

Ankle Fractures

"I broke my ankle." A broken ankle is also known as an ankle "fracture." This means that one or more of the bones that make up the ankle joint are separated into pieces. There may be ligaments damaged as well.

Simply put, the more bones that are broken, the more unstable the ankle becomes.

A fractured ankle can range from a simple break in one bone, which may not stop you from walking, to several fractures, which forces your ankle out of place and may require that you not put weight on it for three months.

Cause

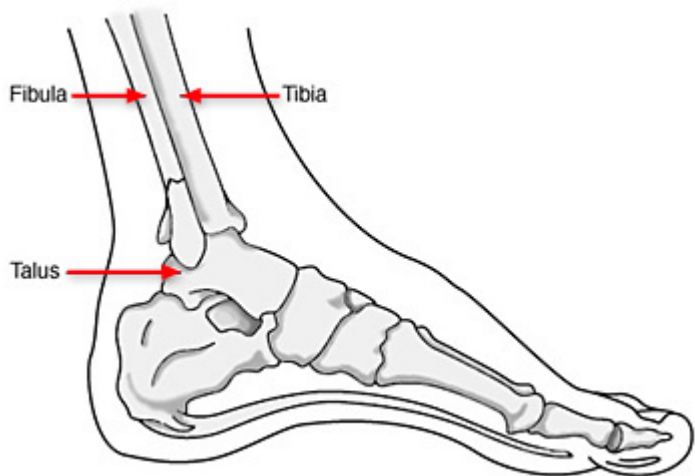
- "Twisting" or rotating your ankle
- "Rolled" your ankle
- Tripping or falling
- Impact during a car accident

Since there is such a wide range of injuries, there is also a wide range of how people heal after their injury.

Broken ankles affect all ages. Ankle fractures occur in 184 per 100,000 persons per year. During the past 30 to 40 years, doctors have noted an increase in the number and severity of broken ankles, due in part to an active, older population of "baby boomers." In 2003, nearly 1.2 million people visited emergency rooms because of ankle problems.

Anatomy

- Three bones make up the ankle joint
 - Tibia ("shin bone")
 - Fibula (small bone on the outside of your ankle)
 - Talus (a foot bone)
- The tibia and fibula have specific parts that make up the ankle:
 - Medial malleolus: Inside part of the tibia
 - Posterior malleolus: Back part of the tibia
 - Lateral malleolus: End of the fibula
- Two joints are involved in ankle fractures:
 - Ankle joint
 - Syndesmosis: The joint between the tibia and fibula, which is held together by ligaments
- Multiple ligaments help make the ankle joint stable



Symptoms

Because a severe ankle sprain can feel the same as a broken ankle, every ankle injury should be evaluated by a physician.

Common complaints for a broken ankle include:

- Immediate and severe pain
- Swelling
- Bruising
- Tender to touch
- Cannot put any weight on the injured foot
- Deformity ("out of place"), particularly if the ankle joint is dislocated as well

Diagnosis

Besides a physical exam, X-rays are the most common way to evaluate an injured ankle. X-rays may be taken of the leg, ankle, and foot to make sure nothing else is injured.

Depending on the type of ankle fracture, the doctor may put pressure on the ankle and take a special X-ray, called a "stress test." This X-ray is done to see if certain ankle fractures require surgery.

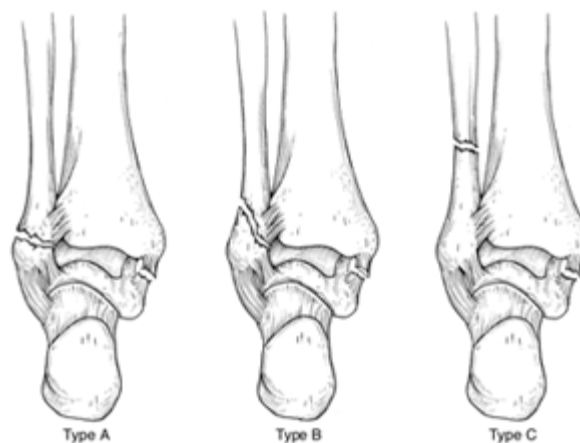
Sometimes, a computed tomography (CT, or CAT) scan is done to further evaluate ankle injuries.

For some ankle fractures, magnetic resonance imaging (MRI) may be done to evaluate the ankle ligaments.

Treatment: Lateral Malleolus Fracture

The lateral malleolus fracture is a fracture of the fibula.

There are different levels at which that the fibula can be fractured. The level of the fracture may direct the treatment.



Different levels of lateral malleolus fractures

Michelson JD: Ankle Fractures Resulting From Rotational Injuries J Am Acad Ortho Surg 2003;11:403-412.

Nonsurgical Treatment

If the fracture is not out of place or just barely out of place and the ankle is stable, you may not need surgery. Some physicians let patients put weight on their leg right away, while others have them wait for 6 weeks.

Several different methods are used for protecting the fracture, ranging from a high-top tennis shoe to a short leg cast. Treatment may also be based on where the bone is broken.

A "stress" X-ray may be done to see if the ankle is stable. You will have to see your physician regularly to repeat your ankle X-rays to make sure the fragments of your fracture have not moved out of alignment during the healing process.

Surgical Treatment

If the fracture is out of place or your ankle is unstable, your fracture may be treated with surgery. To make your ankle stable, a plate and screws on the side of the bone or a screw or rod inside the bone may be used to re-align the bone fragments and keep them together as they heal.

Treatment: Medial Malleolus Fracture

Fractures can occur at different levels of the medial malleolus.

Medial malleolar fractures are sometimes isolated but often occur with a fracture of the fibula, posterior malleolus, or an injury to the ankle ligaments, as well.

Nonsurgical Treatment

If the fracture is not out of place or is a very low fracture with very small pieces, it can be treated without surgery.

A stress X-ray may be done to see if the fracture and ankle are stable.

The fracture may be treated with a short leg cast or a removable brace. Usually, you need to avoid putting weight on your leg for approximately 6 weeks.

You will need to see your physician regularly for repeat X-rays to make sure the fracture does not change in position.

Surgical Treatment



X-ray of medial malleolus fracture/Surgical repair of a medial malleolus fracture

If the fracture is out of place or the ankle is "unstable," surgery may be offered.

Occasionally, surgery may be considered even if the fracture is not out of place. This is done to decrease the risk of the fracture not healing (nonunion), and to allow you to start moving the ankle earlier.

Sometimes, the fracture can include "impaction," or indenting of the ankle joint. This can require bone grafting to repair it, in order to lower any later risk of developing arthritis.

Different techniques for surgery can be used. Screws, a plate and screws, or different wiring techniques can all be used, depending on the fracture.

Treatment: Posterior Malleolus Fracture

A posterior malleolus fracture is a fracture of the back of the "shin bone" at the level of the ankle joint.

This is usually not an isolated injury. Often, the lateral malleolus is also fractured because it shares ligament attachments with the posterior malleolus. There can also be a fracture of the medial malleolus.

Depending on how large the broken piece is, the back of the ankle may be unstable. Some studies have shown that if the piece is bigger than 25% of the ankle joint, the ankle becomes unstable and should be treated with surgery.

A fracture of the posterior malleolus is important to diagnose because the piece is covered by cartilage. Cartilage is the smooth surface that lines the joint. If the broken piece is larger than about 25% of your ankle and is out of place more than a couple of millimeters, the cartilage surface will not heal properly and the surface of the joint will not be smooth. This uneven surface typically leads to increased and uneven pressure on the joint surface, which leads to cartilage damage and the development of arthritis.

Nonsurgical Treatment

If the fracture is not out place and the ankle is stable, it can be treated without surgery.

Treatment may be with a short leg cast or a removable brace. Patients are typically advised not to put any weight on the ankle for 6 weeks.

Surgical Treatment

If the fracture is out of place or if the ankle is unstable, surgery may be offered.

Different surgical options are available for treating posterior malleolar fractures. One option is to have screws placed from the front of the ankle to the back, or vice versa. Another option is to have a plate and screws placed along the back of the shin bone.

Treatment: Bimalleolar Fractures or Bimalleolar Equivalent Fractures

"Bi" means two. "Bimalleolar" means that two of the three parts or "malleoli" of the ankle are broken.

A bimalleolar fracture most commonly means that the lateral malleolus and the medial malleolus are broken and the ankle is not stable.

A bimalleolar equivalent fracture means that the ligaments on the inside, or "medial," side of the ankle are injured along with one of the other "malleoli." Malleoli is plural for malleolus. Usually, this means that the fibula is broken along with injury to the medial ligaments, making the ankle unstable.

A "stress test" X-ray may be done to see whether the medial ligaments are injured.

Bimalleolar fractures or bimalleolar equivalent fractures are unstable fractures and can be associated with a dislocation.



X-ray of bimalleolar ankle fracture/Surgical repair bimalleolar ankle fracture

Nonsurgical Treatment

These injuries are considered unstable and surgery is usually recommended.

Nonsurgical treatment might be considered if you have significant health problems, where the risk of surgery may be too great, or if you usually do not walk.

A splint is usually used until the swelling goes down. A short leg cast is then typically used. Casts may be changed frequently as the swelling subsides in the ankle.

You will need to see your physician regularly to repeat your X-rays to make sure your ankle remains stable.

Typically, weightbearing will not be allowed on your ankle for 6 weeks. After 6 weeks, the ankle may be protected by a removable brace as it continues to heal.

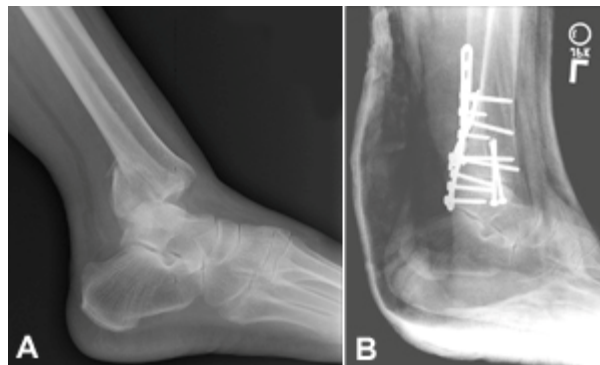
Surgical Treatment

Usually, surgical treatment is recommended because these fractures make the ankle unstable.

Lateral and medial malleolus fractures are treated with the same surgical techniques as written above for each fracture listed.

Treatment: Trimalleolar Fractures

"Tri" means three. Trimalleolar fractures means that all three malleoli of the ankle are broken. These are unstable injuries and they can be associated with a dislocation.



X-ray of trimalleolar ankle fracture and surgical repair

Nonsurgical Treatment

These injuries are considered unstable and surgery is usually recommended.

As with bimalleolar ankle fractures, nonsurgical treatment might be considered if you have significant health problems, where the risk of surgery may be too great, or if you usually do not walk.

Nonsurgical treatment is similar to bimalleolar fractures, as listed above.

Surgical Treatment

Each fracture can be treated with the same surgical techniques as written above for each individual fracture.

Treatment: Syndesmotic Injury



X-ray of syndesmotic injury and repair

These are also known as "high" ankle sprains when there is no fracture. Depending on how unstable the ankle is without a fracture, these injuries can be treated without surgery. However, these sprains take longer to heal than the normal ankle sprain.

When there are fractures of other bones in the ankle, these are unstable injuries. They do very poorly without surgical treatment.

Certain types of bimalleolar ankle fractures have an associated syndesmotic injury. Your physician may do a "stress test" X-ray to see whether the syndesmosis is injured.

Outcome

It takes at least six weeks for the broken bones to heal. It may take longer for the involved ligaments and tendons to heal.

While the bones are healing, your physician will probably schedule additional X-rays to see whether the bones are healing and to make sure that there is no movement of the bones. This is typically done more often during the first six weeks if surgery is not chosen.

Although most people return to normal daily activities, except for sports, within 3 to 4 months, studies have shown that people can still be recovering up to 2 years after their ankle fractures. It may take several months for you to stop limping while you walk, and before you can return to sports at your previous competitive level. Most people return to driving within 9 to 12 weeks from the time they were injured.

Rehabilitation

Rehabilitation is very important regardless of how an ankle fracture is treated.

When your physician allows you to start moving your ankle, physical therapy and home exercise programs are very important. Doing your exercises regularly is key.

Eventually, you will also start doing strengthening exercises. It may take several months for the muscles around your ankle to get strong enough for you to walk without a limp and to return to your regular activities.

Again, exercises only make a difference if you actually do them.

Weightbearing

Your specific fracture determines when you can start putting weight on your ankle. Your physician will allow you to start putting weight on your ankle when he or she feels your injury is stable enough to do so.

It is very important to not put weight on your ankle until your physician says you can. If you put weight on the injured ankle too early, the fracture fragments may move or your surgery may fail and you may have to start over.

Supports

It is very common to have several different kinds of things to wear on the injured ankle, depending on the injury.

Initially, most ankle fractures are placed in a splint to protect your ankle and allow for the swelling to go down. After that, you may be put into a cast or removable brace.

Even after the fracture has healed, your physician may recommend wearing an ankle brace for several months while you are doing sporting activities.

Complications

People who smoke, have diabetes, or are elderly are at a higher risk for complications after surgery, including problems with wound healing. This is because it may take longer for their bones to heal.

Nonsurgical Treatment

Without surgery, there is a risk that the fracture will move out of place before it heals. This is why it is important to follow up with your physician as scheduled.

If the fracture fragments do move out of place and the bones heal in that position, it is called a "malunion." Treatment for this is determined by how far out of place the bones are and how the stability of the ankle joint is affected.

If a malunion does occur or if your ankle becomes unstable after it heals, this can eventually lead to arthritis in your ankle.

Surgical Treatment

General surgical risks include:

- Infection
- Bleeding
- Pain
- Blood clots in your leg
- Damage to blood vessels, tendons, or nerves

Risks from the surgical treatment of ankle fractures include

- Difficulty with bone healing
- Arthritis
- Pain from the plates and screws that are used to fix fracture. Some patients choose to have them removed several months after their fracture heals

What to Discuss With Your Orthopaedic Surgeon:

1. When will I be able to start putting weight on my leg?
2. How long will I be off of work?
3. Do I have any specific risks for not doing well?
4. If I have to have surgery, what are the risks?
5. Do I have weak bone?

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