

Evaluation of Results of Minimally Invasive Endoscopic Management of Haglund Syndrome

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ABSTRACT

BACKGROUND

Haglund syndrome is defined as the complex of symptoms involving the superolateral calcaneal prominence, retrocalcaneal bursitis and superficial adventitious Achilles tendon bursitis. The purpose of our study is to evaluate endoscopic treatment of Haglund's syndrome in which all patients showed a Haglund projection on radiography and none had a cavovarus deformity.

METHODS

Our study included 24 patients (30 heels) with a mean age of 32 yrs. (range 26-44 yrs.). They presented with posterior ankle impingement syndrome with Haglund's deformity on radiography and were resistant to conservative therapy for more than 6 months. They underwent two-portal endoscopic surgery in SCBMC & H between July 2016 and Dec. 2019. The inflamed bursa and posterosuperior surface of the calcaneus were removed with a shaver and bone resection performed until there was no friction on the Achilles tendon with the ankle in dorsiflexion. All patients were evaluated pre-operatively and postoperatively with parallel pitch lines, the American Orthopaedic Foot and Ankle Society (AOFAS) score, the visual analogue scale (VAS) for pain and the Ogilvie Harris score. The surgical time, time to return to day to day activity, patient satisfaction and any complications related to the surgery were assessed. All patients were discharged on the 2nd day and full weight-bearing was allowed from second postoperative week.

RESULTS

The mean follow-up was 24 months (range 6–41 months). In 27 heels, postoperatively we achieved negative parallel pitch lines on lateral radiographs. The average AOFAS score improved from 59.3 ± 9.9 points pre-operatively to 94.8 ± 9.1 points at final evaluation ($p < 0.01$). There were sixteen excellent results, ten good results, two fair results and two poor results. For the Ogilvie Harris score, there were seventeen excellent, ten good, one fair, and two poor results. The VAS for pain decreased from 6.8 ± 1.4 (range 5 -10) preoperatively to 1.8 ± 0.8 (range 0-4) ($p < 0.01$) at final evaluation. There was no obvious intra or post-operative complications. All patients were satisfied with the results of the operation.

CONCLUSIONS

Endoscopic calcaneoplasty is a safe and effective minimally invasive treatment option for Haglund disease after failure of conservative treatment for 6 months.

KEYWORDS

Haglund Disease, Endoscopic Calcaneoplasty

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BACKGROUND

Pain in the posterosuperior portion of the calcaneus can be caused by a retrocalcaneal bursitis, enlargement of the superior bursal prominence of the calcaneus (Haglund's deformity), Achilles tendinitis or inflammation of an adventitious bursa between the Achilles tendon and the skin.^{1,2,3,4,5,6,7,8,9} In 1928 the Swedish orthopaedist Patrick Haglund described a painful hindfoot and prominence in the area of the dorsal Haglund exostosis which was caused in his view by relatively rigid dorsal shoe mounts. Since then the painful bony prominence of the dorsal calcaneus has been described as Haglund deformity.¹⁰ Haglund syndrome is defined as the complex of symptoms involving the superolateral calcaneal prominence, retrocalcaneal bursitis and superficial adventitious Achilles tendon bursitis.^{4,7}

A variety of procedures for treatment of Haglund's syndrome including nonoperative and operative methods are in use. The conservative therapy of Haglund syndrome includes the administration of NSAIDs, local corticosteroid injections, ultrasound treatments and appropriate shoe straightening.⁷ Conservative treatment has been found to be successful in approximately 85 to 95% of patients.^{11,12} When there is failure of conservative treatment for 6 months operative therapy is indicated.¹³ Operative treatment involves removal of the posterosuperior prominence of the calcaneus and the inflamed bursa.¹⁴ Many authors have reported good postoperative improvements via open surgical corrections.^{14,15,16} However open surgical treatment is associated with different complications including skin necrosis, Achilles tendon avulsion, altered sensation and stiffness.^{17,18}

An alternative to open surgery is minimally invasive endoscopic procedure. The purpose of the study was to present our technique and our results with endoscopic calcaneoplasty where both the retrocalcaneal bursitis and so called "pumpbump" described in a similar technique by van Dijk et al¹⁹ was addressed.

METHODS

After approved by the Medical Ethics Committee of SCBMC & H, Cuttack for this study, informed consent was obtained from all the patients who presented to SCBMC & H with persistent posterior ankle pain due to Haglund deformity after failure of conservative treatment of 6 months. All patients provided written informed consent prior to participation.

This prospective study included 30 heels of 24 patients who underwent endoscopic calcaneoplasty after failure of a 6 months conservative treatment trial for Haglund deformity from July 2016 and Dec. 2019 in SCBMC&H. The age of the patients were between 26-44 years (mean 32 years). There were 14 men and 10 women. The radiological examination prior to surgery documented in all cases a posterior superior calcaneal exostosis that showed friction to Achilles tendon on endoscopy. All patients included in the study had no

clinical varus of the hind foot nor cavus deformities. The average follow up was 30 months (2.5 years). None of the patients were lost to follow up.

Inclusion Criteria

We included all patients with PAIS due to Haglund deformity who had -

1. Unsatisfactory improvement after conservative treatment for ≥ 6 months.
2. Absence of any previous surgical procedure on the same ankle.
3. Patients willing for surgery.

Surgical Technique

We performed the operation with the patient in prone position. The patient is usually withdrawn downwards such that the foot and ankle are hanging freely over the edge of the operating table so that plantar and dorsiflexion of ankle can be done freely. The operation is done under regional anaesthesia and a thigh tourniquet is used. Dorsiflexion of foot can be manipulated by placement of the surgeons body against the foot thus allowing both hands to freely manipulate the arthroscope and the surgical instruments. The opposite leg being strapped to thigh in flexion position of knee.

C arm was kept ready and in position from the start of the procedure. A needle is placed approximately 0.5 cm below the superior aspect of the calcaneus just lateral to the lateral margin of the Achilles tendon and confirms the lateral portal. A small vertical incision is then made through the skin. Separation of the subcutaneous tissue is made down to retrocalcaneal space. This is repeated by a blunt trocar. The 4 mm arthroscope is then introduced through this space. Under direct vision a needle is next introduced just medial to the medial border of Achilles tendon at the same level as the lateral portal. This confirms the medial portal. The inflamed retrocalcaneal bursa is first visualised and is removed. It is removed by arthroscopic shaver. Then the FHL tendon is visualised on posteromedial aspect of ankle joint. The foot is then taken through a range of motion to visualize the exact site of impingement, usually due to a posterosuperior osteophyte. The posterosuperior bone rim of the calcaneus is removed with the help of a 4.5 mm arthroscopic burr. Care should be taken not to go far distally to the insertion of Achilles tendon. Throughout the procedure the Achilles tendon is protected by keeping the closed end of the resector or the burr against the tendon. The resector is then reintroduced to clean the soft tissue debris and to smoothen off the rough edges. Finally lateral radiography under C arm confirms the amount of bone resected. Lastly skin is closed and a compression dressing is placed.

Postoperative Protocol

Elevation of foot done immediately. The patients are encouraged to perform range of motion exercises from 1st postop day. Partial weight bearing was started from second day. Full weight bearing was allowed at the second

postoperative week. Regular shoes were allowed after 3 weeks postoperatively. Returning to sporting activities was not allowed till 6 weeks.

Statistical Analysis

All quantitative variables are presented as the mean \pm standard deviation. Comparisons between paired data such as the preoperative and postoperative VAS score, AOFAS scale score and the Ogilvie Harris score were performed using the Student t test. The significance level was defined as $p < 0.01$. Data analysis were performed using SPSS software, version 17.0 (SPSS, Chicago, IL) & Microsoft excel. On the basis of the postoperative AOFAS score - excellent outcome (90-100), good (80-89), fair (70-79), poor (<70).

RESULTS



Image 1

The mean age of the patients at final follow-up visit was 32 ± 8 years (range 26-44 yrs). The mean duration of surgery was 40 ± 3.8 minutes (range 30 -45). None of the patients was converted to open surgery. Average postoperative follow-up duration was 24 ± 8.6 months (range 6-41 months). Average AOFAS ankle hind foot score increased from 59.3 ± 9.9 (range 52- 63) preoperatively to 94.8 ± 9.1 (range 90-100) post-operatively ($p < 0.005$) at final follow-up. According to AOFAS, we had sixteen excellent results, ten good results, two fair results and two poor results. VAS for pain decreased from 6.8 ± 1.4 (range 5-10) preoperatively to 1.8 ± 0.8 (range 0-4) post operatively ($p < 0.01$). For the Ogilvie Harris score, there were seventeen excellent, ten good, one fair, and two poor results. Postoperative lateral radiographs in 27 heels showed achievement of adequate bony removal and negative parallel pitch lines. Mean time to resumption of professional activities was 6 weeks (range 4 - 8 weeks). On physical examination no patients showed any signs of local tenderness & the forced dorsiflexion test findings were negative. No

intraoperative & postoperative complications were noted. Overall patient satisfaction was high.

DISCUSSION

Initial management of heel pain in patients with diagnosed Haglund deformity includes NSAID, padding, avoidance of tight shoes, stretching and strengthening of the gastrocnemius-soleus complex, activity modification.¹⁹ A single infiltration in the retrocalcaneal bursa with corticosteroids is another modality of treatment after the above mentioned treatments have failed. But repeated infiltration has a potential risk for rupture of the Achilles tendon.¹⁷ Literature shows a mixed results on success rate of conservative treatment. According to the study of Myerson and Clement 85-95% of patients improved with conservative treatment.^{11,12} On the other hand Sammarco and Taylor reported a failure rate of 65% with conservative treatment for an average of 62 weeks.²⁰

The operative treatment of posterior ankle impingement syndrome due to Haglund deformity after failure of conservative measures aims at prevention of impingement of the retrocalcaneal bursa between the Achilles tendon and the os calcis. This can be accomplished by removal of the inflamed retrocalcaneal bursa followed by resection of the superoposterior calcaneal prominence. Superoposterior calcaneal resection can be performed by open surgical procedure through postero- lateral incision, a posteromedial incision, or both. Several complications, such as weakening of the bone after removal of a large part of the posterosuperior calcaneus, recurrent pain, unpleasant scars or tenderness around the scars, Achilles tendon avulsion, stiffness of the Achilles tendon, and altered sensation around the heel have also been reported following open procedures.^{18,20,21,22,23}

Angermann²² operated on 40 heels in 37 patients with haglund deformity using a posterolateral incision and allowed immediate weight bearing. Complications included one case of superficial heel infection, one case of hematoma, and two cases of delayed skin healing. At an average follow-up of 6 years, 50% of the patients were cured, 20% were improved, 20% were unchanged, and 10% were worse. Huber and Waldis¹³ found a considerable amount of residual complaints in 32 patients who were examined clinically and radiologically at a mean follow- up of 18.6 years after being treated for Haglund's exostoses by resection of the posterosuperior calcaneal prominence. Fourteen of the 32 patients had soft tissue problems, including excessive scar formation and persistent swelling. Not enough bone was removed in 8 patients and 2 patients had new bone formation; both caused persistent painful swelling. In 8 patients a disturbance in Achilles tendon function was noted. Thus the open operative treatment of symptomatic Haglund deformity requires good exposure to remove an adequate amount of bone. Conversely, a large exposure is accompanied by a significant percentage of wound and soft tissue problems.

Endoscopic calcaneo-plasty offers a good alternative to open resection. Van Dijk et al. described the use of retrocalcaneal endoscopy for treatment of Haglund disease and retrocalcaneal bursitis in 2000.¹⁴ Jerosch and Nasef²⁴ reported 7 excellent and 3 good Ogilvie-Harris scores after a mean follow-up period of 5.2 months in their study on 10 patients undergoing endoscopic calcaneoplasty. There were no intra- or postoperative complications. Leitze et al.²⁵ compared the results of 33 endoscopic decompressions of the retrocalcaneal space with 17 open surgeries. Both groups had improvements in AOFAS scores although the difference was not significant ($p=0.115$). Complication rates were slightly different (infection: 3% and 12%; altered sensation: 10% and 18%; scar tenderness: 7% and 18%). In our study of 24 patients (30 heels) of Haglund syndrome undergoing endoscopic treatment, we got 16 excellent, 10 good, 2 fair & 2 poor results according to AOFAS scoring at a mean follow-up of 24 months. There was no intraoperative & postoperative complications. Overall patient satisfaction was high.

Arthroscopic surgery allows for excellent medial and lateral visualization. Thus, the Achilles tendon and its insertion and the calcaneus can be inspected and treated. This minimizes the chance of removing and disturbing the Achilles tendon attachment. Other advantages of the endoscopic technique are that complications, such as wound dehiscence, painful or unsightly scars, and nerve entrapment within the scar, can be avoided.

CONCLUSIONS

Whether the surgery is performed by endoscopic or open technique, enough bone has to be removed to prevent impingement of the retrocalcaneal bursa between the calcaneus and Achilles tendon. Endoscopic calcaneoplasty has several advantages, including low morbidity, functional after treatment, outpatient treatment, excellent scar healing, a short recovery time, and quick sports resumption, in comparison with the open technique.

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