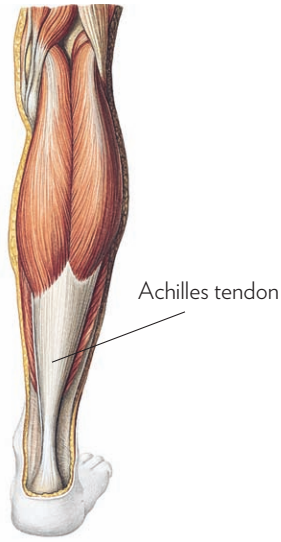
# essential skills

BY BEN E. BENJAMIN

# ACHILLES TENDON INJURIES

If you injured your Achilles tendon, it would be almost impossible for you to sneak out of your house on tiptoe—the pain would be too great. Hiking, running, dancing, or doing physical labor, like construction work, would make you equally miserable.




Sobota: *Atlas der Anatomie des Mensche* @ Elsevier GmbH, Urban & Fischer Verlag Munich

The Achilles is one of the biggest and strongest tendons in the body. It begins at the back of the calcaneus and extends up the middle of the calf. It connects the lateral and medial gastrocnemius and soleus muscles to the heel, and controls the actions of pushing off in walking, running, and rising onto the balls of the feet. Without the Achilles tendon, you literally could not walk.

## ONE TENDON, MANY TYPES OF INJURIES

The Achilles tendon can be injured in many different places, and in many different ways. The body of the tendon has four different surfaces—anterior (front), posterior (back), and medial and lateral (sides). A person can injure the tendon in any of these places—and it's possible to injure it in multiple places at once.

Most Achilles injuries are in the body of the tendon, 2–3 inches superior to the calcaneous. In addition, injury can occur where the tendon attaches to the superior posterior aspect of the calcaneus—this is sometimes referred to as dancers' heel. Injury can also occur at the aponeurosis (flat bands of fibrous connective tissue) on the medial and lateral aspects of the calcaneous. Finally, injury can occur at the musculotendinous junction where the tendon joins the gastrocnemius muscle or the soleus. (This last scenario is the least common.)

The sensation caused by an Achilles injury may range from a mild, occasional ache to a severe throbbing pain, depending on how many of the tendon fibers have been affected. When the strain is mild, there is minimal scar tissue formation, and therefore mild pain. In severe injuries, involving repeated micro-tears of the tendon fibers and extreme inflammation, the development of adhesive scar tissue causes severe, persistent pain. If the pain becomes chronic, tendinosis can develop, causing the fibers to atrophy and the pain to become more difficult to treat.

## HOW AND WHY THE TENDON GETS INJURED

Whenever you walk, run, or stand on tiptoe, the Achilles tendon is called upon to work. If your pelvis, knees, and feet are in good alignment, your weight is evenly distributed throughout the Achilles tendon as you perform these tasks. If there is a misalignment in one of these body parts, however, the majority of your weight falls onto either the medial or lateral aspect of the tendon, causing a constant strain—an injury waiting to happen.

One common alignment issue is excessive pronation of the feet, causing more weight to fall on the medial portion of the Achilles. While the medial part gets overworked, the lateral part gets underworked and therefore weakens. Another possible source of imbalance is weakness in the one of the four quadrants of the low leg. Only when the stirrup muscles, peroneus/fibularis muscles, tibialis anterior and posterior muscles, and calf muscles have balanced strength will weight be transmitted properly into the foot and therefore the tendon.

Improper stretching of the calf muscles (stretching that is too aggressive or too prolonged) can also cause an injury, as can overuse. Runners, athletes, and dancers frequently strain the Achilles tendon by jumping up and down on the balls of their feet or by just working out for many hours at a time.

## INJURY VERIFICATION

Before treating a client for an Achilles tendon injury, make sure the person has seen a physician. There may be other issues, such as gout or another underlying medical condition, causing the person's pain.

### TEST 1

To test for this injury, have the client stand barefoot and rise high onto the balls of the feet. The person may have to do this several times on both feet before the tendon feels pain or discomfort. If no pain is felt,

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Friction of the posterior surface.

Friction of the medial and lateral surfaces.

Friction of the anterior surface.

have the client repeat the test while standing on the injured leg only. If the tendon is injured, the location of the pain tells you the location of the injury, because this tendon doesn't refer pain to any other areas.

If the client feels pain only after strenuous activity, have the person perform a strenuous activity and then do the test again. If the Achilles tendon is injured, the pain will increase with the test.

### TEST 2

If the person cannot walk, it may be because the tendon is severely inflamed or ruptured. In these cases, have the client lie supine while you place the palm of your hand under the metatarsal area of the foot. Now place the client's foot in dorsiflexion and ask the person to push your hand away, bringing the foot into plantarflexion. In cases of severe strain, the person will be able to push your hand away, but will also feel some pain. If the tendon is ruptured, absolutely nothing will happen because you cannot plantarflex the foot without your Achilles tendon. When a rupture occurs, the person usually goes to a hospital immediately, so it is very rare for a massage therapist to see someone with a ruptured tendon. If you happen to see someone who cannot plantarflex the foot, run your finger gently down the tendon. Your finger will drop into a small space where the tendon used to be. This person needs to go to the hospital immediately for a surgical repair.

## TREATMENT CHOICES

### SELF-TREATMENT

It can help to wear a shoe with a moderate (1–1½ inch) heel, which takes the pressure off the tendon when walking. It's also important to avoid any activity that causes pain. Unless the strain is very mild, an Achilles injury is difficult to self-treat. If the pain comes and goes and is not resolved in a few weeks, the person should seek professional treatment.

### MYOFASCIAL THERAPY

Sometimes the fascia that covers the Achilles tendon contains scar-tissue adhesions. If this is the case, performing myofascial therapy on the tendon is the first therapeutic step, provided that you have the appropriate training.

### FRICTION THERAPY

This treatment modality is often effective in breaking up pain-causing adhesive scar tissue. With two to three friction therapy treatments a week, healing generally takes about 4–6 weeks for recent injuries, and 8–12 weeks for chronic injuries. Unfortunately, this treatment can be fairly uncomfortable for the client. To see a video clip of friction therapy on the Achilles tendon, visit the digital edition of *Massage & Bodywork* magazine (www.abmp.com).

Friction of the posterior surface. Have the client lie prone, with the injured foot hanging off the edge of the table. Stand at the foot of the table and place your hand or thigh against the sole of the foot, creating a right angle at the ankle. Maintain this position throughout the treatment. Use your thumb pad or thumb tip to friction the affected area of the back portion of the tendon.

Friction of the medial and lateral surfaces. Start from the same position you used for the posterior surface. Grasp the affected part of the tendon between your middle finger and thumb. Now, friction by drawing your hand backward, moving your fingers from the anterior toward the posterior aspect of the tendon. To friction only one surface at a time, squeeze the tendon with your thumb to perform the friction, while curling your index finger on the opposite side for support.

Friction of the anterior surface. Have the client lie prone with the foot resting on the table, fully plantarflexed. This puts the tendon in a relaxed position so you can reach the anterior portion. Sitting at the foot of the table, forcefully push the tendon sideways with the thumb or fingers of one hand, and place the index finger of your other hand on the tendon's anterior surface. Support this finger with the middle finger of the same hand. Perform friction by alternately supinating (with pressure) and pronating (without pressure) your forearm and hand. This action rotates the index finger, causing a friction movement. Throughout the movement, hold your finger, hand, and forearm in a straight line with the elbow bent. Take care not to use too much pressure; this treatment is a bit uncomfortable for the client. After you've performed the technique on one side of the anterior surface, repeat on the other side (you can only reach about half of the surface from each side).

Friction of the distal tendon.

Friction of the distal aponeurosis.

Friction of the distal tendon at the calcaneal attachment. Again, have the foot fully plantarflexed on the table so the tendon is relaxed. Place your index fingertips on the calcaneal attachment, with your thumbs under the heel. Press firmly and draw your index fingers across this area by moving your forearms from side to side.

Friction of the distal aponeurosis. Palpate the aponeurosis (the broad, sheet-like attachment) covering the calcaneus. After locating a tender area through palpation, place your thumb or index finger on that spot and apply a friction motion. When treating an aponeurosis, you can apply friction in any direction.

## STRETCHING

After two weeks of friction treatment, begin gentle stretching for both the calf and the Achilles tendon. These movements should be done only if and when they cause no pain.

Ask your client to sit on the floor with the knee bent at a 90-degree angle and the fingers wrapped around the ball of the foot. Have the person actively dorsiflex the foot as far as possible, then use the hands to pull the ball of the foot toward the shin for up to two seconds (no more), and then place the foot back on the floor. Repeat 10 times, followed by 10 repetitions of the same stretch with the foot everted, and then 10 repetitions of the stretch with the foot inverted. Next repeat all three stretches—straight, everted, and inverted—with the knee bent to a 120-degree angle; this position places more tension on the tendon than on the muscle.

These brief stretches encourage healing and help to prevent the return of adhesive scar tissue. The intention is not to stretch the Achilles, but to strengthen the structure by repeatedly placing tension on it. At first, use the stretches only during your treatment sessions. When the client clearly understands how to do them and they cause no discomfort whatsoever, have the person do them daily to encourage continued healing in a full range of motion.

## STRENGTHENING

After the acute pain has subsided and the person can walk again without discomfort, begin a strength program for the lower legs. Start with heel raises, keeping the knees straight. Have the client stand on both feet, with more weight on the good leg if it is too stressful on the injured leg to share the weight equally.

Over the course of a few weeks, have the client transfer more and more weight to the injured leg, until performing three sets of 10 heel raises with equal weight on both legs causes no pain or fatigue. Then vary the exercise, using three different foot positions: parallel, turned slightly inward, and turned slightly outward. Have the client do 10 repetitions in each position, for a total of 30.

Once the client can do these variations easily, add in bent-knee versions of the same three exercises, for a total of 60 repetitions. The final stage is to perform the three variations while standing with the balls of the feet on a step, so that the heels drop below the forefoot. This allows the Achilles tendon to move through its full range of motion while getting stronger.

## SURGERY

In cases where the tendon has completely ruptured, surgery is required.

Once your client has healed from an Achilles injury, make sure you provide one final set of instructions on how not to re-injure the tendon. The best ways to prevent re-injury are to: always warm up before any strenuous activity, make sure to reenter any athletic activity slowly, and stop if there's any pain. Also be sure that your client has well-fitting athletic shoes and plans to continue the stretching and strengthening program you've started together. **m&b**

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Editor's note: *Massage & Bodywork* is dedicated to educating readers within the scope of practice for massage therapy. Essential Skills is based on author Ben E. Benjamin's years of experience and education. The column is meant to add to readers' knowledge, not to dictate their treatment protocols.