Review of Causes and Treatment in the Athlete with Heel Pain

Physical Therapy in Merrimack Valley for Foot

Most athletes really depend on their feet and ankles to propel them during sports activities. Running and jumping can become huge problems when the athlete experiences heel pain of any kind. The two most common heel problems affect the plantar heel (underneath) and the posterior heel (back of heel). In this review article, the diagnosis and treatment of four specific problems are addressed. These include 1) insertional Achilles tendon disorders, 2) plantar fasciitis, 3) plantar fascia rupture, and 4) calcaneal stress fractures.

Heel problems are not confined to these four groups. Other soft tissue disorders, bone disorders, and nerve problems can result in plantar or posterior heel pain. It's even possible to experience heel pain as a result of lumbar spine disorders, metabolic disorders (e.g., Paget disease, sickle cell disease), tumors, and degenerative joint disease (arthritis). But the authors restricted the content of this article to the four most common problems encountered in a sports medicine practice.

Insertional Achilles tendon disorders develop as a result of overtraining, poor footwear, postural problems, and bumping up the training schedule too fast. Heel pain develops near where the Achilles tendon inserts into the calcaneus (heel bone). This can occur as a result of bursitis (inflamed bursa), tendinitis (inflamed tendon), tendinosis (tendon degeneration without inflammation), or pump bumps. It can be unilateral (one side) or bilateral (both sides). Pump bump is an area of bone enlargment like a bone spur over the posterolateral calcaneus (heel bone). Posterolateral refers to the location: back and slightly to the side of the calcaneus. The bump rubs on the back of shoes and causes pain, tenderness, and skin thickening or callous formation on the outside.

Plantar fasciitis is a fairly common problem in middle-aged women, possibly related to menopause. But when it occurs in a young athlete, other causes must be considered. First, what is the training level? Is the athlete running hills everyday for long hours? Has the affected athlete recently bumped up his or her training schedule? Is the Achilles tendon tight with limited ankle motion? Plantar fascia problems can be limited to plantar fasciitis but the fascia can also rupture or tear. Fracture of the calcaneus can also occur when the plantar fascia gets torn or disrupted.

How can the orthopedic surgeon tell what's causing the heel pain? Location of symptoms is the first place to start. The examiner will also ask the patient what makes it better or worse, and what structures hurt when pressed or palpated. The presence of any visible changes (e.g., skin thickening, bony bump, swelling around the Achilles) will be noted. X-rays can help show areas of calcification (bone build-up from a pump bump) or bone breakdown around the area of a bone bump from chronic inflammation (bursitis).

Plantar fascia ruptures occur with a painful pop and sudden inability to stand on that foot, run, or push off with the toes. Swelling, bruising, and pain along the bottom of the foot are obvious signs and symptoms. Sometimes plantar fascia rupture leads to the fourth of our conditions: calcaneal stress fracture. Tiny cracks in the heel bone develop either as a result of plantar fascial rupture or in athletes who have increased their training and sports activity. At first, X-rays may not show anything, but after the body starts the bone healing process, there is evidence of the fracture. Usually this isn't seen until six weeks after the original symptoms developed. Physicians tend to rely on the calcaneal squeeze test to diagnose stress fractures.

Most plantar fascia problems are worse in the morning. In fact, standing up after getting out of bed can be the worst of the painful symptoms. With insertional tendon problems, going up stairs or climbing hills makes the pain worse. Touching the area over the tendon is tender when the problem is caused by tendinitis. The inflamed bursa is not

tender to touch but applying a 2-finger squeeze test on either side of the Achilles tendon while the ankle moves up and down and side to side reproduces bursitis pain.

Treatment always depends on the underlying cause of heel pain. That's why a careful diagnostic sorting process is important and an understanding of what each condition is and how it presents clinically. Imaging tests start with X-rays. MRIs may be ordered when there is suspicion of plantar fascia rupture or calcaneal fracture.

Treatment can be categorized based on the four main types of heel problems. For example, insertional tendon disorders are most often treated conservatively with antiinflammatory medications, ice massage, rest, and activity modification. For the running athlete, this means backing off on daily/weekly mileage and avoiding hills or hard surfaces such as asphalt or concrete.

A Physical Therapist can advise patients on how to gently stretch the Achilles tendon and gastrocnemius (calf) muscle. Shoes may be changed to a backless or soft counter, possibly with a heel lift or heel cup inside. The counter is the part of the shoe that goes around the back of the heel. Other types of treatment (e.g., radiofrequency, shockwave therapy) are under investigation but there have been no studies published supporting these yet.

When all these measures fail to give the athlete relief from painful symptoms associated with insertional Achilles tendon disorders, then surgery may be considered. The exact procedure performed will depend on the cause of the problem. Chronically inflamed bursae, bone spurs (calcium build up on the heel), or degenerated tendons fibers may be removed. This type of surgery is referred to as decompression as pressure from the offending structure is alleviated by removing it.

Plantar fasciitis may resolve with nonoperative care much like what is used for insertional Achilles tendon problems -- activity modification (stop running!) is aided by proper footwear, pain relievers and antiinflammatory medications, stretching the soft tissues, and strengthening the calf muscles. Some early studies show that high-energy shock wave therapy is helpful for chronic plantar fasciitis. How and when to use this modality for the best results remain to be determined.

And like treatment for insertional Achilles tendon problems, treating chronic plantar fasciitis may require surgery. If there's been no change in symptoms after at least six months of nonoperative management, then surgery may be the next best option. Decompressive surgery is done to remove pressure from around the plantar nerve. Corticosteroid injections are not recommended for this problem. They can lead to plantar fascia rupture and/or calcaneal fractures because of the local weakening of soft tissues and bone created by the steroid.

For the athlete with a suspected or confirmed plantar fascia rupture or calcaneal fracture, nonweight-bearing immobilization is required. After a week to 10 days, the athlete may be given permission by the orthopedic surgeon to start putting some weight on that side. In the case of plantar fascia rupture, the cast is eventually replaced by a rigid-sole shoe. The entire progression from cast to shoe is about a month but permission to return to the field usually isn't given for another two or three months. Fractures are treated with nonimpact weightbearing until the pain goes away. Then the athlete is allowed to slowly return to weight-bearing activities, especially load bearing activities. This progression takes about eight weeks.

The authors conclude that a proper diagnosis and treatment specific to the problem is the best way to avoid complications and progression of heel pain in the athlete. Conservative care is usually all that's needed to avoid moving from the acute phase to chronic symptoms in these patients. Surgery is avoided when at all possible, but when it's needed, decompression is usually the best way to address many problems involving bone bumps, compression on nerves, and tendon degeneration.

Reference: Kenneth John Hunt, MD, and Robert B. Anderson, MD. Heel Pain in the Athlete. In Sports Health. September/October 2009. Vol. 1. No. 5. Pp. 427-434.