment.

Many surgical procedures have evolved in the past eighty years beginning with Griffin⁶ in 1911 who used a U-shaped incision around the posterior aspect of the heel to expose the plantar calcaneus by creating a full thickness skin graft. Steindler⁷ used an osteotome and rasp to excise the spur through a medial incision. In 1938 Steindler and Smith⁸ designed a rotational osteotomy of the calcaneus with a tendo achillis lengthening that

attempted to alter the weight bearing attitude of the calcaneus. Michele and Krueger in 1951⁹ utilized a countersinking osteotomy of the calcaneus to diminish the weight bearing load of the calcaneal tubercle.

Duvries¹⁰ in 1957 performed the forerunner to today's common technique of a medial linear incision to deinsert the plantar fascia and remove the spur. In 1970 Mercado¹¹ and Fisher¹² advocated osteotripsy techniques where a small medial incision is used to remove the spur by rasping. Calcaneal decompression was introduced by Hassab and El-Sherif¹³ in 1974 where multiple drill holes were made in the calcaneus from the medial to lateral cortex.

More recently, in 1983, Michetti and Jacobs¹⁴ used a plantar midline incision to gain exposure to a subcalcaneal soft tissue mass they identified 80% of the time. A fasciotomy and spur excision were performed concomitantly. Baxter and Thigpen¹⁵ in 1984 advocated a neurolysis of the mixed nerve supplying the abductor digiti quinti muscle as it passed beneath the abductor hallucis muscle and the medial ridge of the calcaneus.

A retrospective study by Contompasis¹⁶ in 1974 showed some postoperative improvement in 82% of patients who had undergone a fasciotomy and excision of the heel spur from a medial approach. This 82% was further broken down to 43% who received complete improvement and 39% who demonstrated improvement to a lesser degree. In patients with a fasciotomy alone, less than 20% became completely asymptomatic.

Numerous studies have demonstrated varying outcomes of surgical treatment of heel spurs. Mann¹⁷ found that the surgical treatment of calcaneal spurs gave 50%-60% satisfactory results. Chrisman and Snook¹⁸ reported complete success of seven patients (eight painful heels) only after a two to seven year follow up. Ali¹⁹ reported a plantar fasciotomy provided permanent relief in 75%, and fasciotomy with excision of the spur produced a resolution of symptoms in 85%.

Today many of the previously proposed surgical procedures have been abandoned in favor of the more conservative medial approach presented initially by DuVries. This open approach is basically the one utilized by the majority of the podiatric staff at Northlake Regional Medical Center, and is described in *The Comprehensive Textbook of Foot Surgery*.²⁰ The key points to remember in this technique are not to undermine the flaps, to utilize sharp and blunt dissection to isolate the plantar fascia, to cleanly dissect the fascia from its insertion into the intracalcaneal exostosis, and to resect the spur in toto. Another key element is the use of closed suction drainage. Drains are well suited to this procedure due to the difficulty of acquiring adequate hemostasis, and the creation of dead space following closure.

Twenty-three (23) patients (28 heel spurs) who had heel surgery performed at our institution were asked to reply to a questionnaire. Each individual was questioned at least one year post surgery. All of the patients had undergone a plantar fasciotomy with excision of the heel spur through a medial approach. Variables included orientation of the medial incision, and the instrumentation used to resect the spur. The purpose of the study was to determine the efficacy and patient satisfaction of heel spur surgery.

The majority of the patients (79%) subscribed to surgery because of severe pain. Words often used to describe the pain were sharp, burning, aching, "like a nail in my heel." The patients were asked to grade the pain on a scale of 1 to 10, with 10 being the most severe pain. Twelve of the twenty three answered with a 10 while the remainder responded with no grade below a 7. Most of the patients worked on their feet for eight or more hours a day. Interestingly, several patients (three) had desk jobs and stood or ambulated a limited amount daily. Concrete and mixed floor coverings were cited evenly as the most common type of work surfaces encountered. Sixty-nine percent of the population considered themselves overweight.

All of the patients had unsuccessful attempts at conservative therapy including; oral anti-inflammatory medication (38%), injections (82%), stretching (8%), taping (35%), heel cups (57%), and orthotics (53%).

When asked if their heel pain was alleviated with surgery, 17 (74%) answered favorably, 4 (18%) said no, and 2 (8%) said they received partial relief. 8 (26%) of the respondents reported an extremely successful result, while 9 (38%) said they were better than expected, and 4 (18%) said that their results were as expected (i.e.: experienced some postoperative discomfort, but it was

less than the preoperative pain). 4 (18%) claim they were worse than expected following the surgery.

The respondents were then asked how their heel felt at the time of the survey. 9 (38%) claimed they no longer have pain. 4 (18%) related less pain than before the procedure. A large portion, 8 (36%) were still experiencing pain at certain times, and 2 (8%) live with chronic pain at all times.

The patients were then asked how long it took for them to fully recover following surgery. The answers ranged from 5 weeks to 1.5 years. Three patients did not feel they were fully recovered at 1 and 2 years postoperative. The average recovery time was between 4 and 6 months.

The most frequent complication was numbness around the incision and medial heel experienced in 10 (43%) patients. 7 (31%) experienced a delayed healing of the incision. Persistent swelling around the medial heel was noted by 4 (18%), and only one patient claimed her arch depressed following surgery. No patient noticed contracted or hammered digits. One patient relates he required hospitalization for phlebitis of the involved extremity following surgery.

When asked if they would have the procedure repeated on the contralateral extremity 17 (74%) said yes, 5 (22%) said no, and 1 patient was undecided. A majority of 19 (82%) said they would recommend the procedure to a friend with a similar problem while 4 (18%) would not recommend the procedure.

This study confirms that heel spur surgery is successful in the majority of patients. However, the study reflects a failure rate similar to findings in the general medical literature of approximately 10%-30%. This continues to be a disturbing level.

Violation of the plantar fat pad may be a cause of failure for heel spur surgery. Miller²¹ reported that the fat pad on the heel could be envisioned as a hydraulic piston composed of elastic adipose tissue. If the septa of the elastic strands of adipose are disrupted, the hydraulic system fails. Unlike the reparative process present elsewhere in the body, remodeling and restoration of the original fat pad complex does not occur.

Nerve involvement, i.e. nerve entrapment, and developmental neuroma of the medial calcaneal nerve are also likely causes of failure. Baxter and Thigpen¹⁵ accomplished a successful surgical result in 32 of 34 patients. Their hypothesis was to isolate the nerve to the

abductor digiti quinti just distal and deep to the calcaneal tuberosity and deep to the abductor hallucis muscle. The nerve is then freed proximally by releasing the deep fascia of the abductor hallucis muscle until the nerve is no longer impinged. They further relate that it is possible for the nerve to the abductor digiti quinti to be inadvertently destroyed during procedures involving heel spur excision. This is a theoretical means by which pain relief may be achieved.

Beito, Krych, and Harkless²² surgically excised the medial calcaneal nerve as it coursed into fibrous tissue just distal to the calcaneal tuberosity. Histologically, the nerve branch was encased in chronic fibrosis in all but one case (lipoma). The authors believe that the normal nerve becomes entrapped in this fibrous mass and secondary fibrosis, degeneration, and possible perineural fibroma (neuroma) develop. The postoperative complication of a transected medial calcaneal nerve producing a stump neuroma within a painful scar is also a distinct reason for surgical failure.

A subcalcaneal soft tissue mass was found in over 80% of the patients operated on by Michetti and Jacobs.¹⁴ Therefore, they utilized a plantar, midline incision to gain access to the plantar calcaneal anatomy and to excise the soft tissue mass. This mass has been described as a thickened, hyalinized bursa, or a hyalinized connective tissue with pseudo-cartilaginous material.

Many reasons for failure exist in mere execution of the relatively simple medial technique. Aggressive resection of the spur can lead to stress risers that can eventually fracture. Poor tissue visualization and handling may result in sectioning of the flexor digitorum brevis or the abductor digiti quinti muscles with resultant hematoma. Heel spur surgery must be meticulous and it should only be considered after conservative therapies have been exhausted.

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