

## ACHILLES TENDONITIS SYNDROME

*Achilles tendonitis* (tenonitis) is defined as inflammation of that tendon that connects the gastrocnemius muscle to the tuberosity of the calcaneus of the foot. This condition is sometimes called Achilles tenosynovitis but this is a misnomer since the Achilles tendon has no synovial sheath. A better name would probably be Achilles paratenonitis since the inflammation actually occurs in the loose connective tissue surrounding the tendon, the paratenon.

*Achilles tendonitis* is characterized by palpation tenderness, fine crepitus with motion, and relatively high skin resistance right over the site of inflammation and swelling and pain in the heel.

Trauma or stress is the usual cause of *Achilles tendonitis*. The most common cause of *Achilles tendonitis* is running or jumping. Following knee injuries, it is possibly the most common complaint among runners of all types. It is especially common among basketball players, gymnasts, and dancers (especially ballerinas). Excessive structural pronation of the forefoot may predispose the tendon to injury, but decreased calf muscle flexibility or strength increases the risk of development.

*Achilles tendonitis* generally develops when the tendon has been excessively stretched by abnormally high pressure. This may occur if:

- The knee is simultaneously extended and the calf muscles maximally contracted during the push-off stage of ambulation (as is common in sprinting or running up hill).
- The ankle is unexpectedly and involuntarily dorsiflexed (the heel drops suddenly) and the resulting stretch reflex provokes a maximal contraction from the calf muscles (slipping off a stair-step or stepping in a hole).
- The ankle is violently dorsiflexed while plantar flexed and the calf muscles are maximally contracted (landing from a jump or fall).

External sources of *Achilles tendonitis* include external blows to the tendon, and friction or impingement from shoes, tape, or strapping.

*Achilles tendonitis* is reported to occur 5.3 times more frequently in females than in males.

A DSR survey should be made to establish the presence of inflammation in and around the Achilles tendon.



**The high skin resistance pattern associated with Achilles Tendonitis**

## Treatment

*Achilles tendonitis* has responded well to eclectic treatment using ice packs, phonophoresis of non-steroidal anti-inflammatories, soft tissue manipulation. Immobilization of the ankle with splinting, casting, or taping during ambulation may be helpful.

### Application:

- If the condition is **acute**, icepack the inflamed zone. If **chronic**, electrically stimulate the inflamed zone. Place a negative electrode over the inflamed zone and a positive electrode over the gastrocnemius. Preset an electrical stimulation unit to deliver a visible rhythmic contraction, at 7 Hz. Stimulate for 10 minutes. Then, set the unit to deliver a medium frequency current, with a duty cycle of 10-seconds on and 10-seconds off, sufficient to produce a near tetanic contraction of the involved muscles. Stimulate for 10 minutes.
- In either case (acute or chronic), manipulate the tissues in and around the inflamed zone to eliminate any adhesions that may be present.
- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm<sup>2</sup>. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes.
- If the condition is acute, place a negative electrode over the gastrocnemius muscle, and a positive electrode over the soleus muscle. Set the electrical stimulation unit to deliver a visible contraction at 7 Hz. Stimulate for 20 minutes.

*The following treatment form has also been effective.*

### Variation:

- Preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.8 W/cm<sup>2</sup>. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This procedure is designed to soften the adhesions that may be present.
- Manipulate the tissues in and around the inflamed zone to eliminate any adhesions that may be present.
- Twenty minutes after the first ultrasound, preset the ultrasound unit to deliver a 1 MHz pulsed waveform, at 1.5 W/cm<sup>2</sup>. Ultrasound the inflamed zone, utilizing an effective non-steroidal anti-inflammatory as a coupling agent, for six minutes. This is performed to “cool off” the manipulated zone by effectively halting the production of prostaglandins by the stressed tissues.
- Mechanically vibrate the plantar surface of the foot, for two minutes (preferably with a foot vibrator), to further increase capillary circulation and to desensitize the involved tissues.

### Post Treatment Suggestions:

Further or continued injury may sometimes be prevented, especially if the patient is still “performing” (athletes and dancers), if an adequate *tape job* can be applied after treatment and before further activity. The tape should be applied to keep the foot in plantar flexion, the degree varying according to the activity expected. If the patient simply plans to walk, plantar flexion should be slight, but if the patient expects to dance on the ball of the foot the ankle should be taped in plantar flexion, almost at the end of range. Generally, the tape job should include double heel-locks, a basket weave, and a cover-up that leaves much of the instep over the tarsals bare to avoid tape

pinching during dorsiflexion. To test the effectiveness of the tape job the patient should stand and perform the expected activities. An effective tape job will markedly reduce previous pain.

### **Trigger Points**

The following trigger point formations may, singly or in combination, imitate or contribute to the pain accompanying *Achilles tendonitis*: Soleus and Peroneus longus.