Case Report

Endoscopic Calcaneoplasty with Ultrasonic Bone Cutting Assisted for Haglund's Syndrome

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The authors report a case of a 32-year-old male presented with right heel pain for two years. He was diagnosed with retrocalcaneal bursitis and Haglund's deformity, known as Haglund's syndrome, and failed conservative treatment. The present showed a surgical technique for endoscopic calcaneoplasty that is minimally invasive for resecting inflamed retrocalcaneal bursa and posterosuperior part of calcaneus with ultrasonic bone cutting instrument assisted to remove bone that is closed to Achilles tendon because blunt ultrasonic blade that oscillates at over 22,500 cycles/s with an slight microscopic amplitude can cut bone accurately while preserving adjacent soft tissues. The patient had excellent results and completed postoperative program satisfactorily.

Keywords: *Haglund's deformity, Haglund's syndrome, Retrocalcaneal bursitis, Posterosuperior calcaneal prominence, Endoscopic calcaneoplasty*

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Haglund's syndrome or "pump-bump" is first described in 1928 by a Swedish orthopedic surgeon named Patrick Haglund[1]. He described a patient with painful hindfoot caused by bony prominence at superolateral portion of calcaneal tuberosity that may be associated with inflammation of retrocalcaneal bursa, which normally protects the Achilles tendon from calcaneal tuberosity. However, in Haglund's syndrome there is inflammatory or degenerative changes within the insertion of Achilles tendon, with or without ossification[2].

On physical examination, a bony prominence can palpate at this location, and pain is typically located in the retrocalcaneal bursa just anterior to the insertion of the Achilles tendon. Swelling can be seen on both sides of the tendon at the level of the posterosuperior calcaneal prominence, and retrocalcaneal pinch test is usually positive by squeezing pressure just anterior to the Achilles' tendon insertion.

Patients are initially treated conservatively, including Achilles stretching exercises, night splinting, oral non-steroidal anti-inflammatory drugs (NSAIDs), cold compression, and wearing a protective silicone in closed back shoes, heel lift, or open back shoes altogether. Six weeks of short-leg casting may be necessary to resolve acute inflammation if the above treatments fail. There are essentially two distinct operative methods: open and endoscopic surgical techniques[3-8]. Complications from open surgical technique include soft tissue breakdown, Achilles tendon avulsion, recurrent pain, scar tenderness, altered heel sensation, deep vein thrombosis, and stiffness[9,10]. Van Dijk[11] reported the first series of endoscopic calcaneoplasty in 2001 through medial and lateral portals in a prone position. This technique has been used successfully in selected cases, with pathologies limited to retrocalcaneal bursitis. In this study, the authors experienced difficulty using mastoid burr to resect calcaneal tuberosity without risking to damage or tear Achilles tendon; therefore, ultrasonic surgical instrument was used to resect this bone because theoretically it could efficiently cut bone without damaging adjacent soft tissues[12]. Post-operative program allowed the patient to bear weight and motion of ankle as tolerated, thereby reducing risk of deep vein thrombosis and joint stiffness.

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Case Report

A 32-year-old male presented with right heel

pain for 2 years, in which the pain was worsened at night and aggravated by walking long distances. Physical examination showed swelling and tenderness upon palpating mediolateral just anterior to the Achilles tendon insertion, without direct tenderness on the posterior heel. He had limited dorsiflexion of right ankle due to Achilles tendon tightness.

Plain x-ray of the foot showed posterosuperior bony prominence, suggestive of Haglund's deformity. He then subsequently underwent conservative treatment with NSAIDs, physiotherapy, and six weeks of short-leg casting without any relief.

Surgical technique

The patient was operated under spinal anesthesia with tourniquet applied over the thigh. The patient was then placed in prone position with the ankle hanging freely over the edge of the operating table to allow full range of movement during the procedure (Fig. 1B). A support was placed below the leg for maneuverability with instruments. Fluoroscope was used to identify broader view of posterosuperior bony bump and placed needle gauge No. 18 (Fig. 1C). The lateral portal was made first, just lateral of the Achilles tendon at the level of the superior aspect of the calcaneus.

This portal was produced as a small vertical incision. Subcutaneous layer was split by hemostat. The retrocalcaneal space was penetrated by a blunt trocar before arthroscope was inserted. Make the medial portal at the same level, just medial to the Achilles tendon, and insert a hemostat through the skin incision, directing it to contact the arthroscope. 4-mm shaver was inserted and used to debride soft tissue on the bone side and tendon side. The Achilles tendon was protected by keeping the closed end of the shaver against the tendon. The bone was resected with a mastoid burr (Fig. 2) except the bone that closed to Achilles tendon, it is difficult to resected by mastoid burr (Fig. 3A arrow ↓) ultrasonic surgical instrument (Fig. 2) was used to resected this bone (Fig. 3C). Retro calcaneal bursa and superior tuberosity of calcaneus was shaved off. Both the resector and scope were interchangeably used through both the portals. The Fluoroscope was used to confirmed that posterosuperior bony bump was resected (Fig. 3E). The skin was closed with nylon 4.0 sutures. A sterile compression dressing was applied (Fig. 4).

Post-operative

The patient was allowed to bear weight as tolerated and was instructed to elevate the foot when not walking. The patient was discharged after intravenous antibiotics on post-operative 24 hours. The sutures were removed on day 14. The patient was encouraged to do Achilles tendon stretching and return to wearing regular shoes as soon as tolerated.

Results

The Patient's pre-operative AOFAS (American Orthopedic Foot and Ankle Society) Ankle-Hindfoot Scale Score was 70 and VAS was 9. On Post-operative day 2, AOFAS score was 74 and VAS was 6. The 2nd-week follow-up AOFAS score was 70 and VAS was 3. The 18th-week follow-up AOFAS score was 100 and VAS was 1. The 22nd-week follow-up AOFAS score was 100 and VAS was 0. The patient had postoperative complication of swelling for 18 weeks and mild numbness at posterolateral aspect of the heel for 22 weeks. He can fully dorsiflexion of right Ankle at 22

Fig. 1 Preoperative preparation (A) pre-op x-ray showing bony overgrowth (B) position on operation table (C) needle gauge No. 18 was placed to marked the resection area.

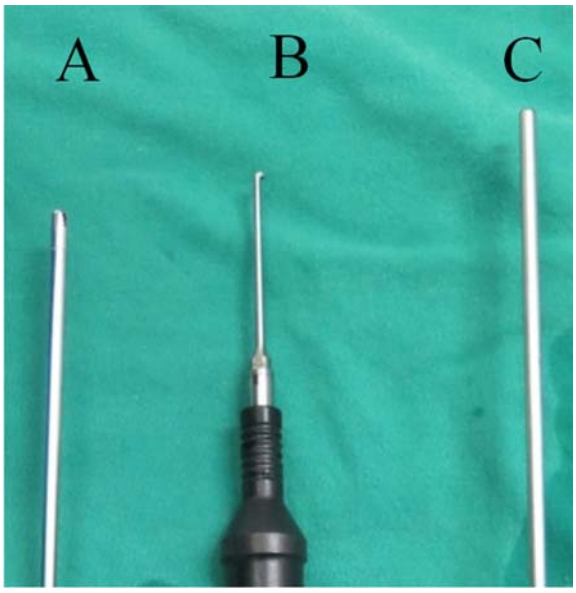

Fig. 2 Surgical equipment A) mastoid burr; B) ultrasonic micro hook; C) shaver.

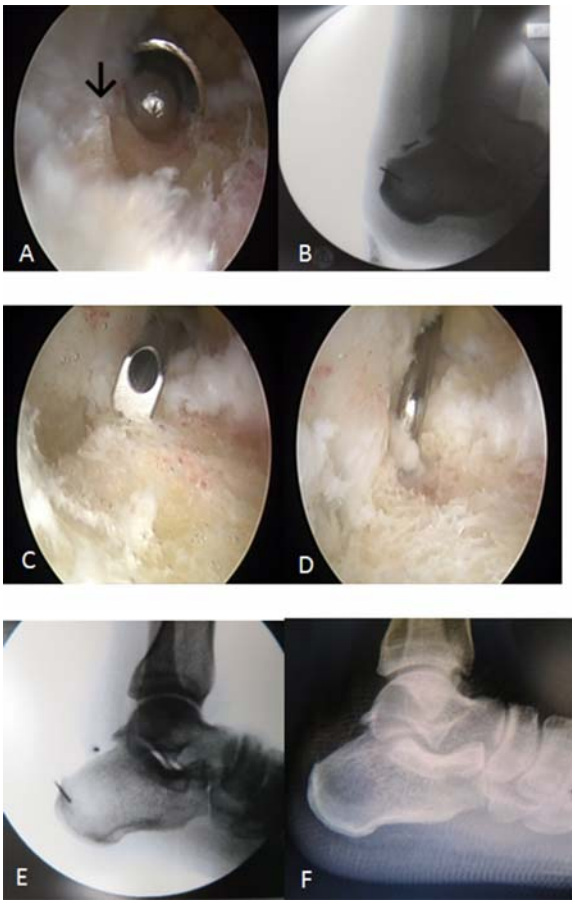

Fig. 3 Endoscopic images and fluoroscope: (A), posterosuperior bony bump was resected by mastoid burr and bony bump that difficult to resected by mastoid burr (black arrow); (B), fluoroscope was used to check bony bump that closed to Achilles tendon was not resected; (C), ultrasonic surgical instrument was used; (D), bony bump that closed to Achilles tendon was resected; (E), fluoroscope was used to check bony bump that closed to Achilles tendon was resected; (F), post-operative radiograph.

weeks and patient satisfaction on 2nd-week follow-up was 90%.

Discussion

Chronic retrocalcaneal bursitis due to Haglund's deformity may be difficult to treat effectively by non-operative measures alone, and local steroid injections in the retrocalcaneal bursa are not advised due to risk of tendon rupture. Many surgical options are available for who fail conservative treatment, including calcaneal osteotomy with or without Achilles tendon debridement, excision of the retro calcaneal bursa, and calcaneal osteotomy[13-16]. Unfortunately, none of these procedures yield a consistent outcome, and complications from the open procedures include soft tissue breakdown, Achilles tendon avulsion, recurrent pain, scar tenderness, altered heel sensation, and stiffness. Endoscopic calcaneoplasty offers a good, minimally invasive alternative to open surgery. Surgeons familiar with endoscopic approach tend to favor this procedure because of its superior visualization, thereby limiting risk of weakening or rupturing tendon as in open procedure. Post-operative stiffness is also less likely due to early mobilization and weight bearing as tolerate. However, a challenge for endoscopic calcaneoplasty by using a mastoid burr to resect calcaneal tuberosity is the difficulty to resect the bone adjacent to Achilles tendon without damaging it. Therefore, we used ultrasonic surgical instruments to assist the resection of this bone due to the ability of blunt ultrasonic blade that oscillates at over 22,500 cycles/s with an slight microscopic amplitude that accurately pulverize any bony structure in contact without damaging nearby soft tissue. Accordingly, this device is safe and effective and can be used to facilitate osteotomies in a variety of spine surgeries[17,18]. Lim et al[19] showed the result of open calcaneoplasty, with the mean VAS at six months was 2.3 and the mean AOFAS score was 81.3, compared to our patient, VAS at six months was 0 and the AOFAS score was 100 showing better results in both scores.

Fig. 4 Compression dressing was applied.

The patient recovered from pain, had a good functional outcome after treatment, could return to work in a few weeks, with no iatrogenic Achilles tendon rupture. Postoperative complication of mild numbness at posterolateral of the heel may occur from neurapraxia of the branch of sural nerve and it was full recovery at 22 weeks.

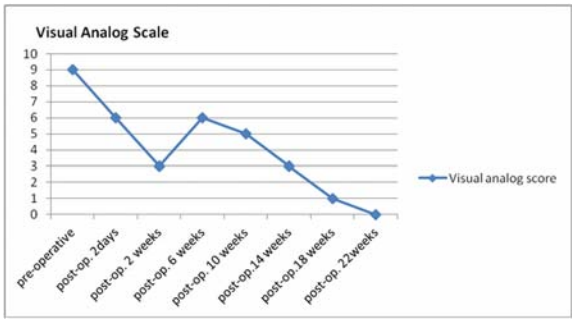

Fig. 5 Pre-operative and post-operative visual analog scales.

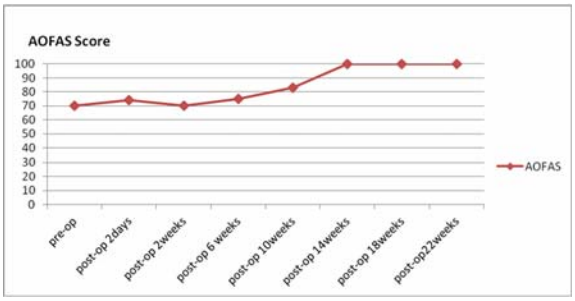

Fig. 6 Pre-operative and post-operative American Orthopedic Foot and Ankle Society Score (AOFAS).

Conclusion

Endoscopic calcaneoplasty with ultrasonic-assisted bone cutting for Haglund's syndrome has demonstrated several advantages to open surgery, including superior VAS and AOFAS at 6 months after surgery, low morbidity, excellent scar healing, short recovery time, and no Iatrogenic Achilles tendon rupture The authors conclude that, if this is done by an experienced arthroscopist it serves as an excellent alternative to the open approach for Haglund's syndrome.

What is already known on this topic?

Chronic retrocalcaneal bursitis due to Hugland's deformity may be difficult to treat effectively by non-operative measures alone. The various surgical options available for patients with Haglund's deformity who do not respond adequately to non-operative therapy. The endoscopic calcaneoplasty is an excellent alternative to the open method.

What this study adds?

Endoscopic calcaneoplasty with ultrasonic bone cutting Assisted for Haglund's deformity is effective for remove Retro calcaneal bursa and superior tuberosity of calcaneus.

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Potential conflicts of interest

None.

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รายงานผู้ป่วยภาวะ Haglund's syndrome ที่ได้รับการผ่าตัดด้วยวิธี Endoscopic calcaneoplasty โดยใช้อุปกรณ์ตัดกระดูก ultrasonic ช่วยในการผ่าตัด

ชัชวาลย์ เจริญธรรมรักษา, ศุภกิจ พิมลธเรศ, พิชญา เพชรบรม

รายงานผู้ป่วยชายอายุ 32 ปี มีอาการปวดส้นเท้าข้างซ้ายมา 2 ปี ได้รับการวินิจฉัยเป็น retrocalcaneal bursitis และ Haglund deformity ได้รับการรักษาแบบไม่ผ่าตัดอย่างเต็มที่แต่อาการไม่ทุเลา รายงานนี้เป็นการกล่าวถึงวิธีการผ่าตัดส่องกล้องเข้าไปตัดแต่งกระดูก calcaneus และ retrocalcaneal bursa ซึ่งเป็นวิธีที่ทำให้เกิดบาดแผลน้อยและใช้อุปกรณ์ ultrasonic ในการช่วยตัดกระดูกที่อยู่ชิดกับเอ็นร้อยหวายเพื่อช่วยตัดกระดูกที่มีปัญหาได้หมด โดยไม่เกิดการบาดเจ็บต่อเอ็นร้อยหวายผู้ป่วยได้ผลการผ่าตัดที่ดีและมีความพึงพอใจหลังผ่าตัด