



**Philip M. Watkins, DPM**  
**Foot and Ankle Surgery**  
370 N 120th Ave.  
Holland, MI 49424  
616.396.5855

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8251 Westpark Way Ste 150  
Zeeland, MI 49464

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3509 Kelly St  
Hudsonville, MI 49426

## Achilles Tendinitis

### Anatomy:

The Achilles tendon is the largest and strongest tendon in the body. It is made up of two muscles that join together to form the Achilles tendon. These two muscles include:

- The gastrocnemius (Latin: *gaster kneme* - belly of the leg) muscle
- The soleus (Latin: *solea* - sandal) muscle

The muscle fibers of both of these tendons are attached to a thin, strong sheet-like piece of connective tissue called an aponeurosis. The aponeurosis of both muscles join together to make the Achilles tendon. The Achilles tendon inserts into the foot at the back of the heel bone (calcaneus).



### Biomechanics:

The Achilles tendon is the primary tendon pulling the front of the foot down, thus allowing for ambulation and push-off strength.

### Pathomechanics:

As with any tendinous tissue, inflammation can occur both within (tendinitis) or around (peri (around)-tendinitis) the tendon. Inflammation or damage to the tendon can also happen at different anatomic areas. The two main locations Achilles tendinitis can occur are:

- Insertional - at the insertion of the tendon on the back of the heel bone
- Non-insertional (intrasubstance) - a few inches up the leg from the back of the heel bone

Overuse or muscular imbalances can lead to strain on the fibers of the tendon, creating inflammation within or around these structures.

### Symptoms:

Patients suffering from Achilles tendinitis often complain of pain with activities that use the tendon. These include running, jumping, going up stairs, or even simply walking. If inflammation is bad enough at the heel bone, closed back shoes can cause pain when rubbing on the heel.



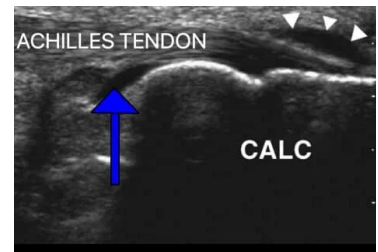
### Clinical Features:

On exam, your provider will evaluate two main areas of your tendon. The first is at the back of the heel bone. This is where the Achilles tendon inserts. Sometimes, a bump may be felt. This could be bone or inflammation of the tendon. The second area that needs to be evaluated is a few inches above the back of the heel. This is where patients can experience non-insertional pain. As with the back of the heel, a bump may be felt along the tendon, but this is almost always inflammation within the tendon because there is no bone underlying the tendon in this area



### Imaging and Testing:

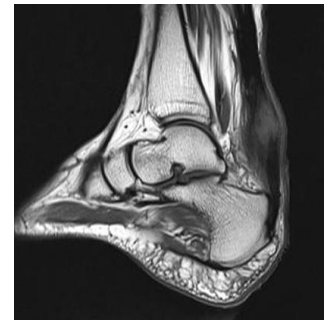
An x-ray is usually taken to help evaluate the anatomic structure of the calcaneus (heel) bone. Sometimes, a patient may have an enlarged part of their heel bone (bone “spur”) that rubs against the tendon. Additionally, a weight bearing x-ray also helps determine the overall structure of the foot and arch, as a high or low arch may contribute to the development of Achilles tendinitis. Additional advanced imaging may be considered depending on the length of symptoms, certain x-ray findings, clinical evaluation, or the response to conservative treatment. These include:



- Ultrasound
- MRI

### Conservative Treatments:

Most cases of Achilles tendinitis, both insertional and noninsertional, respond well to conservative treatment. These treatments include:



- Primary:
  - Stretching the calf and leg muscles
  - Icing
  - Wearing a heel lift to decrease pull of the tendon on the heel
  - Deep massage
  - Anti Inflammatory medicines (both oral and topical)
- Secondary
  - Surgical boot immobilization
  - PRP injections
  - Physical therapy
  - Activity modification

Depending on the length and severity of symptoms, secondary treatment modalities may be initiated on the initial visit. If done consistently, conservative measures usually lead to symptom relief within 3-6 months in 90% of people.

## **Surgical Options:**

When conservative treatments have proven ineffective at alleviating symptoms, surgical treatment options are considered. There are three main goals when considering surgical treatments of Achilles tendinitis:

- Reduce tension within the Achilles tendon (insertional and noninsertional)
- Aid in cellular repair (insertional and noninsertional)
- Reduce the pressure of the heel bone on the Achilles (insertional)

To accomplish these objectives, a number of different procedures may be considered.

- Reduce Tension in the Achilles:

- Gastrocnemius (calf muscle) recession (lengthening): When the calf muscle fires, it pulls on the Achilles Tendon. This in turn pulls on the heel bone. By lengthening the muscle in the back of the leg, the pull of the achilles tendon is not so strong on the heel. This alleviates the strain on the collagen fibers within the tendon and allows them to heal.

- Aid in Cellular Repair:

- Platelet rich plasma (PRP) injections: Your blood has many of the healing factors needed to assist in cellular healing. A small amount of blood is drawn off and spun in a centrifuge to isolate and condense the healing factors, which are then injected into the damaged or diseased portions of the tendon.

- Reduce Pressure on the Achilles Tendon:

- Haglund's resection: In order to reduce the heel bone from pressing on the Achilles tendon, the protruding bone needs to be removed. This is done through an incision on the back of the heel. Often, the tendon needs to be repaired in the process. Once removed, there is more space for the tendon to move without being pushed or squeezed by the bone.



## **Surgical Recovery:**

Surgical recovery depends on the procedure selected.

- Gastrocnemius recession: walking in a surgical boot the day of surgery.
- PRP injection: either walking in a boot or non weight bearing for 2 weeks after surgery.
- Bone spur removal: non weight bearing in a splint, cast, or boot for 6 weeks, then walking in a boot for an additional 2-4 weeks.

All surgical options for the Achilles tendon will involve physical therapy in the postoperative setting to improve strength, decrease scarring, and speed recovery.

## **Complications:**

As with any surgical procedure, complications can arise. These include: infection, pain, recurrent heel pain, numbness or tingling, scarring of skin or deeper tissue, bone regrowth, spontaneous rupture, and wound healing complications. Most complications are minor and can be treated clinically without a return to surgery.