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More extensile osteotomy in the treatment of posterior calcaneal osteophyte (Haglund's disease)

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Abstract

The aim of this study is to present a more extensile osteotomy performed for the treatment of Haglund's disease and the results of 2-year follow-up of these patients.Fifteen feet of 15 patients who underwent open surgery by the same surgeon between 2011 and 2015 were included in the study. In this technique, the Achilles tendon is split into two in the middle and tenotomized at its insertion. Retrocalcaneal bursa and exocytosis is completely excised and tenodesis of the Achilles tendon to its old insertion is performed with the help of two 5 mm suture anchors. All patients were discharged on the postoperative first day. Postoperatively, a short leg plaster cast was applied for six weeks with the ankle in slightly plantar flexed position. For the next six weeks, patients were followed up with an ankle foot orthosis with the ankle in neutral position. At the end of the third month, orthosis treatment was discontinued in all patients. The patients were evaluated with the visual analog scale (VAS) and American Orthopedic Foot and Ankle Society (AOFAS) ankle and hindfoot scores (FAOS) preoperatively and at 3 months postoperatively. The mean follow-up period was 27.4 months. A statistically significant difference was found between preoperative and postoperative for both VAS and FAOS scores ($p < 0.001$). No complications were observed during or after surgery. All of the patients were satisfied with the results of the surgery. The improvement in all patients was statistically significant. According to the preoperative and postoperative assessment scores, successful results were obtained in all patients with this technique.

Keywords: Haglund's disease, Achilles tendon, Retrocalcaneal exocytosis, Retrocalcaneal bursa

Introduction

Heel pain is one of the common foot and ankle complaints. Causes of heel pain consists plantar fasciitis, paratendinitis, calcaneal apophysitis, bursitis, insertional Achilles tendinitis, Achilles tendinitis due to seronegative spondyloarthropathies, calcaneal periostitis, heel fat pad atrophy, entrapment neuropathies, heel stress fractures and Haglund's disease (1-8).

Haglund's disease, one of the most common causes of posterior heel pain, was first described in 1928 by the Swedish orthopedic surgeon Patrick Haglund (1870-1937) (9). Haglund's disease consists of superolateral calcaneal exocytosis, retrocalcaneal or superocalcaneal bursitis, and Achilles tendonitis; and it is also called Haglund's deformity or "pump bump" (10-12). Symptoms develop due to pressure caused by calcaneal protrusion.

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Clinical findings include swelling in the cranial and lateral parts of the calcaneus, occasional skin irritation, pressure-related pain in the Achilles tendon insertion, and hindfoot pain in active and passive dorsal and plantar flexion of the foot. Pain can also be triggered by squeezing the thickened bursa just anterior to the Achilles tendon in the mediolateral direction. Patients typically experience pain when they start to walk after rest. Haglund's disease is often encountered bilaterally in females at the end of their 2nd and 3rd decades. The diagnosis is based on subjective complaints, physical examination findings and radiological examination results (1-5,11-13).

Conservative approach is recommended in the first step of the treatment. It includes activity modification, avoidance of strict shoes, and use of heel pad orthoses, physical therapy modalities, NSAIDs, and local steroid injections into the retrocalcaneal region. Conservative treatment is successful in 85-95% of the patients. However, long-term conservative treatment is not effective in all cases and has high recurrence rates. Therefore, surgical treatment is recommended when the conservative methods fail (11-13).

Two methods have been defined as open and endoscopic for the

surgical treatment. Open surgery is described as the resection of the posterosuperior part of the calcaneus and the inflamed retrocalcaneal bursa using a posterolateral or posteromedial approach. Also, some authors advocate wedge osteotomy for the calcaneus (14-17). In 2000, van Dijk et al. described endoscopic resection of the calcaneal exocytosis (18) and in 2001 they named this procedure "endoscopic calcaneoplasty" (19). The most important complication of the endoscopic approach is residual calcaneal protrusion due to insufficient resection and ongoing pain. As a result, revision surgeries are indicated (17).

The aim of this study is to present a more extensile osteotomy performed for the treatment of Haglund's disease and the results of 2-year follow-up of these patients.

Material and Methods

Fifteen feet of 15 patients (11 male, 4 female; mean age: 48 (24-68)) who underwent open surgery by the same surgeon between 2011 and 2015 were included in the study. All of the patients had hindfoot pain, difficulty of wearing shoes, soft tissue swelling and cosmetic issues at the insertion of the Achilles tendon, tenderness with palpation on the posterosuperior of the calcaneus, and the insertion zone was painful with tension. The diagnosis was confirmed by the presence of retrocalcaneal exocytosis on conventional radiographs (foot AP/L and weight bearing ankle lateral radiograph) (Figure 1). Conservative measures were applied for six months in all patients which includes heel riser soles, shoe and activity modification, local ice application, stretching exercises and NSAIDs. None of our patients received local steroid injections due to the high risk of tendon rupture. None of the patients had any rheumatologic disease. Failure of conservative modalities and resistant pain was accepted as surgical indication.

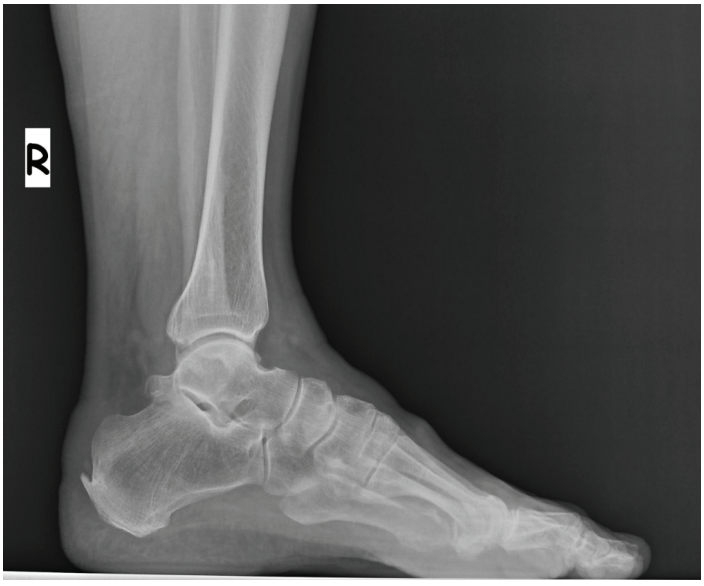

Figure 1. Preoperative standing lateral radiograph of a patient

For the surgical technique, the patients were placed in prone position with their feet and ankle positioned slightly over the distal edge of the operating table with a small cushion supporting the distal tibia, allowing the free movement of the ankle following 1gr IV cephazoline prophylaxis and spinal anesthesia. A thigh tourniquet is applied and is inflated to a pressure of 300 mm Hg after exsanguination of the lower extremity. Typically, a 5 to 7 cm midline longitudinal skin incision of was utilized from the insertion of the Achilles tendon towards the proximal. The Achilles tendon was split in the middle and tenotomy was performed at the tendon insertion. Retrocalcaneal bursa and exocytosis were completely excised. Tenodesis was performed to the original insertion of Achilles tendon with the help of two 5 mm suture anchors. The presence of residual calcaneal exocytosis and the placement of the anchors were confirmed by intraoperative fluoroscopy (Figure 2). No drain was used. Split incision of tenotomy was repaired with 3/0 absorbable sutures. Tourniquet was released and after thorough irrigation and hemostasis and subcutaneous tissue and skin were closed using 4/0 rapid vicryl in subcutaneous fashion. The mean surgical time was 30 ± 10 (20-40) minutes. After skin cleansing and wound dressings, a short leg plaster cast was applied with the ankle in slightly plantar flexed position. All patients were discharged on the first postoperative day. Short leg plaster cast held for six weeks. For the next six weeks, patients were followed up with an ankle foot orthosis which kept the ankle in neutral position. At the end of the third month, orthosis treatment was discontinued in all patients.

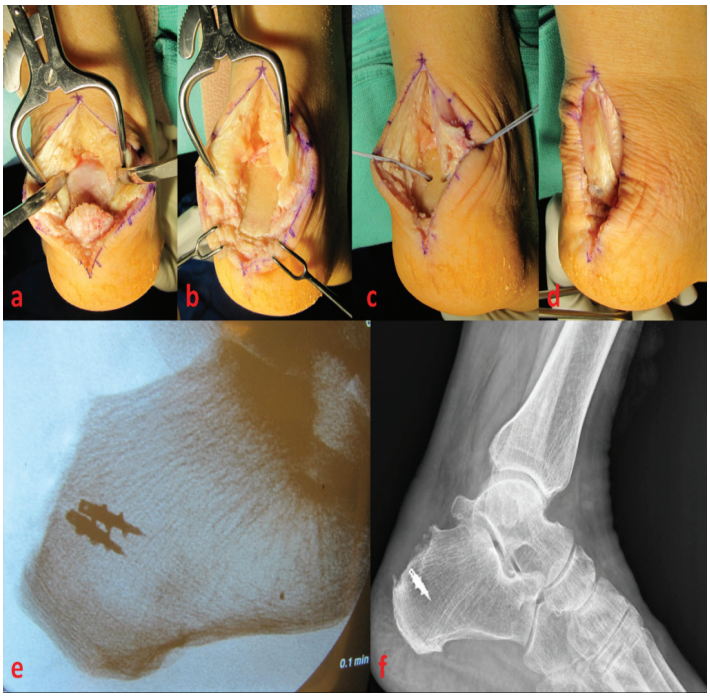

Figure 2. Operative steps of the same patient. a) The Achilles tendon is split in the middle and tenotomy is performed at the insertion, b) Retrocalcaneal bursa and exocytosis is completely excised, c) Application of two 5 mm suture anchors to the original insertion of Achilles tendon, d) Repair of the split incision of tenotomy after tenodesis, e) Intraoperative fluoroscopy image showing the correct placement of suture anchors and no residual calcaneal exocytosis, f) Postoperative 3rd month standing lateral radiograph of the patient

The patients were evaluated with the visual analog scale (VAS) score and American Orthopedic Foot and Ankle Society (AOFAS) ankle and hindfoot score (FAOS) which evaluates pain, symptoms, activities of daily living, sport and recreation function and quality of life based on 100 points (11, 20); preoperatively and at 3 months postoperatively. Statistical analysis was performed with SPSS using Wilcoxon signed rank test. P values less than 0.001 ($p < 0.001$) were considered statistically significant.

Table 1. Comparison of preoperative and postoperative outcome parameters.

	Preoperative	Postoperative 3rd month	Improvement	p*
VAS score	69.7 ± 16.3 (50-90)	12.3 ± 11.8 (0-30)	84.1% ± 19.6	<0.001
FAOS-Pain	46.6 ± 16.5 (25-78)	86.7 ± 11 (69-100)	104.8% ± 60.8	
FAOS-Symptoms	57.2 ± 19 (36-93)	86.6 ± 13.2 (71-100)	61.7% ± 34.6	
FAOS-Activities of daily living	59.9 ± 23.9 (28-96)	87.6 ± 13.1 (66-100)	%70 ± 71.3	
FAOS-Sport and recreation function	30.8 ± 19.1 (10-65)	75.1 ± 24.7 (40-100)	%225.7 ± 173	
FAOS-Quality of life	36.9 ± 21.8 (6-69)	77 ± 23.6 (38-100)	%275.1 ± 413.7	

*Wilcoxon signed rank test

Results

The mean follow-up was 27.4 (21-42) months. The mean preoperative VAS score of the patients was 69.7±16.3 (50-90), and 12.3±11.8 (0-30) 3 months postoperatively. The mean preoperative FAOS scores were 46.6±16.5 (25-78) for pain, 57.2±19 (36-93) for symptoms, 59.9±23.9 (28-96) for activities of daily living, 30.8±19.1 (10-65) for sport and recreation function and 36.9±21.8 (6-69) for quality of life. The mean postoperative 3rd month FAOS scores were 86.7±11 (69-100) for pain, 86.6±13.2 (71-100) for symptoms, 87.6±13.1 (66-100) for activities of daily living, 75.1±24.7 (40-100) for sport and recreation function and 77±23.6 (38-100) for quality of life (Table 1).

A statistically significant difference was found between the preoperative and postoperative evaluations for all parameters ($p < 0.001$). 84.1%±19.6 reduction in VAS scores, 104.8%±60.8 increase in FAOS pain scores, 61.7%±34.6 increase in FAOS symptoms scores, %70±71.3 increase FAOS activities of daily living scores, %225.7±173 increase in FAOS sport and recreation function scores and %275.1±413.7 increase in FAOS quality of life scores were found (Table 1). The improvement of scores for all of the patients was statistically significant. All of the patients were satisfied with the results of the surgery. No complications were observed during or after surgery. According to the preoperative and postoperative scores of the patients, it was found that the pain decreased and the patient satisfaction increased significantly with the applied surgery.

Discussion

Conservative approaches are recommended in the first step of the treatment of Haglund's disease. It includes activity modification, avoidance of strict shoes, and use of heel pad orthoses, physical therapy modalities, NSAIDs, and local steroid injections into the retrocalcaneal region. It should be noted that repeated local steroid injections may cause Achilles tendon rupture (21-23). Therefore, steroid injections were not preferred in any of our patients. Most of the patients with posterior heel pain can be treated effectively with conservative treatment methods. Myerson reported that conservative treatment was successful in 85 to 95% of patients (13). According to the results of the study conducted by Leitze et al., conservative treatment failed in 10% of the patients and their complaints continued. They stated that they chose surgical treatment methods in these patients (15). Sammarco and Taylor reported 65% failure rate with the conservative treatment methods (16).

Long-term conservative treatment is not effective in all cases and has high recurrence rates. Therefore, surgical treatment is recommended when conservative modalities fail (11-13,16). Two methods have been defined as open and endoscopic for the surgical treatment. Previously defined open techniques include the resection of the posterosuperior part of the calcaneus and the inflamed retrocalcaneal bursa using a posterolateral or posteromedial approach. Also, some authors advocate wedge osteotomy for the calcaneus

The results of open surgery with calcaneal osteotomy and retrocalcaneal bursa excision are common in the literature and success rates vary between 50% and 100% (14-17). Complications encountered after open surgical approaches in the literature include bone weakening due to resection of a large bone fragment from the posterosuperior calcaneus, continuation of posterior heel pain, dysesthesia around the heel, tenderness around the Achilles tendon and tendon rupture, scarring and infection (16,21-25). No major complications including infection, tendon rupture, dysesthesia or chronic pain were found in our study.

In his study, Angermann reported open posterosuperior calcaneus resection of 40 heels of 40 patients using a posterolateral incision. He reported 50% success rate after 6 years of follow-up. Delayed skin healing in two patients, superficial heel infection and hematoma in one patient was observed (26).

In 2000, van Dijk et al. described the endoscopic resection of the calcaneal exocytosis (18) and in 2001 they named this procedure "endoscopic calcaneoplasty" (19). The most important complication of the endoscopic approach is residual calcaneal protrusion due to insufficient resection and ongoing pain. As a result, revision surgeries are indicated (17-19).

In their study, Leitze et al. compared 33 endoscopic and 17 open surgeries and reported that all patients had improved FAOS scores (endoscopic group: 61.8-87.5 points, $p < 0.001$; open surgery group: 58.1-79.3 points, $p = 0.006$). They also reported that the difference between the two groups was not statistically significant ($p = 0.115$). They found slight differences in the complication rates between the two groups (infection: 3% to 12%; dysesthesia around the heel: 10% to 18%, skin sensitivity: 7% to 18%). They also

had to switch to open surgery due to insufficient resection in one patient in the endoscopic group (15).

In their study, Scholten and van Dijk performed 39 endoscopic resection and reported that two patients failed treatment after 4.5 years of follow-up. They also stated that they did not counter any complications except dysesthesia around the heel (25).

Another important problem of the endoscopic surgery is the prolonged operation time due to steep learning curve. Leitze stated that this period may decrease with experience (15). Another important problem is the risk of damaging the Achilles tendon due to inexperience in arthroscopic anatomy.

Our results are similar to the both open and endoscopic approach results in the current literature. We found statistically significant difference between preoperative and postoperative VAS and FAOS scores ($p<0.001$ for both scores). 61,7% to 275,1% improvement was calculated for the parameters. The improvement in all patients was statistically significant.

As a result; according to the preoperative and postoperative scores in our study, successful results were obtained in all patients with this technique.

Competing interests
The authors declare that they have no competing interests.

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Ethical approval
Before the study, permissions were obtained from the local ethical committee.

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