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Ankle Sprain

An Ankle sprain is one of the most common musculoskeletal injuries. Patients typically describe an episode where they roll their ankle to the inside (Figure 1), which creates tearing of the ligaments on the outside aspect of the ankle. Patients typically have significant pain and swelling (Figure 2), and usually limp. However, quite often they are able to bear weight, unlike an ankle fracture where weight bearing is extremely difficult. With the ankle swollen over the outside (lateral) aspect, there is often associated redness due to the increased blood flow to this area.

Figure #1



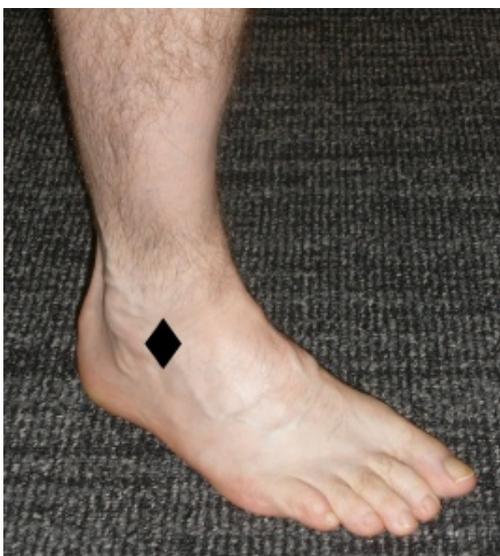
Figure #2



Physical Examination

Physical examination will reveal swelling over the outer aspect of the ankle and tenderness over the outer front aspect of the ankle (Figure 3). Unlike ankle fractures, there is usually no major tenderness over the posterior outside aspect of the ankle. Usually there is no tenderness on the inside of the ankle (medially). It is important to assess for other areas of tenderness and potential injury, as the same mechanism that creates an ankle sprain can also lead to other injuries (ex. fracture of the anterior process of the calcaneus, talar osteochondral injury).

Figure 3: Main area of Tenderness



Imaging Studies

In the emergency room, x-rays are often taken, however, they are not always indicated. In a patient with an ankle sprain, x-rays will not identify any bony abnormalities and the ankle joint will be well located. If there is no tenderness posteriorly, and the patient is able to take 4 steps, then according to the Ottawa ankle rules, the patient does not require x-rays.

Classifications

Ankle sprains are typically classified as mild, moderate, and severe. It is often difficult to tell exactly which category the ankle sprain is.

1. A mild ankle sprain involves partial tearing of the anterior talofibular ligament. This ligament is torn and may be even stretched, but it is intact. These ankle sprains will take 4-7 days to achieve most of the recovery.
2. A moderate ankle sprain involves a significant tearing of the anterior talofibular ligament and some tearing of the calcaneofibular ligament. This type of ankle sprain often takes 7-12 days to mostly recover.
3. A severe ankle sprain involves disruption of all of the ligaments on the lateral aspect of the ankle, specifically the anterior talofibular ligament, the calcaneofibular, and the posterior talofibular ligament. This is a major injury that may take 4-6 weeks, or even longer, to largely recover. Furthermore, in approximately 8-10% of patients suffering a severe ankle sprain, there will be associated injuries such as an osteochondral injury to the talar dome.

Treatment

Treatment of an ankle sprain includes:

- Rest and Activity Modification: Time is usually the best treatment for a typical ankle sprain. The body just takes time to heal the injured tissue. Staying off the injured ankle by limiting activity during the healing period is helpful.
- Ice: Ice should be applied 10 minutes on and 10-15 minutes off repeatedly. Ice helps limit the blood flow to the injured ankle. Normally, increasing the blood flow to an area is a good thing. However, after an ankle sprain, excessive local blood flow leads to too much swelling during the acute phase of the injury

- Compression: Compression helps decrease the swelling. This can be achieved with a compression wrap, such as an Ace bandage.
- Anti-inflammatory medications (NSAIDs): Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) such as ibuprofen can be very helpful to decrease pain by decreasing the inflammatory response to the injury. However, there is some evidence that suggest that anti-inflammatories may have an adverse effect on ligament healing.

Subacute Phase

Once the symptoms associated with the initial ankle sprain have started to improve, patients will benefit from exercises designed to improve their:

- Range of Motion (ex. Figure of Eight Exercises and Dorsiflexion Stretching)
- Strengthening: Particularly Eversion Strengthening
- Proprioception

Surgery is not indicated for the treatment of ankle sprains. The exception would be if there is a displaced cartilage and bone fragment in the ankle joint due to an osteochondral injury to the talus (lower bone of the ankle joint).

Patients who have recurrent ankle sprains due to ankle instability may be candidates for an ankle ligament stabilization procedure.

Figure of Eight Exercises

Imagine that the tip of your big toe is a pen, then “draw” a figure of eight with your big toe. Move slowly and repeat this motion for 30-60 seconds. Take a break, and then repeat this exercise 5-10 times for a total of 5-10 minutes per day. Don’t be discouraged if your motion is limited compared to the opposite foot. It often takes time to get this motion back. Be sure not to do anything that creates excessive discomfort.

Resisted Eversion

A stretching band is attached to a fixed object such as a doorknob, and then wrapped around the outside of the foot (Figure 1). The foot is then moved in an

outward direction against resistance. This motion is repeated 10-20 times. A total of 3-6 sets should be performed.

Proprioception Exercises

Perform a graduated program that works to improve proprioception until both the right and left sides have equal proprioceptive ability (assuming one side is uninjured). Compare to your uninjured side (do exercises on both sides until each side is equal). Consider the following guidelines:

1. Do exercises daily
2. Do exercises for 30 seconds and repeat for 5-10 repetitions
3. Gradually progress the complexity of the exercises:

Basic Exercise

- Stand on one foot on a flat surface with your eyes open (30 seconds)

Higher difficulty

- Stand on one foot on a flat surface with your eyes closed (30 seconds). Have something available to grab if you lose your balance.

Even higher difficulty

- Stand on one foot on a flat surface with your eyes closed and move your head from side to side (30 seconds). Have something available to grab if you lose your balance.

Highest difficulty

- Stand on one foot on a soft surface (ex. a pillow or bed) with your eyes closed, and move your head from side to side (30 seconds). Have something available to grab if you lose your balance.