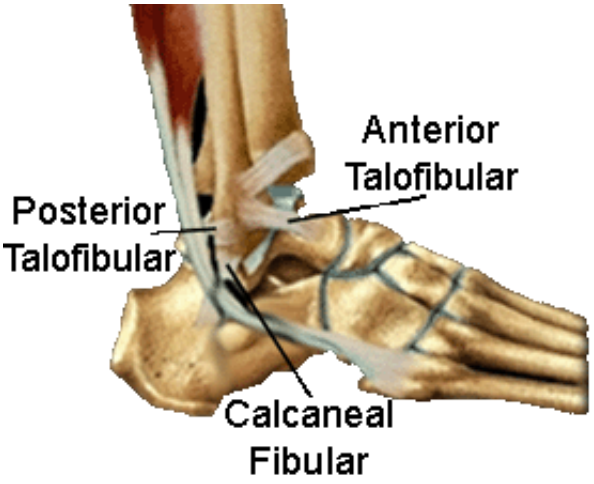
Sprains

Introduction

An ankle sprain is a common injury and usually results when the ankle is twisted, or inverted. The term sprain signifies injury to the soft tissues, usually the ligaments, of the ankle.

Anatomy

On the lateral side of the ankle there are three ligaments that make up the lateral ligament complex. These include the anterior talofibular ligament (ATF), the calcaneofibular ligament (CF) and the posterior talofibular ligament (PTF).



The very common inversion injury to the ankle usually injures the anterior talofibular ligament and the calcaneofibular ligament. The ATF ligament keeps the ankle from sliding forward and the CF ligament keeps the ankle from rolling over on its side.

Causes

A ligament is made up of multiple strands of tissue - similar to a nylon rope. A sprain results in tearing of the ligaments. The tear can be a complete tear of all the strands of the ligament or a partial tear, where a portion of the strands of the ligament are torn. The ligament is weakened by the injury - how much depends on the degree of the tear. The lateral ligaments are by far the most commonly injured ligaments in a typical inversion injury of the ankle. An inversion injury simply means that the ankle tilts over to the inside (towards the other foot), and the pressure of all your body weight is forced onto the outside edge of the foot. This causes the ligaments on the outside of the ankle to stretch - and possibly tear.

Symptoms

Initially the ankle is swollen, painful, and may turn eccyhmotic (bruised). The bruising, and the initial swelling, is due to ruptured

blood vessels from the tearing of the soft tissues. Most of the initial swelling is actually bleeding into the surrounding tissues. This initial swelling due to bleeding then increases due to edema fluid leaking into the tissues as well over the next 24 hours.

Diagnosis

The diagnosis of an ankle sprain is usually made by examination of the ankle and X-rays to make sure that there is no fracture of the ankle. If there is a complete rupture of the ligaments suspected, your doctor may order stress X-rays as well. These X-rays are taken while someone twists or stresses the ligaments.

Treatment

Treatment begins initially by:

- controlling swelling
- controlling pain
- controlling weight bearing
- Elevation will help control the swelling
- Gentle compression and ice will control swelling
- Mild pain relievers will help with the pain
- Crutches will prevent weight bearing.

Casts have fallen out of favor, and as treatment progresses, early weight bearing has been shown to be beneficial. Braces that can be worn to support the ankle - but still allow weight bearing are the most popular treatment method today. Healing of the ligaments usually takes about 6 weeks. The swelling may be present for several months. A physical therapist may be suggested to help you regain full function of your injured ankle. (See rehabilitation below)

Ankle Instability

In a small number of cases, the ligaments will not heal back as strong as normal. This results in an ankle that is unstable and has a tendency to give away, or twist again very easily. Ankle instability can lead to an ankle that is sore and painful, sometimes swollen, and untrustworthy on rough terrain. If your ankle ligaments do not heal back adequately following an ankle sprain there are several things that may be suggested by your doctor.

Once the initial pain and swelling begins to resolve, physical therapy will probably be initiated to regain as much of the normal range of motion as possible. One of the problems that tearing the ligaments around the ankle causes, is that small proprioceptive nerve endings in the ligaments are torn as well. These nerves function to give the brain information about where the body is in 3D space. For instance, these nerves are what makes it possible for

you to touch your nose with your eyes closed. The joints rely on these nerves to fine tune the muscles' actions that allow the joint to properly function. A good physical therapy program will help retrain these nerves as they repair themselves, and will strengthen certain muscles that will take over some of the functions of stabilizing the ankle joint from the loss of the ligaments.

An ankle brace may also help control some of the instability and prevent the ankle from giving way.

If all these simple measures fail, surgery may be suggested to reconstruct the ligaments that have been torn. Surgery involves making an incision on the side of the ankle. A portion of the tendon called the peroneus brevis is used to reconstruct the lateral ligaments.

A drill hole is made in the fibula, near the attachment the original ligament.

A second drill hole is made in the area where the ligaments attached to the talus.

The tendon graft is then woven these holes to recreate the ligament complex.

After surgery, you will usually be placed in a cast or brace for about 6 weeks to allow the tendon reconstruction to heal. Following removal of the cast, physical therapy will be required to regain full use of the ankle.

Rehabilitation

Whether you have had an ankle sprain that did not require surgery or whether you are recovering from surgical reconstruction of the ankle ligaments you will probably benefit from physical therapy.

In the beginning....

Treatment may vary depending on how bad of an ankle sprain you've had. In each case, the first line of treatment is to calm the inflammation and halt the swelling. The RICE (Rest, Ice, Compression, Elevation) principle can help address each of these needs.

Rest: A brace or splint will keep the ankle in a safe position, helping you avoid more strain to the sore area. In severe cases, you may require a pair of crutches to limit weight through the foot.

Ice: Cold therapy, in the form of an ice pack, can aid in slowing the inflammatory process and in limiting pain.

Compression: An elastic wrap can compress the sore area, keeping the swelling to a minimum.

Elevation: Keeping the ankle elevated above the level of your heart will help drain the extra fluid (edema) back into the blood system and reduce swelling.

As you progress....

Range of Motion Exercises: As healing gets underway, it is important to begin a series of movement exercises for range of motion (ROM). At first, you'll work on simply bending and straightening the ankle. These exercises will keep the ankle from becoming stiff.

Strength Progression: Next, you'll begin strengthening the muscles around the ankle. Isometrics may be chosen in the early stages of rehabilitation. These are strengthening exercises in which the muscles are working but the joint stays still. Isometrics allow you to exercise with the ankle at different angles, helping you stay away from painful positions of the ankle. These exercises provide the benefit of reducing overall pain and swelling. They also help the muscles remember what they're supposed to be doing.

Balance exercises: Balance exercises are especially important following an ankle ligament injury. Remember, healthy ligaments send information to the brain about the position of a joint. Once a ligament has been injured, these nerves are unable to receive and send the needed information to the brain. Balance exercises help retrain the new nerves and help you regain your proprioceptive sense around the joint.

The next part of your rehabilitation following injury will focus on strengthening the ankle even more. A set of exercises called closed kinetic chain exercises have become popular among therapists. These are exercises done with the foot fixed to the ground. They generally do not require any fancy equipment and

can be done at home. These exercises are designed to allow the muscles around the ankle to be exercised while easing stress on the ligaments. These exercises are functional - because they represent activities we do throughout the day.