

# Achilles Tendinopathy – a soft tissue therapy approach

*By James Barker*

*Achilles Tendinopathy is a poorly localised, post inflammatory breakdown of the achilles tendon and its associated structures. In this article James Barker reviews the pathology, clinical relevance and possible treatment options available to soft tissue therapists.*

Achilles Tendinopathy (AT) is a chronic, yet common condition in sports people and recreational athletes although not exclusive to this population. Treatment options have been limited in the past because of poor understanding of the pathology and its aetiology. Recent research into this condition has revealed valuable information that has given us further treatment options.

## **Anatomy**

The Achilles tendon forms from the gastrocnemius and soleus distally and inserts on the calcaneus (heel bone). The musculotendinous junction forms approximately six centimetres above the insertion of the Achilles. The strong collagen fibres of the Achilles tendon form a linear arrangement encased in a strong sheath. The sheath has three layers reducing friction of the tendon and the surrounding fascia.

The tendon itself has a very poor blood supply, hence it recovers slowly after injury. Two bursae lie in this region. One is the subcutaneous Achilles bursa lying two centimetres above the insertion and just beneath the skin. The other is the retrocalcaneal bursa lying lateral and inferior to insertion point.

## **Pathogenesis**

AT differs from Achilles Tendinitis in that there is no inflammatory condition present and therefore a very poor healing response. A lack of inflammatory cells makes way for an increase in fibrotic/degenerative tissue weakening the existing tissues of an already overloaded tendon. Since tendons possess a very slow metabolism the lay down of collagen and repair is very slow.

In a healthy tendon the collagen fibres show a linear type arrangement allowing high tensile strength abilities enabling the Achilles to transmit forces to and from the foot, particularly in eccentric actions. With a degenerative tendon the fibres show a wavy like appearance and hence will not be able to effectively transmit these forces.

We are also now able to see (under Doppler ultrasound) that in most chronic cases (6-18 months) there is a chronic embarrassment of blood vessels to the affected area. These blood vessels are not seen in healthy tendon. What we do not fully know is whether these blood vessels are a causative factor of pain/degeneration or a result of the condition. What is known however, is that when the vascular bunches are removed there is a significant decrease in pain to the area.

Further research is necessary to ascertain what involvement these blood vessels have with regard to pain and why they begin growing through the tendon. As soft tissue therapists we need to keep in mind that chronic cases of AT may possess these blood vessels causing ineffective treatment outcomes. Don't hesitate to refer to a sports physician for further investigation.

### **Signs and symptoms**

Degeneration/breakdown of the collagenous fibres (known as tendinosos) presents as a thick and 'gratey' tendon to palpate and also to move passively through range. Onset is gradual and hence most cases have been through more than one inflammatory stage. Continued inflammation, rest, inflammation, rest, etc will eventually lead to a build up of fibrotic tissue which, as we know, is weak and dysfunctional. The tendon may or may not be tender, however palpable nodules approximately two to six centimetres above the insertion are common.

Stiffness of the talocrural joint is a common symptom and this may be a primary or secondary factor, however is prevalent in many AT cases. Most patients will present with very tight and/or thick soleul fascia and sometimes an accompanying decrease in tone of the gastrocnemius muscle leaving the tendon to take the load. Pain is usually accompanied on trying to load the tendon.

### **Aetiology:**

- Overuse/overload of repetitive motions particularly those that contain an eccentric component e.g. running, jumping, plyometric type movements (sports that contain a concentric phase only are less likely to experience AT problems since eccentric actions cause microtears at a cellular level)
- Microtears over a long period of time such as training for a marathon on hard surfaces significantly increase chances of injury.
- Muscular imbalance (weakness) of the gastrosoleus complex – loading the tendon instead of the muscle eccentrically controlling motion
- Training factors such as – increase in intensity, increase in volume, weakness of abdominopelvic stabilizers, pronation/foot positioning.

### **Assessment:**

- thickening of achilles tendon – is one thicker than the other? Are the feet aligned or do they roll in giving the tendon a bowed appearance?
- pain and movement quality on single hop – is there pain on hopping ? Does the tendon contract and extend is it stiff ?
- lunge wall test (assessing flex of soleus and joint) dorsiflexion range of motion should be at least eight to nine centimetres
- palpation of tendon for nodules and adhesions
- palpate for gratey/sticky feeling of paratendon over tendon through passive dorsiflexion – passively dorsiflex foot while firmly holding tendon with other fingers and feel for a gratey pulling through of the tendon under the sheath
- check for subcutaneous blood supply – often poor despite increase in vascularisation – apply digital pressure to different areas and remove (areas of decreased blood supply will take longer to return to normal skin colour)
- Doppler ultrasound – sports physicians may check for vascularity and fibre alignment -Doppler ultrasound is able to pick up areas of increased vascularity and tell whether there is any thickening/scar tissue formation
- pain level on exercise – when, where, how long ?

### **Treatment options**

Recent research suggests the most important treatment component for AT is the inclusion of eccentric calf contractions. The myofascial unit tends to be eccentrically weak in AT. Straight and bent leg eccentric contractions have been shown to promote a mild inflammatory response *locally* to the tendon.

This mild inflammation encourages an influx of chemical cell mediators to the area allowing a healing response – something that is absent in AT. Eccentric calf contractions also strengthen the myofascial unit, allowing this portion of the musculotendinous unit to absorb more load (decreasing the load on the tendon itself).

Eccentric heel raises will therefore aggravate the condition initially with most therapists accepting a pain level of about five out ten with the notion that eventually this will decrease to no pain over about a 12 week period.

It is important to note that those patients with a thickened tendon may never return to pre injury size, however, it is possible to return to pre injury function and strength levels which is the main aim of the exercises.

Initial studies have shown the eccentric heel raises over a minimum 12 weeks to be more effective than surgery in returning to pre injury function. Interestingly those that do need the surgery option still need to go through a 12 week eccentric program anyway! Surgery may be needed by some to cut out large lesions and scarring, but for the most part, eccentric heel raises are an essential of any AT recovery.

Remove and modify any aggravating factors. For example, modify a runner's program by training on elliptical trainers, poolrun, ride etc. Gait or biomechanical analysis is important. The causative factor may simply be an overloading of the tendon due to poor running mechanics. Initially de-loading the tendon is necessary. Functional fascial taping, heel raise inserts and other devices such as orthotic inclusion may be necessary.

Soft Tissue Therapy – deep fascial work, transverse frictions, passive/active tissue tension. Aim to promote a mild inflammatory response in chronic AT cases to promote healing. NSAIDs will not work – AT is past the inflammatory stage.

Newer treatments are also proving to be successful and involve sclerosing the vascular bunches to the area. Again, whether these vascular bunches are a primary or secondary factor, once they are removed there is significant improvement in AT cases and pain free movement.

Soft Tissue Therapy has a significant role to play in longstanding Achilles Tendinopathy cases. Understanding the anatomy, causative factors and long-term treatment aims is paramount to a successful outcome. Not all cases will respond the same, however understanding the basic guidelines and treatment protocol will surely help.

If unsure at any stage refer to a sports physician for a second opinion. For further information on the

**ALFREDSON** Eccentric exercises use the pubmed search engine and type in 'achilles Tendinopathy – alfredson'.

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