A Patient's Guide to
Ankle Fusion

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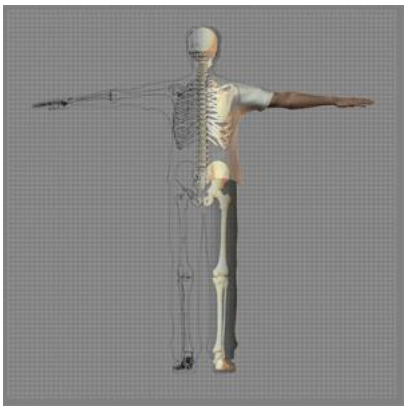

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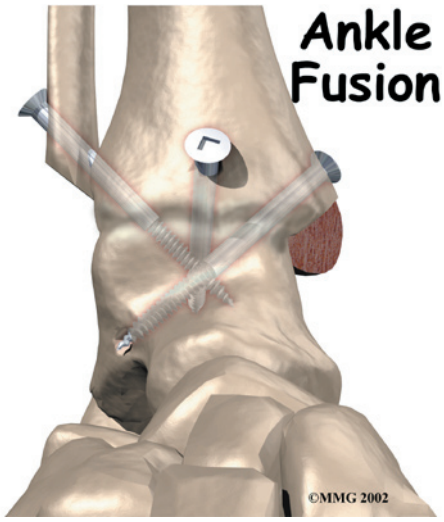


Introduction

An ankle fusion is a surgical procedure that is usually done when an ankle joint becomes worn out and painful, a condition called *degerative arthritis*. Ankle fusion is sometimes called ankle *arthrodesis*.

Probably the most common cause of degenerative arthritis of the ankle is an ankle fracture. Many years after a serious fracture, the joint may wear out and become painful. Just as an out-of-balance piece of machinery wears out faster, a joint that is out of balance after it heals from a fracture can wear out faster than normal. This process may take many years. Other types of arthritis can lead to a painful ankle joint as well. For example, rheumatoid arthritis can destroy the ankle, leading to a painful joint.

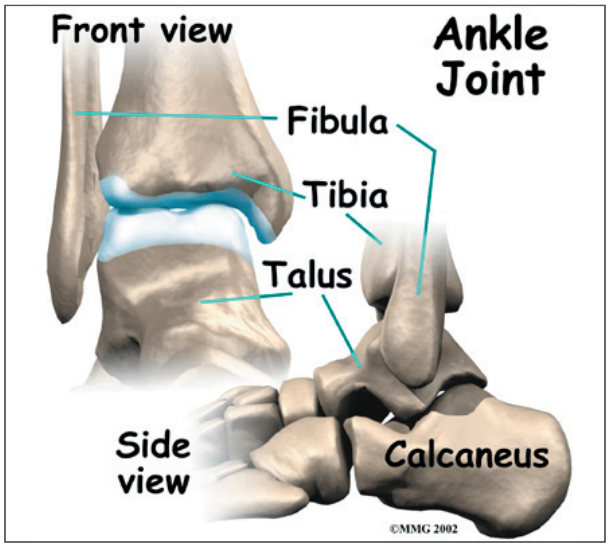
This guide will help you understand

- **why an ankle fusion becomes necessary**
- **what happens during surgery**
- **what to expect during your recovery**

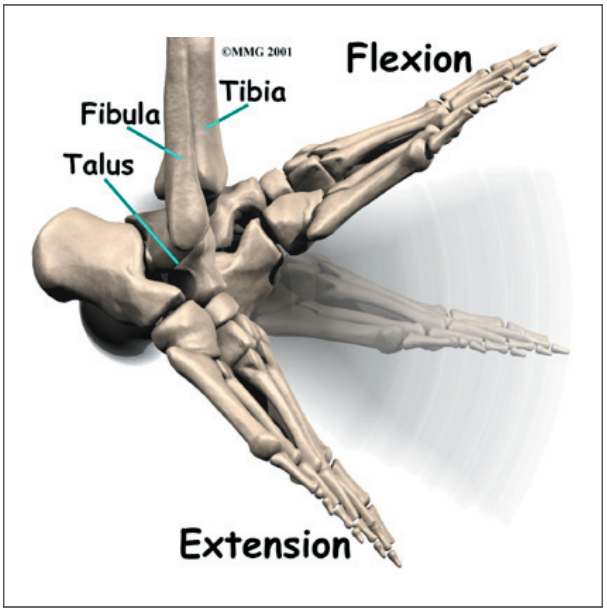
Anatomy

How does the ankle joint work?

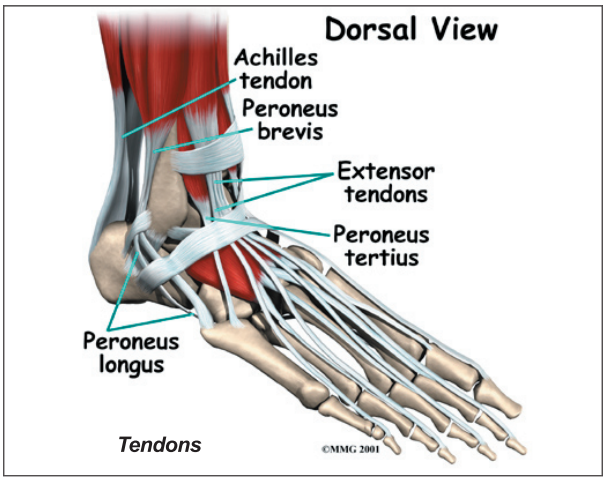
The ankle joint is made up of three bones: the lower end of the *tibia* (shinbone), the *fibula* (the small bone of the lower leg), and the *talus* (the bone that fits into the socket formed by the tibia and fibula). The talus sits on top of the *calcaneus* (the heelbone).



The talus moves mainly in one direction. It works like a hinge to allow your **foot to move up and down**.



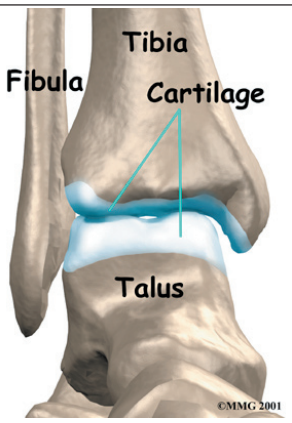
Ligaments on both sides of the ankle joint help hold the bones together. Many *tendons* cross the ankle to move the ankle and the toes. (Ligaments connect bone to bone, while tendons connect muscle to bone.)



Tendons

The large *Achilles tendon* at the back of the ankle is the most powerful tendon in the foot. It connects the calf muscles to the heel bone and gives the foot the power for walking, running, and jumping.

Inside the joint, the bones are covered with a slick material called ***articular cartilage***. Articular cartilage is the material that allows the bones to move smoothly against one another in the joints of the body.



Articular cartilage

The cartilage lining is about one-quarter of an inch thick in most joints that carry body weight, such as the ankle, hip, or knee. It is soft enough to allow for shock absorption but tough enough to last a lifetime, as long as it is not injured.

Rationale

What does the surgeon hope to accomplish?

An ankle fusion actually removes the surfaces of the ankle joint and allows the tibia to grow together, or fuse, with the talus. There are operations for many joints in the body that surgically fuse the joint to control pain. Before the development of artificial joints this was the primary operation available to treat an extremely painful joint. In some cases, fusion is still the best choice.

For the ankle, a fusion is a very good operation for treating a worn-out joint. This is especially true if the patient is young and very active. An ankle fusion, if successful, is not in danger of wearing out like an artificial ankle. An ankle fusion should last the patient a lifetime. But it is also important that the other foot joints are normal. A fusion keeps the ankle joint from moving during walking and other activities, so the other foot joints will need good mobility.

Preparation

What do I need to do before surgery?

The decision to proceed with surgery must be made jointly by you and your surgeon. You need to understand as much about the procedure as possible. If you have concerns or questions, you should talk to your surgeon.

Once you decide on surgery, you need to take several steps. Your surgeon may suggest a complete physical examination by your regular doctor. This exam helps ensure that you are in the best possible condition to undergo the operation.

On the day of your surgery, you will probably be admitted to the hospital early in the morning. You shouldn't eat or drink anything after midnight the night before. The amount of time patients spend in the hospital varies. You will need to stay until your medical condition has stabilized and you can safely use crutches or a walker.

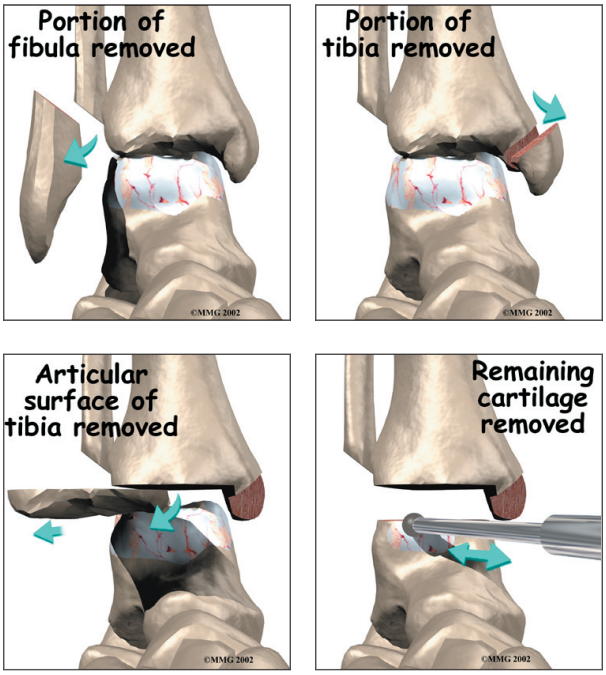
Surgical Procedure

What happens during surgery?

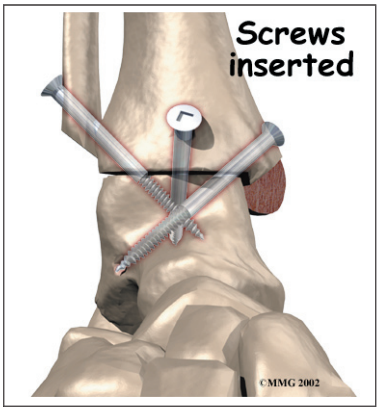
Open Method

Several different operations have been developed to perform an ankle fusion. The basic procedure in each operation remains the same,

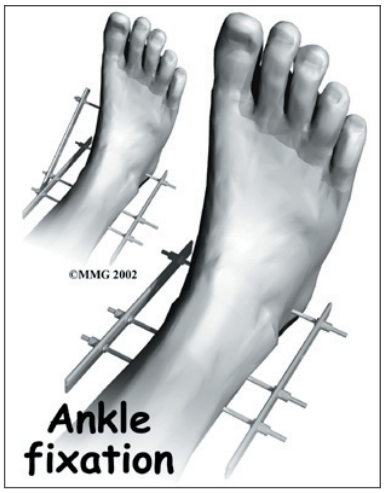
however. The most common way that an ankle fusion is done is by making an incision through the skin to open the joint. Once the joint is opened, the surgeon uses a surgical saw to remove the articular surfaces of the ankle joint. Once the articular cartilage is removed on both sides of the joint, the body will try to heal the two surfaces together just as if it were fractured or broken.

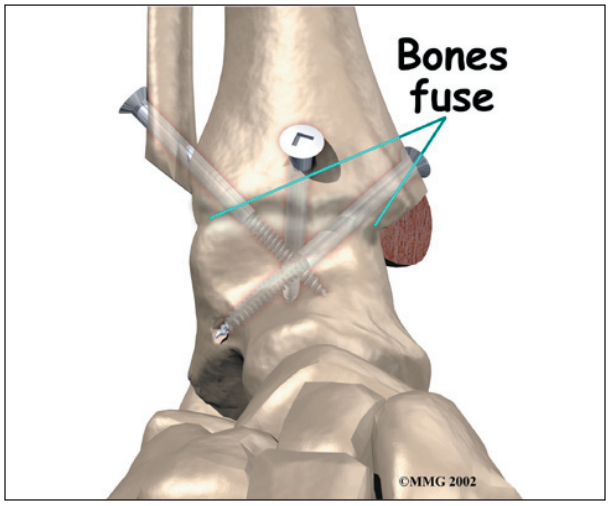


It is important when the surfaces are removed that the angles of the cut surfaces are correct. When the tibia is brought against the talus, the foot should be at a right angle to the lower leg. Once the cuts are made the bones must be held in place while they fuse. This can be done using large metal screws and metal plates if necessary. The screws are usually under the skin and are not removed unless they begin to rub and cause pain.



In some cases, especially if the fusion is being done because of an infection or a failed initial fusion, an apparatus called an ***external fixator*** is used to hold the bones together while they heal. This apparatus has metal pins that are inserted through the skin and into the bone. The metal pins are connected to metal rods and bolts outside the skin that hold the bones in position while the ankle fuses. The fixator is removed after the bones have healed, usually in 12 to 15 weeks.

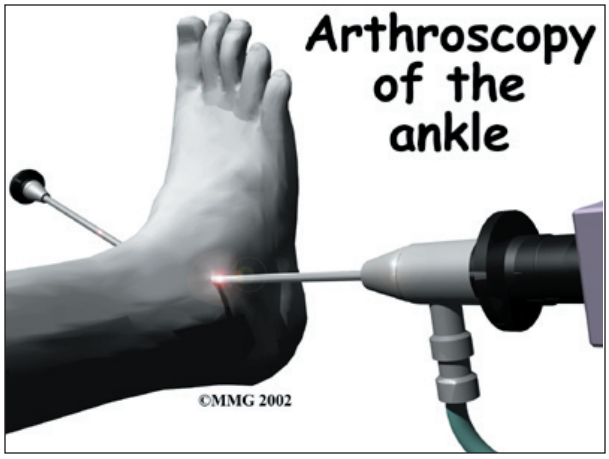




Arthroscopic Method

Some surgeons have performed ankle fusions with the help of the *arthroscope*. The arthroscope is a miniature TV camera that is inserted into the ankle joint through a small incision.

Using the arthroscope to watch, other instruments are inserted into the ankle joint to remove the cartilage surface. The cartilage surface is removed using a small rotary cutting tool. Once the surfaces are prepared, screws are placed through small incisions in the



skin to hold the bones together as they heal, or fuse. This procedure is not significantly different from the open procedure except that the incisions are smaller.

Complications

What might go wrong?

As with all major surgical procedures, complications can occur. This document doesn't provide a complete list of the possible complications, but it does highlight some of the most common problems. Some of the most common complications following ankle fusion are

- anesthesia
- nerve or blood vessel injury
- infection
- nonunion of the bones
- malunion of the bones

Anesthesia

Problems can arise when the anesthesia given during surgery causes a reaction with other drugs the patient is taking. In rare cases, a patient may have problems with the anesthesia itself. In addition, anesthesia can affect lung function because the lungs don't expand as well while a person is under anesthesia. Be sure to discuss the risks and your concerns with your anesthesiologist.

Nerve or Blood Vessel Injury

During surgery, it is possible that either the nerves of the foot or the blood vessels around the ankle can be injured. This may result in numbness in the foot if the nerves are injured. Severe injuries of the blood vessels of the foot could lead to the need for an amputation.

Infection

Following surgery, it is possible that the surgical incision can become infected. This will require antibiotics and possibly another surgical procedure to drain the infection.

Nonunion

Sometimes the bones do not fuse as planned. This is called a *nonunion*, or *pseudarthrosis*. (The term *pseudarthrosis* means false joint.) This condition requires another operation to add bone graft and perhaps additional fixation. The bones need to be completely immobilized to fuse, so an external fixator may be needed to help hold the bones in position as they heal.

Malunion

Another possible complication is that the bones may heal in the wrong position. This is called a *malunion*. If the malunion is too extreme and causes problems with walking, another operation may be required to try to achieve a better position of healing.

After Surgery

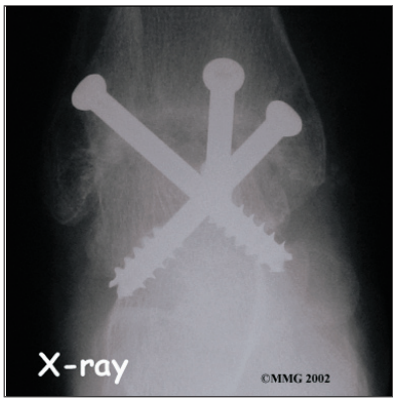
What happens after surgery?

After surgery, your ankle will be wrapped in a padded plaster cast. This will be removed after two weeks and replaced with a short-leg cast. You will not be permitted to put weight down on your foot until it is certain the bones are fusing. This usually takes between eight and 12 weeks.

You should keep your leg elevated above the level of your heart for several days to avoid swelling and throbbing. Keep it propped up on a stack of pillows when sleeping or sitting up.

Rehabilitation

What will my recovery be like?



An ankle brace will replace the cast after eight to 12 weeks. Your surgeon will take X-rays frequently to see if the bones are fusing together. You will probably need to use crutches for most of the time you wear the cast. As the fusion grows stronger, you will begin to put more weight on your foot when walking. You may need the help of a physical therapist to learn to walk smoothly and without a limp.

Once the fusion has completely healed, you will be fitted with several special shoe modifications to make walking easier. An insert in the shoe called a *SACH foot* is sometime useful to help you walk more normally. This heel cushion compresses as you put your weight on the foot and allows the foot to roll more normally as you step. Another useful modification of the shoe is a *rocker sole*. Unlike a typical flat shoe sole, the rocker sole is rounded, allowing your foot to roll as you move through a step.

While you won't be able to run normally after an ankle fusion, a successful operation should result in a nearly natural walking gait.

Notes