Haglund Syndrome with Pump Bump

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Haglund’s syndrome, which is an inflammation of the bursa and a bony enlargement on the back of the heel that most often leads to painful bursitis, is a rare cause of retrocalcaneal pain. The clinical diagnosis is often confusing as the clinical picture may mimic other causes of hindfoot pain such as isolated retrocalcaneal bursitis or hindfoot involvement from more systemic disorders such as seronegative spondyloarthropathies (Reiter’s syndrome, ankylosing spondylitis) or rheumatoid arthritis. This report is of a 60-year-old woman with a painful swelling of the right heel, who was diagnosed with Haglund syndrome. The characteristic clinical photograph (showing the prominent ‘pump bump’), radiographical and magnetic resonance imaging features are presented. Key words: Haglund Syndrome; Pump Bump; Retrocalcaneal pain; Hindfoot pain

1. INTRODUCTION
Posterior heel pain is a common problem and may result from a variety of causes. Pain in the posterior area of heel may have different causes such as calcaneal fracture, insertion tendinitis of the Achilles tendon, Achilles para-tendinopathy, periostitis of calcaneus, superficial calcaneal bursitis and retrocalcaneal bursitis (1). Originally, Haglund described pain in the hindfoot caused by a prominent postero-superior corner of the calcaneus in combination with wearing a rigid low-back shoe (2). The condition is characterised by a prominent posterior bursal projection of the calcaneum, Achilles tendinosis, and inflammation of the retrocalcaneal and retroachilles bursae (3). Haglund Syndrome (HS) is often called “pump bump” because the rigid backs of pump-style shoes can create pressure that aggravates the enlargement when walking. In fact, the deformity is seen most commonly among the young women who wear pumps (4).

Haglund’s deformity must be differentiated from HS, which involves a painful swelling of an inflamed retrocalcaneal bursa, sometimes combined with insertional tendinopathy of the Achilles tendon. It must also be distinguished from Haglund’s disease, which is the term of osteochondrosis of the accessory navicular bone (1, 3, 4).

We report a case of HS, diagnosed clinically and confirmed radiographically and treated with conservative treatment modalities.

2. CASE REPORT
A 60-year-old woman presented in physical therapy and rehabilitation clinic with pain which was aggravated by activity and shoe wear in the area where the Achilles tendon attaches to the heel at the right side for 1 year. She notices that the pain is most pronounced when arising from seated position or when arising from bed in the morning. She had a history of a mechanical bilateral knee pain, but was otherwise in good health and there was no trauma that may cause a pain. At physical examination, there was a noticeable bump and tender swelling at the Achilles tendon insertion of the right heel (Figure 1). Subtalar joint range of motion was decreased in dorsiflexion, plantarflexion, inversion, and eversion. Thompson test revealed an intact Achilles tendon.

Lateral radiograph of the right ankle showed soft tissue swelling at the insertion of the Achilles tendon, ossifications within the thickened Achilles tendon suggesting tendinosis, a prominent osseous protuberance at the bursal projection of the calcaneum, and an increase in density of the retrocalcaneal bursa suggesting bursitis. No cortical erosion was present (Figure 2).
Laboratory studies revealed a normal hemogram, erythrocyte sedimentation rate, reactive C-protein, liver function, serum sodium, potassium, calcium, phosphorus and urinalysis. Sacroiliac imaging studies were normal.

Magnetic resonance imaging (MRI) subsequently revealed hypertrophy of the calcaneum at the bursal projection, associated with marrow oedema. Increased T2-weighted signal intensity in the thickened Achilles tendon and a thin rim of circumferential high signal intensity were indicative of Achilles tendonitis. Small dystrophic ossifications were present in the distal insertion of Achilles tendon. Fluids in the retrocalcaneal and retro-Achilles bursae were compatible with bursitis (Figure 3).

Our patient was treated conservatively. Oral and topical anti-inflammatory medications were given to reduce pain and inflammation. To reduce swelling, cold pack applied to the affected area 3 times a day, for 20 minutes. Conventional TENS and pulse ultrasound therapy were applied once a day to reduce the pain and inflammation, during 15 days. She performed stretching exercises to prevent the Achilles tendon from tightening. She was only allowed to wear appropriate shoes and forbidden to wear pumps and high-heeled shoes. Placing pads inside the shoe cushions was recommended. A considerable improvement was obtained with a significant pain relief within three weeks.

3. DISCUSSION

HS was first described by Patrick Haglund in 1927 (2). This author established a connection between posterior heel pain, a visible and palpable soft tissue swelling, a pointed posterolateral calcaneal prominence, and wearing low back shoes (2). In 1982, Pavlov et al. (5), described the ‘HS’ as a cause of posterior heel pain, characterized by a painful soft tissue swelling at the level of the Achilles tendon insertion. Using a lateral heel radiograph, they described a prominent calcaneal bursal projection, retrocalcaneal bursitis, thickening of the Achilles tendon, and a convexity of the superficial soft tissues at the level of Achilles tendon insertion (5). Haglund’s deformity was then described by Vega et. al (6); as a tender swelling in the region of Achilles tendon with visible prominence of the postero-lateral aspect of calcaneus. In their opinion, the superficial Achilles bursa and/or the retrocalcaneal bursa were affected by the enlarged prominence of calcaneus (6).

Patients with HS range in age from young adult to elderly, are of either sex although the condition is more common among women (7). The patients may have varying patterns of daily life activities (8). To some extent, heredity may play a role in HS. People can inherit a type of foot structure that makes them prone to developing this condition. For example, high arches can contribute to HS (8). The Achilles tendon attaches to the back of the heel bone, and in a person with high arches, the heel bone is tilted backward into the Achilles tendon. This causes the uppermost portion of the heel bone to rub against tendon (7, 8). Eventually, due to this constant irritation, a bony protrusion develops and the bursa becomes inflamed. It is the inflamed bursa that produces redness and swelling associated with painful soft tissue swelling, the so-called ‘pump bump’, at the level of the Achilles tendon insertion (4, 5).

A tight Achilles tendon may also play a role in Haglund’s deformity, causing pain by compressing the tender and inflamed bursa (6). In contrast, a tendon that is more flexible results in less pressure against the painful bursa. Another possible contributor to HS is the tendency to walk on the outside of heels. This tendency, which produces wear on the outer edge of the sole of the shoe, causes the heel to rotate inward, resulting in a grinding of the heel bone against the tendon. The tendon protects itself by forming a bursa, which eventually becomes inflamed and tender (6, 8).

The condition is usually diagnosed by a combination of clinical and radiological assessments. Plain radiograph in a lateral standing position is useful to assess the presence of a prominent bursal projection of the calcaneum, the Haglund deformity (3, 5). Different objective radiographic assessment methods, including the parallel pitch line and...
posterior calcaneal angle or Fowler’s angle, are well described (5, 7). However, these methods do not always agree with the clinical symptoms. Assessment of the soft tissue detail is therefore crucial for making the diagnosis. Loss of a lucent retrocalcaneal recess is an important indication of underlying retrocalcaneal bursitis. The Achilles tendon is swollen, and dystrophic calcifications may also be seen (7, 8). Superficial bursitis usually manifests as soft tissue swelling and convexity of the soft tissue posterior to the Achilles tendon insertion (5, 7).

MRI may be required for ambiguous or clinically equivocal cases. With its superior soft tissue and bone marrow signal contrasts, and multiplanar capability, MRI is more sensitive for making diagnosis and assessing the severity of disease (9). The cardinal soft tissue abnormalities, namely Achilles tendinopathy, and retrocalcaneal and retrocalcaneal bursitis are more easily and directly depicted by MRI, with increased signal intensity demonstrated within the pump bump and Achilles tendon on T2-weighted sagittal images (7, 9). The detection of marrow oedema within the prominent bursal projection is likely to support the repetitive mechanical compression and inflammation as the pathological mechanism in this condition (7, 9).

The differential diagnoses, including systemic inflammatory articular disorders such as Reiter syndrome and rheumatoid arthritis, are difficult to distinguish clinically (1, 5, 7). In contrast to HS, the pump bump associated with these inflammatory arthritic diseases are more diffuse and they are associated with cortical erosions of the bursal border of the calcaneum (8). Therefore, a careful search of any cortical erosions along the posterosuperior bursal surface of the calcaneum at MRI is important (9).

In non-surgical treatment of Haglund’s deformity it is aimed to reduce inflammation of the bursa. While these approaches can resolve the bursitis, they will not shrink the bony protrusion (7, 10). Anti-inflammatory mediations may help reduce the pain and inflammation. Some patients also find that a topical pain reliever, which is applied directly to the inflamed area, is beneficial (5, 7, 10). To reduce swelling, cold pack can be applied. Stretching exercises help relieve tension from the Achilles tendon. These exercises are especially important for the patient who has a tight heel cord (5, 7). Patients with high arches may find that heel lifts placed inside the shoe decrease the pressure on the heel. Placing pads inside the shoe may help reduce irritation when walking. Wearing shoes that are backless or have soft backs will avoid or minimize irritation (5, 7). Inflammation and pain are sometimes reduced with certain forms of physical therapy, such as ultrasound and TENS therapy. In some cases, casting may be necessary to reduce symptoms (4, 5, 7).

Corticosterone injections to relieve the inflammation in the bursa or tendon are somewhat controversial, as they have been known to lead to rupture of the Achilles’ tendon. However, a newer practice of using ultrasound to guide the injection may result in fewer drawbacks to this type of treatment (11). Early, aggressive treatment of inflammation around heel bone may prevent HS and helps keeping out of the surgical suite (4, 5, 7, 11).

If non-surgical treatment fails to provide adequate pain relief, surgery may be needed. Surgical treatment options, including retrocalcaneal decompression and calcaneal osteotomy or osteotomy, have varying results (10). Inadequate bone resection can lead to recurrence of symptoms, with other postsurgical complications potentially including scar formation with nerve entrapment, weakening or rupture of the Achilles tendon, and nonunion of the calcaneal osteotomy (10). It is important using arch supports or orthotic devices with appropriate shoes and performing stretching exercises to prevent the Achilles tendon from thickening (10).

Posterior heel pain of the HS is associated with visible and palpable “pump-bump”. In this syndrome, there is a thickening of the soft tissues at the insertion of the Achilles tendon (4, 5, 8). It is seen in those who were stiff shoes with a shallow heel while engaging in strenuous activity; it is characterized by a radiographically prominent calcaneal enlargement at the insertion of the Achilles tendon, retrocalcaneal bursitis, thickening of the Achilles tendon, and a convexity of the superficial soft tissues at the level of the Achilles tendon insertion (8). The degree of enlargement is measurable by radiography. Treatment is typically conservative and includes NSAIDs and ice therapy, heel cord stretching exercises and wearing open-backed shoes rather than high-heeled shoes. Majority of most cases at an early stage can be treated without needs of any surgery (4, 5, 7, 8).

**REFERENCES**