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Court Side : 1 June 2010

A Back2Sports Sports Injury Management Newsletter

Midportion Achilles Tendinopathy: Eccentric exercises show promising effects

Achilles tendinopathy is one of the most common overuse injuries among recreational athletes with a prevalence of 11%. It is mainly seen in runners but it is not uncommon amongst people who don't participate in sports. The tendinopathy is classified as *insertional* (when within 2cm of its insertion) or *midportion* (when 2-6cm proximal to its insertion) Achilles tendinopathy.

The Achilles tendon is formed from the gastrocnemius and the soleus muscles and inserts at the calcaneus. It also connects to the plantar fascia whereas the two structures act as a continuum. The insertion of the tendon is protected by two bursas, the retrocalcaneal (between the Achilles and the skin) and the retro-Achilles (between the Achilles and the calcaneus).

Blood supply to the tendon is provided by the musculotendinous junction and through its attachment to the periosteum. The area 2-6cm above the tendons insertion has been proposed to have poor vascularity, which might explain why it is prone to injury.

The Achilles tendon has two functions - to transmit forces from the muscles to the bone and to absorb ground reaction forces that could cause injuries to the muscles. The tendon is able to withstand a large amount of forces. It is estimated during sprinting, loads can reach as high as 12.5 times body weight.

Microtrauma

The fibres of the tendon have a wavy arrangement that is lost when it is stretched

by more than 2%. Microtrauma starts to occur when tensile forces cause elongation to the tendon to reach a critical point at 4% of its original length. When elongation reaches 8%, macroscopic rupture occurs.

An acute injury follows the stages of a normal healing process whereas chronic injuries do not seem to follow the same procedure. The microtrauma caused to the tendon does not produce inflammation, thus there is poor healing of the tissues. Although, there is not a true tissue inflammation in Achilles tendinopathy, evidence of neurogenic inflammation exists. Excitatory neurotransmitters such as substance P, CRGP and glutamate have been found in symptomatic chronic tendinopathies and can trigger pain.

Special attention should be given when the pain is located in the insertion of the Achilles to the calcaneus, because the two bursas mentioned above can be involved in the patient's symptoms. In addition, Achilles insertional tendinopathy has the same characteristics as mid-portion tendinopathy. Thus differential diagnosis is important since the therapy for each condition can be different.

Differential Diagnosis

The following conditions can mimic mid-portion Achilles tendinopathy and should be considered to rule out:

- Insertional Achilles tendinopathy
- Tendon rupture (rule out with calf squeeze test)

- Paratendonitis
- Retrocalcaneal bursitis (presents as a prominent warm area of the posterosuperior lateral aspect of the heel)
- Retro-Achilles bursitis (pain presents as very superficial and the area of the posterior heel is warm)

Despite intensive investigations, the exact cause and pathogenesis of Achilles tendinopathy is poorly understood. However, several conservative treatment approaches such as Extracorporeal Shock Wave Therapy (ESWT), local corticoid injections, ultrasound and night splints showed promising effects. Eccentric exercises especially seem to have the most evidence in the effectiveness in the treatment for midportion Achilles tendinopathy (Magnussen, Dunn & Thomson 2009).

Symptoms & Diagnosis:

The clinical diagnosis of Achilles tendinopathy is indicated when the combination of Achilles tendon pain, swelling, and impaired performance is present. The chronic form of Achilles tendinopathy is not an inflammatory condition.

Patients typically present with:

- morning stiffness at the calf
- pain at the initiation of exercise and immediately after training
- heat, crepitation and increased erythema around the tendon
- pain even at rest in chronic stages

They are restricted in activities such as running, jumping, hopping, sprinting and sometimes even walking.

Contributing factors in sports include rapid increase in mileage, or running on sloping, hard or slippery roads can contribute to tendon overload. Among athletes, biomechanical factors including excessive subtalar joint pronation, limited passive dorsiflexion or subtalar joint mobility, and leg length discrepancy have been considered predisposing factors for Achilles tendon injuries.

Management for midportion Achilles tendinopathy

There are several conservative treatment approaches which include:

- eccentric exercises
- ESWT
- local corticoid injections
- ultrasound
- night splints

In its early phases, Achilles tendinopathy often responds positive to conservative treatment whereas surgery is considered an acceptable choice for patients who have failed to respond to conservative treatment.

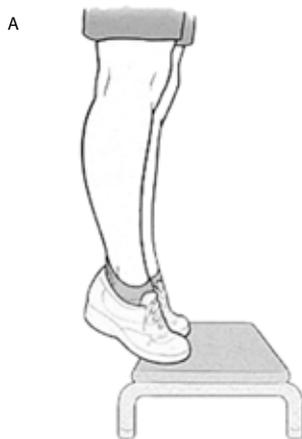
Physiotherapy management consists of a comprehensive assessment of the whole kinetic chain of the lower limb. This includes the analysis of:

- gait
- running and jumping
- joint mobility
- soft tissue
- biomechanical factors

Depending of the results of the assessment, the treatment targets on:

- mobilizing stiff joints
- strengthening and stretching of muscles which contributed to the biomechanical faults in walking and running
- soft tissue releases
- correction of walking and running pattern
- simple advice on footwear

Furthermore, the role of a Physiotherapist is to teach the patient to perform the eccentric exercises correctly and monitor



their symptoms at the same time.

Eccentric exercises during a 12 week program showed 60-90% positive results in decreasing pain in several randomized controlled trials. This evidence, combined with their low cost and low risk, makes these exercises ideal first-line therapy (Magnussen, Dunn & Thomson 2009).

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