



## Original Research Article

## Reduction osteotomy for Haglund hump – surgical options and results

Dr. Mohamed Ashraf<sup>1</sup>, Vishnu S<sup>2\*</sup>, Gokul Dev<sup>3</sup>, Haseeb Mukhtar<sup>3</sup>, Arun Lal<sup>3</sup>, Sinan Muhammad<sup>3</sup>, Bidhu Balan<sup>3</sup>

<sup>1</sup>Indian Orthopaedic Association, India

<sup>2</sup>Dept. of Orthopaedic, Kerala University of Health Sciences (KUHS) Thrissur, Kerala, India

<sup>3</sup>Dept. of Orthopaedic, Travancore Medicity Medical College Hospital, Kollam, Kerala, India

## Abstract

**Background:** Calcaneal hump (Haglund hump/ winter heel) is a clinical condition affecting 25% of patients who present with posterior heel pain. This is one of the main reasons for chronic heel pain. Associated comorbidities are rheumatoid arthritis, gouty arthritis and obesity. Most of the patients may respond to conservative treatment in the form of medication, restricted activities, orthosis, physiotherapy and modification of aggravating factors. 20 to 40% patients may require surgical intervention.

**Materials and Methods:** 20 patients with resistant heel pain due to calcaneal hump were treated between year 2019 to 2023 using reduction osteotomy in our institution. 14 patients were female and 6 patients were males. Age group was between 48 and 62 with mean age of 55. 16 patients were having associated comorbidities. Follow up period was 12 months to 48 months.

**Results:** All patients were assessed with AOFAS score before and periodically after surgery. All parameters improved after surgery. Patients disability score improved. One patient had wound healing problem. One patient had persistence of symptoms.

**Conclusion:** Reduction osteotomy of calcaneal hump is a simple but very useful surgical option for persistent pain and disability due to calcaneal hump. This is the treatment of choice when other modalities fail in selected cases.

**Keywords:** Heel pain, Winter heel, Calcaneal hump, Humpectomy, Reduction osteotomy, Tendoachilles rupture, Calcaneal bursitis.

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## 1. Introduction

The Haglund deformity is a posterosuperior calcaneal prominence and represents a major cause of posterior heel pain.<sup>1,2</sup> It was first described by Patrick Haglund in 1928;<sup>3</sup> is a common clinical condition affecting 25% of patients who present with posterior heel pain. Symptom complex with Haglund deformity is called as Haglund disease. 60-70% cases respond to conservative treatment like analgesics, life style modifications, physiotherapy and shoe alterations. But 30% of cases are resistant to non-surgical measures. Surgical options include open or endoscopic approach. Basic steps are same in both like humpectomy, bursectomy, debridement of Tendoachilles and reinforcement of diseased tendon if needed.

Both approaches are equally effective on long-term follow up. Endoscopic technique has got less hospital stay and early return to work, but needs expertise and equipments.

Roentgenographic evaluation of the ankle can demonstrate the posterosuperior calcaneal prominence and radiographic measurements such as Fowler's angle and parallel pitch lines are used for assessing the degree of prominence.<sup>4</sup> Tendoachilles shows calcification in most of the cases.

The open surgery can be done via medial, lateral and central tendon splitting approach. Reported complications of open surgical treatment include surgical site infections, altered sensation around the wound and heel, hypertrophic scars, recurrence of pain due to inadequate resection, stiffness, and Achilles tendon rupture.

\*Corresponding author: Vishnu S  
Email: [drvishnusc@gmail.com](mailto:drvishnusc@gmail.com)

## Haglund hump and stretched Tendoachilles (Diagrammatic representation)

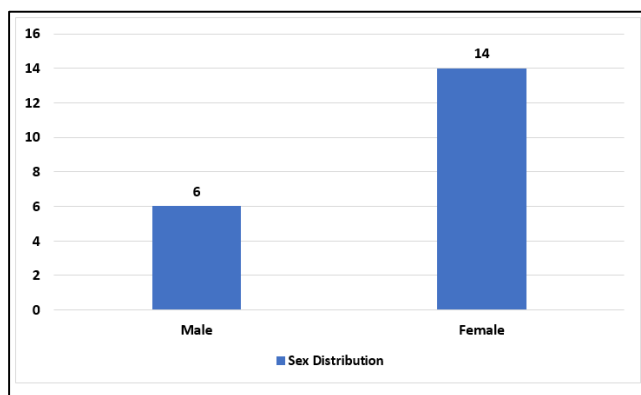
Normal MRI morphology.

Degenerated tendon with partial tear.

The aim of this study is to assess the surgical options for Haglund deformity and it's results.

## 2. Materials and Methods

The study was done in Travancore medical college, Kollam, Kerala, India between a period of 2019 and 2023 for patients with Heel pain due to Haglund deformity. Total number of patients included in the study were 20 of which 6 were males and 14 were females. Age group was between 48 and 62 with mean age of 55. Sixteen patients were having associated comorbidities. Follow up period was 12 months to 48 months.



**Figure 1:** Sex distribution



**Figure 2:** Pre-operative x-ray

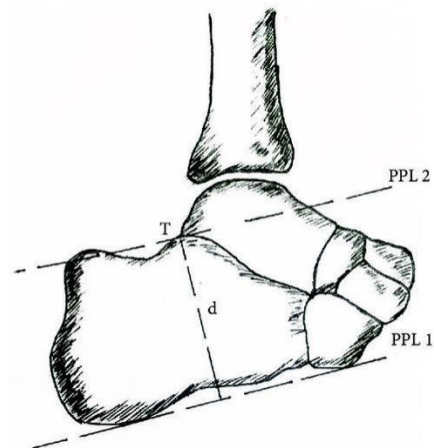
### 1.1. Exclusion criteria

1. Old United fracture of calcaneum
2. Tendoachilles rupture
3. Infected retro calcaneal bursitis
4. Neuropathic foot

Physical examination reveals a palpable hump in the retro calcaneal region.

All the patients in the study group were evaluated preoperatively with x-ray lateral view of the ankle, and

radiographic assessments such as Fowler's angle and parallel pitch lines are used for measuring the degree of prominence.<sup>5</sup>



**Figure 3:** Radiological evaluation

### 1.2. Surgical technique

1. Anesthesia: Local anesthesia or regional anesthesia
2. Position: Supine position
3. Posteromedial approach: Medicity technique

In our technique we prefer supine with figure of four position. Tendon reinforcement can be done with SS wire, ethibond or fibre wire. SS wire carries the risk of surgical site infection, irritation and reoperation. If tendon is preserved, early mobilisation can be started. If tendon debridement and reattachment is done; 4-6 weeks of immobilisation mandatory.

All the subjects of the study has been evaluated clinically at 6 weeks, 3, 6 months and annually thereafter. We used AOFAS [American orthopedic foot and ankle society] ankle-hind foot score to evaluate the subjective satisfaction at the most recent follow-up. Results were rated as excellent (100-90 points), good (89-80 points), fair (79-70), or poor (<70).



**Figure 4:** Per op photograph

### 3.1. Post op protocol

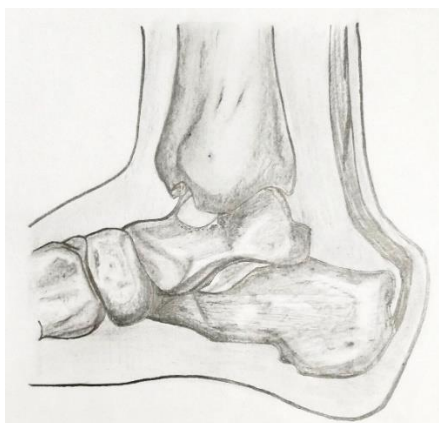
A below knee anterior POP slab is applied. After 2 weeks sutures removed. Following sutures removal slab removed

and ankle mobilization started along with toe touch, gradual weight bearing and Full weight bearing as tolerated.

### 3. Results

All the patients were followed-up for 24 months after surgery. At final follow-up the average range of ankle plantar flexion was  $132.5^\circ$  (range,  $125^\circ$ - $140^\circ$ ) on the repaired side and  $142.5^\circ$  (range,  $130^\circ$ - $155^\circ$ ) on the non-injured side. The average range of ankle dorsiflexion was  $19^\circ$  (range,  $17^\circ$ - $21^\circ$ ) on the operated side and  $20.5^\circ$  (range,  $18^\circ$ - $23^\circ$ ) on the non-injured side. The mean calf diameter was 40 cm (range, 36-44 cm) on the operated side and 42 cm (range, 39-45 cm) on the non-injured side. The interval between surgery and return to regular work was 5 weeks (range 3 to 7 weeks). The mean AOFAS score post procedure was 90 at the most recent follow up and 85% of patients results were found to have excellent and 15% were good.

**Complications:** One patient had superficial wound infection and controlled with antibiotics and wound care. One patient had persistence of symptoms and needs to have periodic medication for symptom relief.



**Figure 5:** Pathoanatomy of Haglund deformity



**Figure 6:** MRI of degenerative tendoachilles rupture



**Figure 7:** Pre-op x-ray



**Figure 8:** Post-op x-ray

### 4. Discussion

Haglund's deformity is the most important cause of posterior heel pain. Classically, posterosuperior calcaneal prominence associated with retro calcaneal pain and tenderness is called Haglund's disease.<sup>8</sup> An objective method for evaluating prominence of the bursal projection is measurement using the parallel pitch lines and fowler's angle.<sup>9</sup> Ultrasonography evaluation will show evidence of bursitis, tendoachilles calcification and degeneration. But these conditions has got poor outcome.<sup>10</sup>

Most of the patients may respond to conservative treatment;<sup>11</sup> but 20 to 40% patients may requires surgical intervention. The surgical technique include excision of inflamed retrocalcaneal bursa, resection of Haglund's deformity, and debridement of unhealthy Achilles tendon.<sup>4</sup> There is no ideal approach to this surgical procedures. In our study we reviewed 20 patients who have underwent Haglund deformity excision via medial approach.

Haglund disease is a disabling clinical condition. That may affect the recreational, professional and sometimes activities of daily living may be affected. A decision on early

surgical intervention is essential to lessen then harmful effects of long term medication and loss of working days. 3-6 months of conserved treatment is enough to take decision.<sup>2</sup> Surgical options are either open or endoscopic decompression, with equal outcome on long term results. Basic surgical steps must include adequate removal of the hump, complete resection of the retrocalcaneal bursa, debridement of the degenerated Tendoachilles with or without detachment.

Majority surgeons prefer prone position. Other commonly preferred approaches are medial,<sup>11</sup> lateral<sup>12</sup> and midline splitting.

#### 4.1. Kollam medicity technique

Here we are describing a modified technique. In this modification patient is positioned in supine with affected limb in figure of four position. Our approach is posteromedial. In this approach there is less chance of sural nerve injury. Haglund hump and retrocalcaneal bursa are fully visualised. If needed neurovascular bundle exposed and protected. In most of the cases Tendoachilles never detached. If degenerated, it may be debrided and reinforced with Number 2 ethibond or similar sized fibre wire. We occasionally use 23 gauge steel wire. Surgical options of Haglund deformity is very effective and simple. If meticulously planned and executed functional recovery is equal after open and endoscopic technique. We are describing our own experience with modification on the technique with better outcome. Our sample size is small and needs further propagation and evaluation.

Procedure with detachment and reattachment carries more implant related complications.<sup>1</sup> The types of osteotomy described are wedge and reduction osteotomy.<sup>12</sup> The dorsal closed wedge osteotomy has got poor results.<sup>13</sup>

The described complications are surgical site infection, sensory abnormality, Keloid formation, delayed wound healing, inadequate resection, stiff joints, Tendoachilles rupture and sural nerve injury.<sup>4,1</sup>

The long term results of open and endoscopic technique are similar;<sup>14</sup> but some studies claim open technique is better.<sup>15</sup>

## 5. Conclusion

Haglund deformity can lead to disabling heel pain in extreme complications like closed Tendoachilles rupture. Reduction osteotomy of calcaneum is the only surgical solution for symptoms associated with Haglund hump and future prevention of Tendoachilles rupture. Reduction osteotomy of calcaneal hump is a simple but very useful surgical option for persistent pain and disability due to calcaneal hump. This is the treatment of choice when other modalities fail in selected cases. It is a simple surgical procedure which doesn't need

any implant. The patients could return to normal activity earlier and has less chance of recurrence. Most importantly the procedure has shallow learning curve which helps in proper surgical technique.

## 6. Source of Funding

None.

## 7. Conflict of Interest

None.

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