Achilles Tendonitis

Introduction

Achilles Tendonitis is common in sports participants, particularly runners, but is not unique to sports and exercise participation. The Achilles tendon is an anatomic structure that originates from the calf muscles (the gastrocnemius and soleus) and inserts on the heel bone (the calcaneus) connecting the calf muscles to the heel. The Achilles (the largest tendon in the human body) and calf muscles are extremely powerful, and of course normal calf function is crucial to standing, walking, running and jumping. During walking, the calf muscles and Achilles absorb the load of the body's weight and flex the ankle joint in order to propel us forward. When a condition of overload or overuse occurs, the Achilles tendon may become damaged, resulting in pain, swelling and stiffness, the characteristic symptoms of the condition called Achilles tendonitis. It is often said that this and other kinds of tendonitis are inflammatory (the suffix “-itis” means inflammation); however, this condition is truly one of structural damage, usually but not necessarily, on a microscopic level. Therefore, it is more accurate to refer to it as Achilles “tendinopathy” (the suffix “-pathy” means affected with disease or unhealthy).

Overuse Syndromes

There are many “overuse syndromes” which can affect different types of tissues. These types of injuries (as opposed to traumatic injuries) are caused by repetitive motion or sustained exertion of a particular body part, resulting in an accumulation of damage, often called “microtrauma”, to that body part. Achilles tendonitis is an example of overload to a tendon, which is the tissue that links muscle to bone. All tissues of the body can be affected by overuse; tendon, muscle, ligament, bone, joint, and even nerve. There are many other common overuse conditions, including tennis elbow, patellofemoral syndrome (or “runner’s knee”), shoulder impingement syndrome, carpal tunnel syndrome, and various stress fractures.

Whether or not a person gets an overuse condition depends on a variety of factors, interacting with each other in many different ways, ultimately resulting in damage to the tissue involved. Some of these factors are “intrinsic”, unique to the individual, and include such things as: the way a person is aligned or built, his or her muscular strength and flexibility, previous injuries, and even psychological profile. Other factors are “extrinsic”, or outside of the individual, and contribute to the overload, thus bringing about the injury. These extrinsic factors include such things as environmental conditions, equipment used (including shoe wear), ergonomic and postural factors, and the types of surfaces on or in which activity occurs. However, the most common extrinsic factor contributing to the development of an overuse injury is the amount and speed of the applied exertional load. How much, how soon, and how frequently the stress is applied overwhelms the tissue’s ability to adapt to the load, causing it to break down instead of getting stronger. In exercisers, particularly runners, these training errors are committed often, which is why a condition such as Achilles tendonitis is seen so frequently in our medical center.

Manifestations and Diagnosis

Achilles tendonitis is a condition of damage to the Achilles tendon, usually repetitive, cumulative, and microscopic, leading to pain, swelling, stiffness and even thickening. Occasionally, a traumatic episode such as a direct blow to the Achilles can initiate the condition. The pain is felt in the back, just above the heel (in the middle of the “cord” you can feel), or on the back
Achilles Tendonitis

of the heel itself, corresponding to the location where the Achilles tendon inserts on the heel bone. Sometimes, when the condition is mild, it only occurs after vigorous activity. With worsening, the pain can be felt during any activity and even at rest. Pain is often felt in the morning, upon arising after sleeping, and accompanied by stiffness. Achilles tendonitis is very common to runners, or those participating in running sports. However, anyone at all can get the condition, regardless of whether they are exercise participants.

In order to diagnose the condition, your practitioner will ask questions about it, and then perform an examination. In most cases, other diagnostic studies are not necessary. Imaging studies may be done; an X-ray can be useful to exclude other conditions, or in cases where the pain is mainly on the bony part of the heel. MRI findings are quite variable, ranging from normal to markedly abnormal (even in structures other than the Achilles) and has not proven to be very useful in the diagnosis or treatment of this injury. Ultrasound imaging is occasionally needed to confirm the diagnosis in a case that may not be straightforward.

Treatment

Protection from Re-injury: Activity modification is probably the mainstay of treatment for Achilles tendonitis, as well as other forms of overuse injury. The human body has a remarkable self-repair capacity; however, it is frequently not given the chance because of the demands we place on it. Rest alone usually does not resolve this, or any, overuse condition. The damaged tendon tissue has to undergo repair, involving regeneration of healthy tissue. In order to do this, the tendon has to be loaded in a gradual and controlled fashion. Thus, it will be allowed to adapt appropriately to the applied load, becoming healthy and strong again. Rather than complete rest, treatment therefore entails an “active rest”, and the speed of recovery depends mainly on factors which you can initiate and control yourself. Keep in mind, though, that it is very easy to re-injure the recovering tissue with stress applied too hastily. The idea of cross-training is very useful in the early part of treatment. You can still do exercise which does not load the Achilles tendon, such as cycling or swimming, in order to maintain fitness.

Pain Control: Pain control is of course an important component in the early recovery phase, and there are several things that can be done to get relief, as listed below.

- Ice: Apply an ice pack for about 15 minutes at a time, repeated frequently (up to 1 or 2 times every hour) for several days. Be sure to protect the skin by putting a damp wash towel between the ice bag and the skin.

- Medications: Over-the-counter pain relievers such as ibuprofen, naproxen or other NSAIDs also could be useful early on for pain relief. Recall, though, that Achilles tendonitis is really not an inflammatory condition. These “anti-inflammatory” medicines therefore play a very limited role in recovery and they do not change the course of Achilles tendonitis at all. In fact, there is evidence that continued use of NSAIDs may prolong recovery because of a disruption in the body's natural reparative mechanisms.

- Injections: We generally do not recommend cortisone injections for relief of Achilles tendonitis pain as they have not been shown to be effective and can potentially worsen the damage to the tendon to the point of causing it to tear. You may have heard of the use of some newer types of injection agents, called “sclerosing agents”. There have been some reports of their efficacy in particularly challenging cases of Achilles tendonitis; however, as of yet there are not convincing studies proving that they are safe or that they work well.
Achilles Tendonitis

- Bracing: Braces sometimes are useful both for pain control and for protection from re-injury (see discussion below). Additionally, a 1/8 or ¼ inch heel lift inserted in the rear footbed of the shoe is sometimes recommended. It works by preventing the Achilles tendon from reaching its full length during weight bearing, therefore decreasing the loading forces a bit and relieving the discomfort. Orthotic shoe devices may also be recommended by your provider for similar purposes.

Rehabilitation: The principle of rehabilitation is to allow the injured tendon to heal by exposing it to mechanical stimulation in a healthy way, allowing it to heal by adapting to the applied stress on it. There are various components of a sound rehabilitation program, as outlined below.

- Bracing: Unfortunately, with Achilles tendonitis, even walking can overload the injured tendon enough to prevent repair and recuperation. It is often necessary in more advanced cases to begin treatment with a brief period of immobilization in a device that allows controlled ankle motion.

  ![Link to picture of CAM brace](image)

After an appropriate recovery period, proper rehabilitation can usually begin. Your doctor or physical therapist can teach you rehab exercises that you can do at home. You can also use the information provided below to assist in your own rehabilitation program.

- Stretching: This is an important component of rehabilitation because the injury itself causes inflexibility and stiffness. A brace called a “night splint” which places the Achilles tendon on passive stretch has demonstrated some effectiveness in the recovery process. It is usually worn at night when sleeping but can be used while sitting for prolonged periods during the day. Your doctor can help you decide whether it would be useful for your case.

  ![Link to picture of night splint brace](image)

Active stretching is also necessary. We recommend that you stretch your Achilles tendon and calf (as demonstrated in the figures) 3 to 6 times a day, especially before and after exercise.

  ![Link to picture of towel stretch](image)

Directions: Place the rolled towel under the center of your foot, holding the towel at both ends, and gently pull the towel toward you while keeping your knee straight. Hold for 10-30 seconds. Repeat once or twice in a stretching session.

  ![Link to picture of calf stretch](image)

Directions:
1. Stand facing a wall with your hands on the wall at about eye level. Put the leg you want to stretch about a step behind your other leg.
2. Keeping your back heel on the floor, bend your front knee until you feel a stretch in the back leg.
3. Hold the stretch for 10 to 30 seconds. Repeat 1 to 2 times for each stretching session.

- Massage: Correctly applied “friction” massage can be very useful in the treatment of Achilles tendonitis. The idea is to stimulate the circulation to the healing tissue and even break up some of the scar that forms in the area of tissue damage. Although it can be a bit painful (especially if done too forcefully), it will not worsen the condition and may stimulate a more rapid healing response. Take your thumb or second and third fingers and rub across the middle of the Achilles tendon, back and forth for 30-60 seconds. If the area stays sore after this treatment, you can apply ice afterwards to settle it down. Friction massage can be repeated often; as the stiffness and pain in the tendon diminish over time, you can discontinue this part of treatment.

- Strengthening: Another important component of recovery is to gradually strengthen the injured tissue, with the application of a load in a controlled and progressive way in order to allow the tissue to adapt to strain so that it will recover its natural physical properties (remember that tendons, the connectors of muscle to bone, are designed to withstand repetitive strain, or loading.) Calf or toe raises are an especially important exercise specific to Achilles rehabilitation.

**LINK TO PICTURE OF STANDING CALF RAISES**

**Directions:**
1. Stand on a flat firm surface with your hands resting on either a hand-rail or on a wall at about chest level for balance.
2. Slowly raise and lower your body by pushing off on your toes to lift, holding briefly (one or two seconds) at the top of the lift, and then relaxing to lower. Repeat 10-15 times.
3. Over a period of weeks, gradually increase the number of sets of 15 repetitions you do in one session. When it becomes very easy, you can try adding weight by wearing a loaded backpack, or you can later do the toe raises one leg at a time.
4. For a more advanced strengthening technique, you can stand with your forefoot on the end of a step with your heel hanging down as you start the lift, then lowering it below the step with each repetition.

There are many other lower extremity exercises that can be done for Achilles tendon rehabilitation; they include such things as quadriceps strengthening, hamstring strengthening, hip, and lower back strengthening. Although not specific to the Achilles tendon, they are important (as is the cross-training mentioned previously) because the Achilles is an important link of the “kinetic chain” of lower extremity exercise activity. Your physician, therapist, and/or athletic trainer can help you decide which exercises are appropriate.

- Functional Progression: In the later stages of recovery, you will want to resume the activities that you previously had to modify in order to begin the healing process. These activities are unique to you, and therefore require you to participate in your own recovery plan. Remember that the Achilles has to “see” strain in order to adapt and recover. If you are only stretching and doing toe raising exercises, those activities are what it will adapt to. Your physician and/or therapist will help you decide when it is safe to begin the process of return to your particular lifestyle activities, whether they are exercise, sports or simply normal daily activities. Often, and especially with sports participants, athletic trainers and coaches can be very helpful in designing some “functional” recovery programs in order to get you back in condition for your activity.
Achilles Tendonitis

- Prevention: Once your condition has improved and you are able to increase your exercise and sports participation again, it is important to take proper measures to prevent recurrence.
  1. Walk gradually before running or jumping activities to warm up; follow the warm-up with a calf stretch.
  2. Cool down properly after exercise, again stretching after activity in order to relieve the tension that built up in the tissue with exercise.
  3. Increase your running distance or jumping duration gradually and add unaccustomed sprinting, jumping or hill training slowly in order to avoid overloading the Achilles tendon and causing the vicious cycle of damage instead of adaptation.
  4. Choose athletic shoes carefully. When you try a new shoe, it is better to do so at the end of the day or after exercise when your feet are larger. Wear the same type of sock that you will when you exercise in that shoe. Make sure that
  5. your heel doesn't slip; try to walk or even run a few steps in the new shoe. Finally, if you are participating in a particular activity or sport 3 or more times a week, get a shoe that is specific to that activity.

Surgery: As in all medical conditions, the possibility of failure of conservative treatment exists; fortunately, failed treatment is uncommon. In such cases, surgery can be performed for Achilles tendonitis; it usually entails removal of the damaged portion of the tendon. Success rates for this have been reported to be good, but accurate data is lacking regarding this, and surgery has a higher chance of causing other complications.

Conclusion

Like other tendinopathies, Achilles tendonitis can be challenging to treat. The recovery process is long (often as long as 6 months or more) and therefore frustrating for the patient. The tendon repair process is a slow one for a variety of reasons; that coupled with the fact that the Achilles is continually loaded during normal walking can make it seem like it will never get better. Newer treatments are always being investigated by sports medicine practitioners and research scientists. At this point, we are unable to say whether any of these will play a role in future management of the condition, but the future does hold promise for more treatment options. With adherence to the principles of protection from re-injury, and "active rest" or rehabilitation of the injured tissue, complete healing is not only possible, but expected, along with your return to an active, healthy lifestyle.