



ORIGINAL RESEARCH PAPER

Surgery

ANALYSIS OF FUNCTIONAL OUTCOME OF SURGICAL DECOMPRESSION OF CHRONIC RETROCALCANEAL BURSTITIS

KEY WORDS:

Balaji Subramaniam

ABSTRACT

INTRODUCTION: Haglund deformity is a common cause of posterior heel pain and consists of a constellation of soft tissue and osseous abnormalities. The treatment starts with conservative approach and ends with surgical treatment in case conservative treatment fails and the symptoms are bothersome. Different surgical procedures and approaches have been used for this deformity. In this study we evaluated the clinical and functional outcome of osteotomy of the calcaneal tuberosity with debridement of the retrocalcaneal bursa and the Achilles tendon using a lateral approach at our institute

METHODS: This prospective study consists of 15 heels (5 men, 10 women) with mean age of 40 years who were operated at Vinayaga mission medical college and hospital ,karaikal from June 2019 to May 2020 with posterior heel pain, who did not respond to conservative treatment and underwent surgical decompression of the retrocalcaneal bursae and excision of bony spurs. The functional outcome was evaluated by comparing the pre and postoperative American Orthopedic Foot and Ankle Society (AOFAS) scores and VAS score at 6th month and one year follow up

RESULTS: All patients were followed up for at least 12 months. AOFAS scores showed significant improvement at 6th months & one year follow up . 1 out of 15 operated feet had superficial surgical site infection in the postoperative period that responded to antibiotic therapy and regular dressings

CONCLUSION: Open **surgical decompression** is a safe and effective technique. We conclude lateral approach to debridement and calcaneal tuberosity resection is an effective method with good clinical and functional outcome in patients with refractory Haglund deformity.

INTRODUCTION

Patrick Haglund (1928) was credited for the first description of enlargement of the posterosuperior portion of the calcaneus; [3] the syndrome bearing his name has come to represent a painful condition of the heel caused by mechanically induced inflammation of the retrocalcaneal and / or supracalcaneal bursae, which become inflamed, hypertrophied, and adherent to the underlying tendon. [4]

Achilles tendinopathy is a common hind foot disorder which affects both the active and non-active population. It's occurrence among Asians has shown an increasing trend due to their active involvement in sporting activities but limited literature is available documenting on Achilles tendinopathy. It can be classified as insertional and non-insertional tendinopathy [1]. Insertional tendinopathy is responsible for 20% to 25% of total Achilles tendon related disorders [2] and usually associated with retrocalcaneal bursitis.

The scientific evidence of the etiological factors is limited. The suggested pathophysiology is excessive loading during exercise or recurrent microtrauma leading to tendon damage [5]. The risk factors can be either intrinsic or extrinsic. Intrinsic factors include tendon vascularity, gastrocnemius-soleus dysfunction, age, gender, obesity, hypertension, diabetes mellitus, dyslipidemia, pes cavus and lateral ankle instability [6]. Meanwhile, extrinsic factors are changes in training pattern, poor technique, previous injuries, footwear and training on hard, slippery or slanting surfaces [2,7].

This disorder is initially treated with non-operative treatment. Patients are advised for complete or modified rest and correction of possible intrinsic or extrinsic risk factors that may contribute to pain.

Adequate analgesia, local injection of sclerosing agents, physiotherapy to strengthen the triceps surae muscles and orthotic treatment like shoes change or heel lift have shown some symptomatic improvement [8]. McGarvey et al. [9] have shown that 89% of their patients improved with non-operative treatment.

Surgical intervention is recommended for failed non-operative treatment. The surgical principle involves removal of the inflamed bursa, thickened synovium and resection of postero-superior part of calcaneum. There are many surgical options available such as open and endoscopic method with good to excellent outcomes.. American Orthopaedic Foot and Ankle Society (AOFAS) hind foot scoring system, and visual analogue scale were used to evaluate the patient's outcome.

MATERIALS AND METHODS

This prospective study consists of 15 patients (5 men, 10 women) with mean age of 40 years who were operated at Vinayaga mission medical college and hospital ,karaikal from June 2019 to May 2020, with posterior heel pain, who did not respond to conservative treatment and underwent surgical decompression of the retrocalcaneal bursae and excision by calcaneal osteotomy.

All patients were discharged on the following day and allowed weight bearing as tolerated. The functional outcome was evaluated by comparing the pre and postoperative American Orthopedic Foot and Ankle Society (AOFAS) scores and visual analogue scale

Radiology

A standing, lateral view of plain X-ray was taken preoperatively, to assess the posterosuperior bony spur, [10] (which was present in all patients) and to calculate the extent of bony resection required.

The parallel pitch lines (PPLs) determine the prominence of the bony projection on preoperative X-ray. The lower PPL (A) is the baseline, drawn from the anterior tubercle to the medial posterior tubercle. The upper PPL (B) is drawn parallel to the baseline at a distance D, starting from the talar articular surface anteriorly to the posterior tuberosity.

A bony projection touching or below line B is normal and not prominent (PPL-negative) and a bony projection above B is considered prominent (PPL-positive), which needs surgical excision. Both preoperative and postoperative x-rays were compared, to determine the extent of resection.



Preoperative X-ray ankle joint lateral view showing (a) the parallel pitch lines (PPLs) determine the prominence of the bony projection. (b) Ultrasound ankle showing Achilles Tendon, Retrocalcaneal bursa and Calcaneum

Scoring

The AOFAS ankle-hindfoot scale was used to evaluate patients preoperatively and postoperatively at three weeks, six weeks, six months, and twelve months respectively. The AOFAS score evaluates pain (40 points), function (50 points), and alignment (10 points). [11].

Both preoperative and postoperative evaluations were performed by a single investigator, to avoid interobserver errors.

Statistical analysis

The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 11.0. Frequencies and proportions were calculated and the mean (\pm Standard Deviation) values were calculated for continuous variables, such as, age, duration of conservative treatment before surgery, preoperative and postoperative scores, duration of surgery, and followup.

Operative procedure

Place the patient prone. After administration of general or local anesthesia, make a longitudinal lateral incision 1 cm lateral incision 1 cm lateral to the Achilles tendon, extending distally from 3 to 4 cm proximal to the superior tuberosity of

the calcaneus to 2 to 3 cm distal to the superior tuberosity of the calcaneus

Plantar flex the ankle joint and by sharp and blunt dissection, identify the Achilles tendon

Place a right-angle retractor between the Achilles tendon and posterior and superior borders of calcaneal tuberosity. With the plantar flexed, this usually affords enough exposure to remove the superior border of calcaneal tuberosity without raising any of the Achilles tendon of the calcaneus. However, the Achilles tendon has such an extensive insertion into the posterior and plantar aspect of the calcaneal tuberosity that rising 1 to 2cm long portion of the tendon. Maybe necessary to resect the bone adequately.

Remove the superior aspect of the tuberosity with a micro sagittal saw or an osteotome. Placement of several drill holes along the proposed osteotomy site makes this resection easier. Lavage the wound and close in layers.

Operative Photographs :



RESULTS

Age

Majority of the subjects were in the age group of 40-45 years, Mean age of the subject was 41 years.

Age	Number of Subjects	Percentage
Less than 35 years	2	
35 - 40 years	2	
40 – 45 years	6	
45-50 years	5	

Gender

Majority of the subjects were females (60%, 10 Subjects) and 40% were males.

Pre-operative and Post-operative comparison of AOFAS Score

The AOFAS Hind Foot Scoring is based pain (40 points), function (50 points) and alignment (10 points). The mean AOFAS score improved from pre-operative score of 48.48 (range, 32-58) to post-operative score of 73.0 (Range, 67-77) at 1 months and 89.3 (range, 85-100) at 6 months. Wilcoxon signed rank analysis showed significant AOFAS scores with p values of 0.005 at 3 months and 6 months. Only one out of 35 patients had daily pain at 6 months follow up and could be due to scar tenderness.

Results of AOFAS Hind Foot Scoring.

AOFAS Score	Mean	Standard Deviation	P Value
Preoperative AOFAS Score	48.48	9.984	<0.005
Postoperative AOFAS Score	89.36	4.319	<0.005

Pre-operative and Post-operative comparison of VASS Score

In our study majority of subjects were graded poor pre-operatively whereas post-operatively the majority had improved, to have an excellent grade.

VASScore	Mean	Standard Deviation	P Value
Preoperative VASScore	8.92	1.077	<0.001
Postoperative VASScore	1.44	1.158	<0.001

Complication

There were no complications in the study.

DISCUSSION

The treatment of Haglund's syndrome resultant from Haglund's deformity remains a significant orthopaedic challenge. Many patients do not respond to conservative treatment, leaving surgery as a last alternative. The various surgical methods described to treat this syndrome have, however, produced mixed results, making it difficult for physician and patient alike to decide under what circumstances and with what methods to intervene surgically (12,13,14,15).

The results of the current study suggest that calcanealostectomy produces outcomes that justify surgical intervention in cases of Haglund's syndrome calcitrant to conservative therapy. Mean AOFAS scores for patients in this study were 89/100. Furthermore, 86% of the patients interviewed responded that they would repeat the procedure, and 82% responded that they would recommend the procedure to others suffering from Haglund's deformity related heel pain.

The results presented are similar to outcomes previously reported by Sella *et al* (19) using the AOFAS score. The results presented by the current investigators and by both Sammarco *et al* (17) and Sella *et al* (19) are in contradistinction to other studies, including those of Nesse *et al* (16) and Schneider *et al* (18) that suggest the resection of calcaneal exostosis does not result in consistent symptomatic relief for patients. The discrepancy between the two opinions may be multifactorial, reflecting both time to follow-up, outcome evaluation tools, and surgical procedure.

The current authors' method of calcaneal ostectomy may also have contributed to the satisfactory outcomes reported. A preoperative assessment is critical to determine the site of greatest pain.

Usually, this is not midline but rather posterior medial or posterior-lateral and, as such, the surgical exposure should be directed towards this site. Careful periosteal dissection over the calcaneal prominence may also reduce the incidence of postoperative neuromas from small periosteal nerves and from bony proliferation from the periosteum itself (20).

Adequate bony resection is also critical to satisfactory outcomes. Enough bone should be resected to allow decompression of the tendon and the retro calcaneal bursa itself. This has previously been established as a critical step in obtaining long term pain relief (19). The current authors have found that this can only be achieved with a two step ostectomy. The initial ostectomy removes the dorsal prominence, uncovering the posterior prominence. After this has been resected the current authors close the skin and feel for any prominence through the skin. If any is present it is resected with a small rongeur. This, the authors believe is a critical step in eliminating symptoms.

Although the current authors are encouraged by recent reports on the use of arthroscopic resection of Haglund's deformity there is little evidence to date to suggest that this method of treatment has any significant benefit over that of traditional open resection (21). Of greatest concern is the possibility of neuroma formation from traumatic periosteal resection. Furthermore, the bony debris generated at the time of resection may cause long term irritation to the soft tissues unless meticulous irrigation is obtained. Further refinements of the arthroscopic approach are demonstrating improved

techniques and outcomes. Until such techniques are perfected however, the authors believe that the current method of traditional surgical resection presented in the present study, may represent the benchmark of treatment to which future studies of endoscopic resection may be compared.

Certain confounding variables were identified in this study. It is a retrospective review and as such has inherent bias. In an effort to reduce bias the senior authors did not collect data, and all data was collected from consecutive patients to avoid selection bias. The retrospective nature of this study and the recollection of patients as to the length of time to recovery however only underscore the message of this investigation ; patients were concerned mostly about the lengthy time to recovery.

Haglund's deformity is a challenging condition to treat. This study adds to the evidence that calcaneal ostectomy can be an effective treatment for those suffering from chronic heel pain for whom conservative therapy fails. Patients should be made aware however that there is a significant period of recovery required before they will obtain maximum benefit.

Abbreviations: AOFAS: American Orthopedic Foot and Ankle Society; VAS: visual analog scale

REFERENCE

- McGarvery 1. [PMC free article] [PubMed] WC, Palumbo RC, Baxter DE, Leibman BD (2002) Insertional Achilles tendinosis: surgical treatment through a central tendon splitting approach. *Foot Ankle Int* 23(1): 19-25.
- van Sterkenburg MN, Muller B, Maas M, Sierevelt IN, van Dijk CN. Appearance of the weight-bearing lateral radiograph in retrocalcaneal bursitis. *Acta Orthop*. 2010;81:387-90.
- Alberto Selvanetti, Massimo Cipolla, Giancarlo Puddu (1997) Oversue tendon injuries: basic science and classification. *Operative techniques Sports Med* 5(3): 110-117.
- Maffulli N, Sharma P, Luscombe KL (2004) Achilles tendinopathy: aetiology and management. *J R Soc Med* 97(10):472-476.
- Kader D, Saxena A, Movin T, Maffulli N (2002) Achilles tendinopathy: some aspects of basic science and clinical management. *Br J Sports Med* 36(4): 239-249.
- Kitaoka HB, Alexander IJ, Adelaar RS, Nunley JA, Myerson MS, Sanders M. Clinical rating systems for the ankle-hindfoot, midfoot, hallux, and lesser toes. *Foot Ankle Int*. 1994;15:349-53. [PubMed]
- Scioli MW (1994) Achilles Tendinitis. *Orthop Clin N Am* 25(1):177-182.
- Kvist M (1991) Achilles tendon injuries in athletes. *Ann Chir Gynaecol* 80(2): 188-201.
- Schepsis AA, Wagner C, Leach RE. Surgical management of Achilles tendon overuse injuries. A long term followup study. *Am J Sports Med*. 1994;22:611-9. [PubMed]
- J. Maffulli N (2011) Terminology for Achilles tendon related disorders. *Knee Surg Sports Traumatol Arthrosc* 19(5):835-841.
- van Dijk CN, van Sterkenburg MN, Wiegierinck JI, Karlsson Haglund P. Beitrag zur Klinik der Achillessehne. *Z Orthop Chir*. 1928;49:49-58
- Angerman P. Chronic retrocalcaneal bursitis treated by resection of the calcaneus. *Foot Ankle* 1990;10:285-287.
- Morag G, Maman E, Arbel R. Endoscopic treatment of hind-foot pathology. *Arthroscopy* 2003;19:1-6.
- Sarraffian SK, Ibrahim IN, Breihan JH. Hind-foot peripheral nerve block for mid and forefoot surgery. *Foot Ankle* 1983;4:86-90.
- Sella EJ, Caminear DS, McLarney EA. Haglund's syndrome. *J Foot Ankle Surg* 1998;37:110-114
- Nesse E, Finsen V. Poor results after resection for Haglund's heel. Analysis of 35 heels in 23 patients after 3 years. *Acta Orthop Scand* 1994;65:107-109.
- Schneider W, Niehus W, Knahr K. Haglund's syndrome: disappointing results following surgery : a clinical and radiographic analysis. *Foot Ankle Int* 2000;21:26-30.
- Sammarco CJ, Taylor AL. Operative management of Haglund's deformity in the nonathlete : a retrospective study. *Foot Ankle Int* 1998;19:724-729.
- Miller AE, Vogel TA. Haglund's deformity and the keck and Kelly osteotomy : a retrospective analysis. *J Foot Surg* 1989;28:23-29.
- Jones DC, James SL. Partial calcaneal osteotomy for retrocalcaneal bursitis. *Am J Sports Med* 2000;12:71-72.
- Green AH, Hass MI, Tubridy SP et al. Calcaneal osteotomy for retrocalcaneal exostosis. *Clin Podiatr Med Surg* 1991;8:659-665