

essential skills

BY BEN E. BENJAMIN



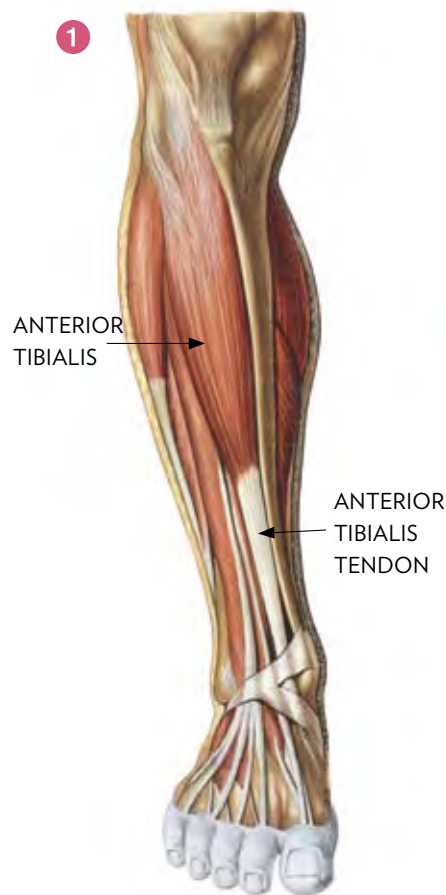
ANTERIOR TIBIALIS INJURIES

In the last issue (“Posterior Tibialis Injuries,” *Massage & Bodywork*, July/August 2009, page 92), we looked at the posterior tibialis, a muscle-tendon unit located at the posterior medial lower leg. In this article, we’ll examine its counterpart at the anterior portion of the leg: the anterior tibialis.

Contraction of this muscle-tendon unit both inverts and dorsiflexes the foot. The anterior tibialis plays a key role in walking and running, helping to control the foot’s descent to the ground as the muscle lengthens (eccentric contraction) and to lift the foot off the ground as the muscle shortens (concentric contraction).

If you dorsiflex your foot with your shoes and socks off, you can see the anterior tibialis tendon protruding at the anterior aspect of your ankle. Try tracing the tendon’s path with your finger. As you follow it distally, it crosses the center of the ankle and extends to the middle of the medial arch on the medial aspect of the foot. As you follow it proximally, it leads to its controlling muscle (Image 1).

The anterior tibialis muscle originates at the lateral condyle of the tibia and the upper portion of



Putz/Pabst: Sobotta, Atlas der Anatomie des Menschen, 21st ed. 2000 © Elsevier GmbH, Urban & Fischer München

the lateral surface of the tibia. As it progresses distally toward the foot, it attaches to various structures, including the interosseous membrane between the tibia and fibula, the deep surface of the fascia, and the intermuscular septum, ending at the anteriomedial dorsal aspect of the foot. It inserts into the medial cuneiform bone and the base of the first metatarsal bone.

When the anterior tibialis muscle-tendon unit is injured, it is painful to walk. There may also be some

puffiness at the front of the ankle or a creaking sound when the foot is moved. (The creaking sound indicates an inflammation of the thin sheath covering the tendon, a condition referred to as tenosynovitis.) This injury can easily be confused with a compression of the L4 nerve root by a protruding disc, a serious low-back injury that causes loss of control of the foot during walking (“foot drop”).

Injuries to the anterior tibialis muscle are colloquially referred to as “shin splints.” When the tendon is strained, pain may be felt anywhere from the inner arch of the foot to about four inches above the ankle. In some cases, only a small portion of the tendon is painful; in others, pain is felt throughout the entire tendon.

HOW AND WHY THESE INJURIES OCCUR

On occasion, a severe anterior tibialis injury may happen suddenly as the result of a fall, a long jump, or another event that causes extreme stress, such as running a marathon without adequate preparation. Typically, however, these injuries develop slowly, gradually worsening over a period of several weeks or months. Often, the discomfort first appears after a hard volleyball or soccer game, a long run, a rigorous hike, or another strenuous activity that causes the muscle to fatigue and excess stress to be absorbed by the tendon. While the pain is not too bothersome at first, as the weeks progress it is present more often and for longer periods of time. It seems better with rest, but gets bad again when the person is active. When the injury becomes severe, simply walking or dorsiflexing the foot causes pain. If only the muscle fibers are



injured, the pain is felt in the anterior lower leg. A tendon injury is generally experienced as a pain or ache on top of the foot, just anterior to the ankle, but may also be felt in the tendon when it crosses in front of the ankle joint.

Individuals whose feet are excessively pronated, with the arches falling in medially, are more likely to develop this injury. The anterior tibialis tendon works to hold up the arch, so when the arch pronates, it twists the tendon and places additional strain on it. Another predisposing factor is severe tension in the lower leg muscles, which makes those muscles vulnerable to early fatigue and subjects the tendon to unnecessary stress. Additional contributing factors may include ineffective warming up and running or jumping on concrete surfaces.

INJURY VERIFICATION RESISTED DORSIFLEXION

Ask the client to dorsiflex the foot by saying, “Bring your toes toward your head and hold them there.” Then, place one hand under the client’s heel for support and the other hand on the forefoot just proximal to the toes. Ask the client to hold the foot in that position and not let you move it. Apply great force, trying to pull the foot into plantar flexion (Image 2).

HEEL WALKING

From a standing position, have the client lift the balls of the feet off the floor, balancing on the heels for a moment and taking a few steps. This can be done either barefoot or in shoes, whichever is more comfortable.

One or both of these tests should reproduce or increase the person’s pain. To locate the exact area of injury, palpate various places along the tendon and muscle while the client holds the foot in dorsiflexion.



Photos by Melinda Bruno.



TREATMENT CHOICES SELF-TREATMENT

This injury often takes a long time to heal on its own because the anterior tibialis muscle-tendon unit is used to walk every day, and thus is constantly irritated. Rest usually helps over four to six weeks, but if the feet are chronically pronated, the injury is likely to recur. The person should not take long walks, hikes, or runs if those activities cause pain. If the pain is severe or persists for more than two weeks, it’s important to seek treatment.

FRICION THERAPY AND MASSAGE

Friction treatment usually gives relief rather quickly, because the tendon is easily accessible. Typically only four or five treatments are required.

Friction of the Anterior Tibialis Tendon

Sit at the base of the table facing the affected foot. While stabilizing the foot with one hand, place the tip of your thumb or index finger on one edge of the anterior tibialis tendon. Apply a posterior pressure and snap through the tendon in a medial-to-lateral direction (Image 3). Do this for a few minutes, then change positions so that you move through the tendon in the opposite direction.

After using friction therapy to break down some of the scar tissue, massage the foot, calf, and shin to enhance circulation into the tendon area.

When the injury is in the muscle rather than the tendon, healing often takes longer, because many more fibers are damaged. Instead of friction, perform cross-fiber massage (using a lubricant) on the injured structure. Together with the therapeutic exercises described on page 107, this treatment is usually effective within six to eight weeks.

ORTHOTICS

Clients with chronic anterior tibialis strain related to excessive pronation can benefit from using orthotic devices—custom molded arch supports made of leather, plastic, hard rubber, or even Styrofoam inserted into the shoe. They help to improve foot alignment so that the body’s weight is distributed evenly throughout the foot. For the best results, have the person see a sports podiatrist for custom orthotics rather than buying something at the drugstore. If the strain is rather mild, removing the pressure with the orthotic may be curative as well as preventive.

EXERCISES

Begin teaching these exercises in the second week of treatment, but only if they can be done without pain. After starting the person off

with one or two exercises, add the others in one at a time in subsequent sessions. The general principle is to start slowly, with a light weight and small number of repetitions, then build up the weight and the number of reps as the person gets stronger and the exercises begin to feel easier.

Heel Walking

Have the client try walking on his or her heels, with shoes on, for increasing periods of time. Start with 30 seconds and build up to three minutes.

Ankle Flexion

From a sitting position on a table, with legs dangling down, have the client dorsiflex the ankle so the toes come toward the knee. Ask the person to hold this position for one or two seconds, then point the foot into plantar flexion and hold that position for one or two seconds. Begin with five repetitions of flexing and pointing, and then rest and repeat 8–10 times. After a week or two, or when that becomes easy to do, tie a long, tubular sock containing a one-pound weight around the anterior forefoot, just behind the toes. Now repeat the exercise, with the action of the foot lifting this weight and then slowly lowering it. Begin with just two sets of five, eventually building up to 30 repetitions. When this becomes easy to do, add another half-pound or pound of weight.

Inner-Ankle Lift

This exercise requires the use of props—either weights that attach to the foot in some way or a small plastic shopping bag containing a one to five pound weight. To begin, have the client sit in a chair and cross the injured leg over the good leg, with either the weight apparatus or the loaded shopping bag across the front part of the foot, just behind the toes. Now instruct the client to raise the foot toward the ceiling 5–10 times,

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take a brief rest, and repeat. Don't use too much weight to start; begin with a lighter weight and gradually build up to using 5–10 pounds over the course of the treatment. The client should begin to feel tired after 5–10 repetitions. If the exercise causes pain, it means the person either is using too much weight or is not yet ready to begin exercising.

Outer-Ankle Lift

This exercise requires the same props as the Inner-Ankle Lift, but is done from a side-lying position on a couch or bed. Have the client start with the knees bent, injured ankle on top, and then extend the top leg off the edge of the couch or bed (while wearing the weight or the shopping bag). Then, have the person lift the outside of the foot toward the ceiling—10 times with the foot in plantar flexion and then another 10 with the foot in dorsiflexion. Build up slowly to three sets of 10 repetitions in both foot positions.

Heel Raises

Start with the client standing, feet parallel, holding on to something for balance. Have the person rise up onto the balls of the feet, without bending the knees, and stay there for a moment before coming down again. After five repetitions, repeat this same exercise with the knees slightly bent. Build up slowly to eight repetitions of five, for a total of 40 repetitions.

A CLEAR PATH TO HEALING

For any client with an anterior tibialis tendon strain, the most valuable service you can provide is giving an accurate assessment. Without an understanding of what's happening, it's likely that the person will continue to aggravate the injury. When the feet are excessively pronated, even walking can put significant strain on this structure. The good news is that once you've made your assessment (which is relatively easy to do), the prognosis for healing is quite good. Of the many different structures athletes injure, the anterior tibialis is one of the easiest to treat and quickest to heal. **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.