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# A New and Innovative Surgical Approach to Treating Haglund Deformity

## ABSTRACT

**Introduction:** Haglund's deformity is a frequent cause of posterior heel pain associated with retrocalcaneal bursitis and Achilles tendon irritation. Surgical management is indicated in patients who fail conservative treatment. This study presents a novel sigma incision approach designed to minimize soft tissue damage and preserve tendon integrity.

**Methods:** Six patients with Haglund's triad refractory to at least six months of conservative therapy underwent surgical treatment using a sigma-shaped incision. The procedure involved excision of the Haglund deformity and posterior calcaneal spur without detaching the Achilles tendon. Patients were followed for six months, and outcomes were assessed using Visual Analog Scale (VAS) and AOFAS Ankle-Hindfoot scores.

**Results:** The mean VAS score improved from 7.6 preoperatively to 3.8 at six months postoperatively. The mean AOFAS score increased from 39.1 to 67.5. No complications such as wound infection, Achilles tendon rupture, or painful scarring were observed. Conclusion: The sigma incision approach is a safe and effective surgical technique for Haglund's deformity, providing significant pain relief, improved functional outcomes, and reduced complication rates while preserving Achilles tendon strength.

**Key words:** Haglund's deformity, VAS pain score, psoriatic arthritis

## INTRODUCTION

Haglund's deformity, also referred to as Mulholland deformity, retrocalcaneal exostosis, or "pump bump," is characterized by a bony prominence at the posterosuperior aspect of the calcaneus. This prominence can irritate the retrocalcaneal bursa as well as the Achilles tendon insertion.

The condition was first described by Patrick Haglund in 1927.[1] It is a well-recognized cause of posterior heel pain and is clinically identified by a prominent bony projection associated with bursitis.[2] In most cases, the condition is idiopathic and often bilateral. However, several contributing factors have been identified, including advancing age, repetitive mechanical stress, obesity, and underlying systemic inflammatory disorders such as psoriatic arthritis, spondyloarthropathies, rheumatoid arthritis, and Reiter's disease.

Less commonly, other predisposing factors may include genetic susceptibility, lower limb malalignment, and the use of certain medications such as corticosteroids, fluoroquinolones, and protease inhibitors. Additionally, comorbid conditions like connective tissue disorders, vascular diseases, diabetes mellitus, hypertension, and hypercholesterolemia may also play a role.[16] The deformity is more frequently observed in physically active individuals, particularly runners and athletes, with a higher prevalence noted in females compared to males. It typically affects young to middle-aged individuals.

Inflammation of the retrocalcaneal bursa is primarily attributed to mechanical irritation or impingement, especially during ankle dorsiflexion.[3] The presence of a posterosuperior calcaneal spur may further contribute by compressing the Achilles tendon between the spur and the bony prominence.

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Clinically, patients present with pain at the posterior aspect of the heel, which is often more pronounced when initiating walking after periods of rest.

Initial management is usually conservative and includes rest, limb elevation, application of cold packs, footwear modification (such as the use of insoles), eccentric Achilles tendon exercises, ultrasound therapy, analgesics, and local corticosteroid injections.[5,6] While corticosteroid injections may provide symptomatic relief, they carry a risk of Achilles tendon rupture and should therefore be used with caution.[7]

Casting may be necessary for pain reduction in severe cases however it may be difficult to be effective alone in such cases surgery is a reasonable option for patients (10%) not responding to 3–6 months of nonoperative treatment.[8]

Several incisions have been advocated for insertional Achilles tendinopathy, including posterior central midline, medial and/or lateral, J-shaped, and transverse incisions.[4] Traditionally, surgery on the Achilles tendon is performed through longitudinal extensile incisions in about 10% of cases.[9,10,11]

Authors believe that in event of surgery excision of both the posterior calcaneal spur and Haglund's deformity through a single safe approach gives better pain relief. This approach has lesser soft tissue complications as compared with other approaches as the extent of flap elevation is minimal to accomplish the surgery.

## METHOD

All the procedures were performed under spinal anaesthesia with the patient in a prone position, the tourniquet is applied. It is often not inflated as the area is relatively avascular and hypotensive anaesthesia allows smooth conduct of the surgery with minimal blood ooze.

The knee is flexed to 30° and a bump of folded pillow is placed below the ankle, allowing free ankle movements.

Incision starts at the medial border of Achilles tendon. In the proximal aspect, the incision starts about 2 inches proximal to the superior border of the Calcaneum and then it is extended distally. It curves over laterally at the superior border of the calcaneus in a sigma shape. Incision curves over the Achilles tendon towards laterally. The Incision ends in the mid portion of the Achilles insertion over calcaneum. Sharp dissection is done using a 15 number knife.

The paratenon and the subacute and the skin is raised as a single flap. As we reach towards the distal end of the incision the sharp dissection is directed towards the anterior aspect of the Achilles tendon. The inflammatory tissue, bursa and fluid is found between Achilles tendon and Haglund deformity. This is removed with help of sharp dissection and bone nibbler.

The extent of Haglund deformity is identified and the bony projection is removed with the help of a 5 mm osteotome. Complete excision of Haglund deformity can be ensured using C arm if required. Osteotomy site is checked with gloved finger palpation to ensure that no bony spicules are left protruding and irritating Achilles tendon

Next the attention is drawn toward the distal part of the incision. A full thickness, skin, and paratenon flap is opened in the midline of the Achilles tendon. Posterior calcaneal spur is identified and removed with help of Lambotte type fine and thin osteotome. The osteotome can easily be wedged between tendon and bone. The spur is removed in full mediolateral extent. Often fine bony spicules are present inside the tendon. These can be identified by palpation. These are removed by longitudinally opening the tendon fibres and performing sharp dissection to remove bony concretion.

The advantage of this method is that the strength of the Tendon is adequately maintained for quick rehabilitation. The tendon does not need to be detached from its insertion. The authors believe that detachment of Achilles tendon and reattachment has long prolonged morbidity, slower recovery. It also causes loss of strength of the tendon. The skin flap necrosis is a major disadvantage in other incisions as compared with this method.

The full thickness skin flap is closed with help of 2.0 vicryl and skin stapler. If the surgery requires minimum tendon exploration the rehabilitation protocol includes partial weight bearing for four weeks followed by full weight bearing and crutch use for six weeks is advised. Ankle strengthening exercises are advised.

Final intraoperative confirmation was performed using image intensification to ensure complete removal of the Haglund's deformity, posterior insertional osteophytes, and any tendon calcifications. This was followed by application of a plaster cast with the foot maintained in a plantigrade position.

Postoperatively, plain radiographs were obtained for reassessment. The limb was immobilized in a short leg cast with the ankle positioned in approximately 15° of plantar flexion. At two weeks after surgery, sutures were removed and the cast was reapplied with the ankle in a neutral position. Range-of-motion exercises were initiated at the end of the first postoperative month. Patients were advised to remain non-weight-bearing for six weeks, followed by gradual initiation of partial weight-bearing between six and eight weeks. By two months postoperatively, progressive weight-bearing as tolerated was permitted. Return to high-impact activities or heavy lifting was deferred until six months after surgery.

## RESULT

6 patients with a diagnosis of Haglund's triad underwent surgical management using sigma incision approach. Of the 6 patients, 3 were females (50%) and 3 were males (50%), with a mean age of 49.1 (range 41 to 60) years. Of the 22 heels, 11 were right heels (50%) and 11 were left (50%). For all patients, various modalities of conservative management, which had been conducted for 6 months, had failed preoperatively. Conservative management consisted of one of the following modalities: nonsteroidal anti-inflammatory drugs (NSAIDS), removable ankle orthotics (RAO), heel cups (HC), and professional physiotherapy (PP).

The mean VAS pain score improved significantly from 7.6 preoperatively (PO) to 3.8 at 6 months postoperatively (6MFU). The average AOFAS Ankle-Hindfoot scale score had increased significantly from 39.1 preoperatively to 67.5 at 6 months postoperatively

No complications of Achilles tendon rupture, wound infection, or painful scars occurred.

The VAS pain score and AOFAS Ankle-Hindfoot scale score were prospectively collected preoperatively, 6 months postoperatively.

## DISCUSSION

Although different open approaches have been described for operative management of Haglund deformity, we present a new approach for the treatment of this condition.

There are some limitations to the lateral incision. First, this incision is not appropriate for patients who only have medial heel pain.[12] In other words, the degeneration only exists in the medial part of the Achilles. Second, when transposition of the flexor hallucis longus was needed, this incision could not expose the flexor hallucis longus clearly. Thirdly, aggressive detachment of the Achilles tendon could be a crucial factor related to poorer functional outcomes in the complete detachment approach, and there were also some cases where Achilles tendon ruptures occurred.[11]

While medial and lateral approaches result in limited exposure, excessive retraction, or ineffective debridement, this incision provides access to all pathological areas with a single incision and enables wound closure with minimal tension.[13] The loss of plantarflexion strength was minimised by preserving as much of the tendon insertion as possible as compared to the central tendon splitting approach, in which the skin and subcutaneous tissues are placed under substantial tension after closure, which could have negative effects on wound healing and might cause wound dehiscence.

Another advantage of this approach is the avoidance of sural nerve damage by lateral and Cincinnati (transverse circumferential incision) incision[15] and reduction of damage to the blood supply of the Achilles tendon,[14] and also no requirement of suture anchors.

## CONCLUSION

There are several approaches to Haglund deformity in this paper we demonstrate a unique approach that enables early weight-bearing and achieves a good outcome and pain relief.

## LIMITATIONS

The findings of the present study should be considered in the context of certain limitations. First, the duration of follow-up was relatively short, which may not fully capture the long-term outcomes or maximal benefits of the surgical intervention. Second, the study included a limited number of patients, and the sample size may have been insufficient to identify factors influencing surgical outcomes. Finally, as a retrospective analysis conducted at a single center, the study is subject to inherent selection and observational biases. Future prospective, multicenter studies with larger cohorts and extended follow-up are warranted to better assess surgical outcomes in Haglund's triad and to identify potential risk factors.

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