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by Orthopedic & Sports P.T. Assoc. OSPTA
and Valley Outpatient Rehabilitation VOR

Achilles Tendonitis

INTRODUCTION Achilles tendonitis is inflammation and/or degeneration of the Achilles tendon. The Achilles tendon connects the calf muscles to the most posterior aspect of the calcaneus (heel bone). It permits plantarflexion which allows your heel to lift off the ground as you move forward during gait. You depend on your Achilles tendon every time you take a step.

A NATOMY AND FUNCTION

The Achilles tendon is the largest and strongest tendon in the body. The tendon transmits forces of the gastrocnemius/soleus muscle group from the lower leg to the foot (Fig. 1). Its vascular supply comes from the intraosseous vessels distally and intramuscular branches proximally. There is an area of avascularity 2 to 6 cm. from the calcaneal insertion that is more prone to injury and degeneration. This is a common site where the Achilles tendon ruptures.

The Achilles tendon insertion on the heel is medial to the axis of the subtalar joint, making

the gastrocnemius/soleus muscle group the most powerful supinators of the subtalar joint.

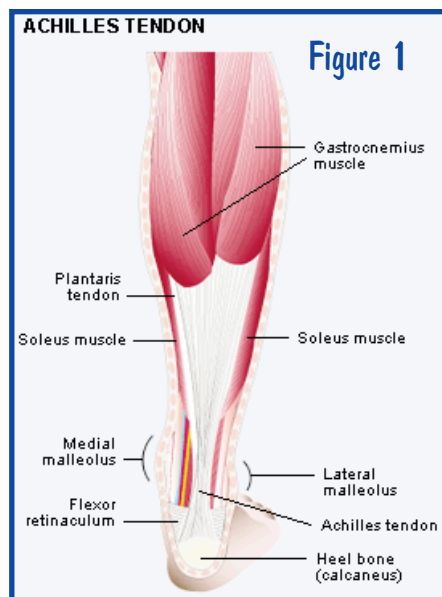
ETIOLOGY Most injuries of the Achilles tendon are 'overuse' conditions caused by excessive and/or repetitive motion associated with poor biomechanics. Achilles tendonitis can be caused by:

- overuse of the Achilles tendon,
- overly tight calf muscles,
- sudden increase in exercise (speed or running distance too soon),
- running up hill or down hill,
- doing too much after time away from exercise.

Improper footwear, improper warm up for activity, inflexibility of the calf muscles, and improper cool down are all risk factors that increase the chance of getting Achille's tendonitis.

SYMPTOMS Common complaints for Achilles tendonitis usually are described as diffuse pain in or around the back of the ankle from the calf to the heel. The symptoms are aggravated by activity, especially activities as uphill running or stairclimbing, and relieved by wearing higher-heeled shoes or boots. There may be crepitus with movements of dorsiflexion and plantarflexion, and palpation will show tender thickening of the peritendon. Other complaints are:

- swelling of the skin over the tendon associated with warmth, redness and
- tenderness,



- pain rising up onto the toes and pain with pushing off on the toes (if unable to stand on the toes, the achilles tendon may be ruptured and requires immediate attention),
- painful heel first few steps of walking after awakening,
- range of motion may be limited.

ASSESSMENT Diagnosis of Achilles tendonitis involves taking a patient history, physical examination and imaging tests. A patient history includes:

- history of prior pain or weakness in the lower leg,
- history of recreational activity,
- recent changes in activity level, footwear, or training duration of surface.

Physical examination findings should include: palpation of the lower leg for tenderness, swelling, nodules, warmth, and decrease tissue mass. Range of motion assessment, both passive and active, of the knees, ankles and feet should be performed in the prone position.

The Thompson test (Fig. 2) is performed to determine if the Achilles tendon is intact. To perform this test, the patient may kneel on examine table with feet over the edge, and the tester squeezes the back of the lower leg (calf). This should cause the foot to flex if the Achilles tendon is at least partially intact.



Imaging tests that may help diagnosis Achilles tendonitis include: x-ray, ultrasound and MRI. X-rays cannot conclusively diagnose the condition, but are used to detect soft tissue swelling, calcification in the tendon or its insertion, calcaneal calcifications, Haglund's deformity (pump bump), or

fractures. Ultrasound is most reliable in determining the thickness of the Achilles tendon and size of gap after a complete rupture. MRI can be used to detect partial tendon ruptures and degenerative tendon changes. The MRI is the best for surgical planning (location, size).

TREATMENT OPTIONS The most effective treatment is the R.I.C.E. regimen. This involves application of (R) rest, (I) ice, (C) compression, and (E) elevation. This regimen has been used immediately after an injury and has shown to reduce recovery time.

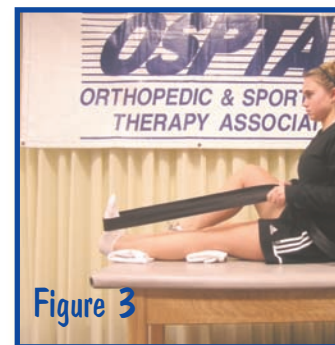
(R) Rest is important to maintain the lower leg as still as possible. This will slow down blood flow to the tendon and reduce the risk of further damage.

(I) Ice is a very important part of the regimen. This will have the greatest effect on decreasing bleeding, swelling, and pain. Ice should be applied as soon as possible. When using ice, it should not be applied directly to the skin. The most common recommendation is to apply for 20 minutes every 2 hours for the first 48 to 72 hours. The individual should make the decision how long the ice should stay on.

(C) Compression helps reduce both bleeding and swelling around the Achilles and helps to supply support to the ankle and lower leg. A large compression bandage should be used to cover the entire ankle and lower leg.

(E) Elevation of the injured leg above the level of the heart at all possible times will help decrease the bleeding and swelling.

If the injury is severe enough, it is important to consult a professional doctor or physical therapist for an accurate diagnosis and further advice. You may be prescribed anti-inflammatory medications and a rehabilitation program. Sometimes, the ankle may need to be immobilized after the injury.



A few things should be **avoided** in the first 48 to 72 hours after the injury as follows:

- heat at the injury site,(heat lamps, heat creams, spas, jacuzzi's and saunas)
- avoid movement,
- massage to the injured area, excessive alcohol.

All the above could increase the bleeding, swelling and pain of the lower leg.

Most of the swelling should decrease after the first 48 to 72 hours and one should be able to start light activity. One should **NEVER** do any activity that hurts the injured area. You should never push it to the point of feeling pain.

Some common treatments to remove unwanted scar tissue are performed in physical therapy. The most common methods are ultrasound, massage and heat. These treatments increase the blood supply to the injured area and increase the amount of oxygen and nutrients needed for recovery. To remove unwanted scar tissue, it is important to start massage to the injured tendon and muscles. You may also be advised to wear a heel pad or shoe insert that will correct the position of the foot when walking and running.

REHABILITATION Regaining flexibility, strength, power, muscular endurance, balance and coordination will be the primary role in the rehabilitation of the injury. The major points in rehab for Achilles tendonitis are to improve the elasticity of the calf muscle and increase painfree range of motion of the ankle. Exercises to help achieve this include:

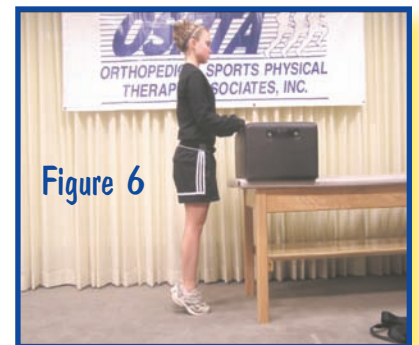
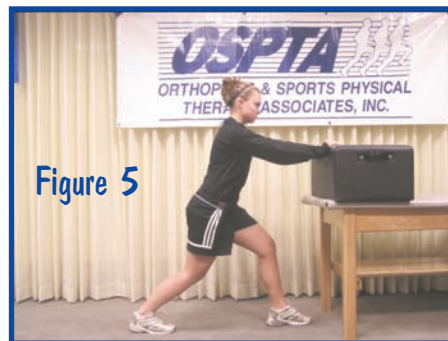
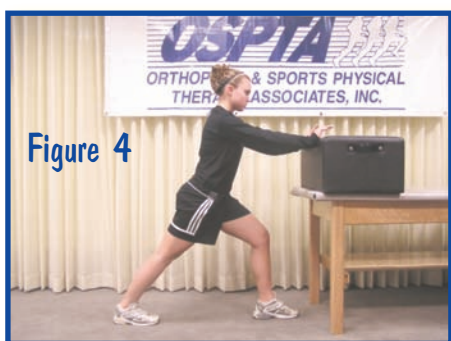
Towel calf stretch: (Fig. 3) Sit with the leg straight and loop the towel around ball of foot. Gently pull back on the towel towards the body keeping the knee straight until a stretch is felt in the calf. Hold this position for 15 to 30 seconds then relax. Repeat 3 times.

Standing calf stretch: (Fig. 4) Face the wall, put hands against the wall. Keep the injured leg straight with heel on the floor and uninjured leg forward. Turn injured foot slightly inward and slowly lean into the wall until a stretch is felt in the calf. Hold 15 to 30 seconds. Repeat 3 times.

Standing soleus stretch: (Fig. 5) Stand facing the wall with both knees slightly bent, gently lean into the wall until a stretch is felt in the lower calf. The foot should be turned inward and heel down on the floor. Hold 15 to 30 seconds. Repeat 3 times.

Heel raise: (Fig 6) Balance while standing behind a chair or counter. Raise body up onto the toes and hold, then lower down slowly. Repeat 10 times. Do 3 sets of 10.

CONCLUSION Achilles tendon injuries can be conservatively rehabilitated successfully. Proper warm up and stretching before activity are important. Increasing intensity and duration of training should be done gradually, and if pain is experienced over the tendon, the exercise should be stopped. Proper conditioning and footwear are the best prevention against Achilles tendonitis.





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NEWS *briefs*

OSPTA would like to welcome Ms. Amanda Klink, PT, Ms. Sommer Temple, PT and Ms.

Martha Patterson Avery, PT. OSPTA would like to thank Ms. Tammy Albert, PT for her contribution to the Achilles tendonitis newsletter.

For the 4rth quarter of 2006, OSPTA's patient satisfaction rating was 99%. Clinical pathways were met 65% of the time with an average of 10 visits/diagnosis. Pain was reduced by 75%, function improved by 81% for an overall improvement of 84%.

Please call any of the locations below to schedule an appointment that is convenient to you. OSPTA and VOR provide day and evening hours.

In addition, OSPTA@Home provides home health services consisting of nursing, physical therapy, occupational therapy, speech therapy.

Belle Vernon	724-929-5774
Bethel Park	412-835-2259
Brownsville	724-785-5262
California	724-938-0310
Carmichaels	724-966-2709
Carnegie	412-279-7700
Charleroi	724-483-4886
Clairton/ Jefferson Medical	412-466-8811
Connellsville	724-626-3320
Elizabeth	412-751-0040
Perryopolis	724-736-7415
Uniontown	724-439-6294
Upper St. Clair/ Mt. Lebanon	412-276-6637
Washington	724-223-1207
White Oak	412-672-2352
OSPTA@Home	724-483-4859
Valley Outpatient Rehabilitation	
Monongahela	724-258-6211
Rostraver	724-379-7130
Speers	724-489-8111