Ankle Fractures



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Table of Contents

Introduction……..3
Common Terms……...3
The Ankle Joint……3
Ankle Sprain vs Ankle Fracture……..…….3
Symptoms of an Ankle Sprain……..……..…4
Symptoms of an Ankle Fracture……..…4
Treatment: Ankle Fracture……...……..……..…..…4
Nonsurgical Treatment of an Ankle Fracture…….……..…..…4
Indications for Surgery……..…...……...4
Surgical Treatment of a Distal Fibula Fracture…….…...……..4
Preparing Yourself and Your Home before Surgery……...5
What to Bring to the Hospital……..…...……6
Your Hospital or Surgery Center Stay……..…...……..….6
Morning of Surgery……..…...……...…7
Going to Surgery……..…...……...……7
Anesthesia……..…...……..……...……7
The Surgery……..……..…...……..……...……8
Risks Associated with Surgery.……..…...……..……....8
What to Expect After Surgery……..…...……..……..8
First Post-Operational Visit……..…...……..……..9
Second Post-Operational Visit……..…...……..…..…..9
Third Post-Operational Visit……..…...……..……....9
Discharge Instructions for Ankle Fractures……..……10
Physical Therapy……11
Future Fracture Prevention……12
When to Contact Your Surgeon……12
Future Fracture Prevention……12
FAQ……12
About Your Surgeon……..……....14
Notes……..15

Introduction

One of the most common orthopedic injuries in the ankle is the distal fibula fracture. Ankle fractures usually occur from an injury where foot rolls underneath the ankle or leg. Sometimes this happens and bones are broken and other times only ligaments are hurt. When only ligaments are hurt it is called an ankle sprain.

This booklet will help provide a general guide to ankle fractures; information on ankle sprains versus ankle fractures; treatment methods; and an overview of what to expect before, during, and after surgery if required. Each patient heals differently, so the process may vary depending on the case.

The members of the healthcare team such as the administrators, nursing staff, physician assistants, and physicians are available to answer your questions or concerns.

Common Terms

Distal: end of the bone furthest from the heart
Talus: bottom bone in ankle joint
Tibia: shinbone and inside ankle bone
Fibula: bone on the outside of ankle
Lateral: on the outside
Medial: nearer the heart, opposite of lateral
Anterior: the front of the body
Posterior: the back of the body

The Ankle Joint

Joints are locations where bones connect and movement occurs. The ankle joint is a complex joint. It is like a rotating hinge joint. The ankle joint is formed by three bones that include the talus, tibia, and fibula. This joint is held together by many ligaments.



Figure 1: Bones of the ankle

Ankle Sprain vs Ankle Fracture

An ankle sprain refers to the injury of ankle ligaments. In most cases, it occurs on the outside side of the ankle, but can make the inside hurt too. Ankle sprains are very common injuries that affect a wide range of people. Surgery is not needed in the vast majority of ankle sprains.

An ankle fracture is a partial or complete break in a bone. This injury could include the distal end of the tibia, fibula, or both bones. Whether or not the patient needs surgery will mostly depend on the appearance of the ankle joint on an x-ray and the type of fracture.

Symptoms of an Ankle Sprain

Patients report pain on the inside or outside of the ankle. There may also be swelling and bruising. Depending on the severity of the injury, the patient may or may not be able to put weight on the foot.

Symptoms of an Ankle Fracture

A patient may experience a wide range of symptoms associated with ankle fractures, similar to ankle sprains. Patients with ankle fractures report pain at the site of the fracture, swelling, bruising, and decreased ability to walk.

Treatment: Ankle Fracture

The fibula and/or tibia can be fractured in different places. The place of the fracture affects treatment. Stress x-rays are commonly taken to assess the fracture further.

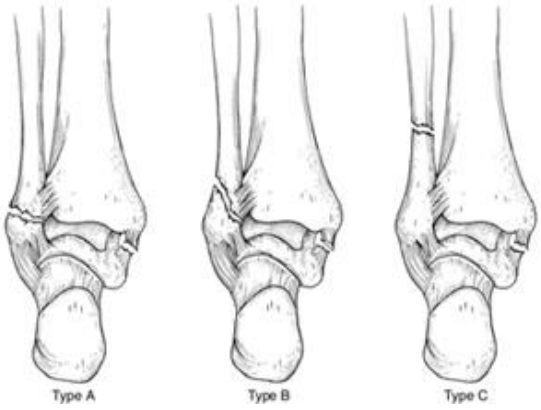


Figure 2: Different locations of distal fibula fracture

Nonsurgical Treatment of an Ankle Fracture

An ankle fracture may not require surgery if the ankle is stable. A stable ankle fracture means that the broken bone is just barely out of place or not out of place at all and the bones are in good alignment.

A variety of methods are used to protect an ankle fracture for healing. These include soft air casts, short leg casts, boots, and high top tennis shoes. Some physicians allow their patients to walk on the ankle right away while others have to wait for six weeks. A patient will need to attend several follow up appointments to repeat ankle x-rays. The physician needs to make sure the bone has not moved and is healing appropriately.

Indications for Surgery

Injuries that result in unstable ankle fractures require surgery. An unstable ankle fracture refers to bones that are out of ailment. The physician will assess the severity of the ankle fracture using x-rays and a physical examination. Health history will be taken into consideration to evaluate if surgery is the best option.

Surgical Treatment of an Ankle Fracture

In the case that the fracture is unstable, the injury can be treated with surgery. During this procedure, bone fragments are repositioned into normal alignment. The ankle bones are held together with different screws and usually metal

plates. This procedure is usually called an open reduction and internal fixation or ORIF.

Open reduction internal fixation (ORIF) refers to a surgical procedure that treats an ankle fracture and many other fractures. Open reduction means that surgery is needed to realign the bone fracture into its normal position. Internal fixation refers to the plates and screws used to keep the bones aligned in order to allow proper healing and to decrease infection. The surgery is described in more detail in "The Surgery" section.



Figure 3: Post-ORIF surgery x-ray of a distal fibula fracture

Preparing Yourself and Your Home before Surgery

The healing process is gradual and takes time after surgery. Prior to going to the hospital, plan accordingly for your return home. Most patients return home the same day of surgery.

- Ask your spouse, children, or friends if they can assist you with your recovery process. This includes helping you with ankle exercises, mobility, and other activities of daily living.
- If desired, ask friends to visit you while you recover.
- If you smoke, this could slow down the recovery process and slow healing. Please consider quitting or decreasing smoking prior to the surgery and during recovery.
- If you are interested in receiving assistance from a public health nurse or a home healthcare agency, please choose the agency before you are hospitalized. Seek help from your physician's office to assist you with these arrangements. In most cases, insurance agencies cover the cost of home health care 7 to 10 days after surgery. A nursing assistant is available to visit your home to assist you with daily activities. You also have access to a home physical therapy program.
- Be prepared for changes in your activity level.

- Plan to leave your home clean and free of clutter. Removing rugs will help prevent falls.
- Place things such as newspapers, hobby supplies, the television remote, the telephone, and any other items you regularly use within reach for easy access.
- Organize your kitchen so that utensils you often use are easily available.
- Prepare and freeze some meals in advance.
- Ask mail carriers to deliver to your door, if possible.

What to Bring to the Hospital

- Leave valuables at home, especially jewelry.
- Do not bring the medication that you usually take. It is vital that you have a list with the appropriate dosages. The hospital will request this information at the time of registration.
- Bring comfortable, non-skid athletic or walking shoes. Elastic laces to eliminate the need to tie your shoes are available upon request. Also, athletic tennis shoes with hook and loop fasters can be requested. Slip-on shoes are another potential option.
- Pack clothes that are loose fitting and soft.

Your Hospital or Surgery Center Stay

You and your surgeon will decide a time to come to check in to the surgery center or hospital. It is important to follow these instructions:

- Discontinue taking medicines that have the potential to cause bleeding. The most common medicines that fall into this category include aspirin, anti-inflammatories (including Advil, Motrin, Naprosyn), and blood thinners (such as Plavix and Coumadin). Consult your physician for a complete list.
- You should stop taking all herbal and over-the-counter supplements one week before surgery. Some supplements affect bleeding tendencies and may cause problems with wound healing. You may continue multivitamins and should take 500 mg per day of Vitamin C starting when surgery is scheduled and may continue for one month after surgery. Vitamin C helps prevent bleeding during the operation and promotes healing.
- Prior to surgery, do not eat or drink anything after midnight. An empty stomach before you receive the anesthetic helps prevent nausea, vomiting, and other complications.
- Shower or bathe the evening or morning before surgery. This helps decrease the amount of

bacteria on your skin. Also, a good night's rest is important before surgery.
- Do not wear any makeup the morning of surgery.
- Only take the medication with a small sip of water that your nurse or physician counsels you to take on the morning of your surgery.

Morning of Surgery

- The nursing staff will take your vitals (temperature, pulse, respiration rate and blood pressure).
- Support stockings are available to promote circulation to the legs.
- An intravenous (IV) line will be started before surgery.
- You should receive a dose of antibiotics prior to surgery.



Going to Surgery

- You will be asked to empty your bladder.
- Remove all contact lenses, dentures, jewelry, and nail polish.
- Glasses and hearing aids can be worn, if necessary.
- Family and friends will be instructed where to wait.
- A surgical orderly will bring you on a stretcher to the preoperative waiting area.
- To prepare for surgery, the affected ankle and leg may be scrubbed and the hair clipped.
- The anesthesiologist will discuss the type of anesthesia you will receive.



Anesthesia

In most cases, the surgery is performed under general anesthetic. A regional local anesthetic block can be performed by the anesthesiologist before surgery. This is a nerve block that will numb the nerves to your leg to help decrease or minimize postoperative pain 6 to 18 hours following surgery. You may experience some numbing and tingling in the leg or foot as the block wears off. There is a slight risk of nerve damage with this procedure, but the benefits of pain relief are typically thought to outweigh the risks.

The Surgery

The type of surgery performed for most ankle fractures is open reduction and internal fixation. Surgery on ankle fractures begins with the surgeon making an incision over the ankle. Blood vessels, nerves, and tendons are carefully moved aside to view the fractured bone or bones. Then, the pieces of the broken bones are realigned and placed together like a jigsaw puzzle. This technique is "open reduction". In order to hold the fracture in place, metal plates and screws are used. This second technique of using this hardware is "internal fixation". Internal fixation provides stability and the ability for the patient to return to previous levels of activity. Depending on the severity of the fracture, small wires may be placed around the tibia and fibula for extra support. If the tibia is fractured an additional screw may be placed to hold that bone fragment in place on the inside of the ankle. Final alignment with x-ray is checked before the appropriate blood vessels, nerves, and tendons are returned to their proper location. The skin is closed with stitches and a splint is applied at the end of the surgery.

Risks Associated with Surgery

Most patients do not experience complications from a distal fibula fracture surgery. However, there are risks that accompany surgery. Potential risks with any surgery include pain, bleeding, infection, damage to surrounding structures, nerves or blood vessels, failure to heal, failure to cure, need for additional procedures, any medical or anesthetic complication, loss of limb or death. The latter two are extremely rare with outpatient surgery.

The surgeon will discuss the risks, benefits, and alternatives including non-operative treatment. Should you choose to proceed, the surgeon will seek your informed consent and answer all of your questions.

Following your doctor's postoperative instructions and rehabilitation course can minimize risk factors. Also, disclose all medical conditions and current medications you take.

What to Expect After Surgery

After surgery, you will be moved to the Post-Anesthesia Care Unity (PACU). Your relative(s) will be notified when you are here. The PACU plays a significant role in pain management and regulating nausea as you wake up from anesthesia. Nurses will monitor your alertness, pain level, vital signs, and need for medication.

In the PACU, you may notice a wide range of equipment. The room is brightly lit, and as you wake up noise may seem louder than usual. If you feel cold, blankets are available. It is normal to receive oxygen through a facemask and to feel pain or discomfort following surgery. Pain medication can be given to make you more comfortable. Tell your nurse if you suspect the pain medicine is causing you nausea.

On average, the length of stay in the PACU is about one hour. Your relative may check with the nursing staff if there is an extended delay. When the anesthesiologist decides you are ready to leave, your relative will be notified. Finally, you will be transported in a wheelchair to your car.

First Post-Operational Visit

Typically, patients will have a follow up appointment scheduled about 10 to 14 days after surgery. Be sure to call the office to set up an appointment if you do not have one. At the first follow up appointment, the physician will order x-rays to check the alignment of the fracture and ankle. Furthermore, the physician will make sure the plates and screws are in place. Also, the doctor will check the incision to ensure that it is clean, dry, and healing well. The sutures may be removed and steri strips will be placed on the incision site. These can get wet, but not submerged. They will eventually fall off. In two weeks, any leftover steri strips should be removed. Surgeries treated with plates and screws will usually be placed in a Cam Walker boot. At this point, you can usually start some gentle range of motion exercises of the ankle as well as foot strengthening. Patients may begin partial weight bearing with crutches as tolerated usually within 4-6 weeks after surgery. Make sure to check with you surgeon before doing this.

Second Post-Operational Visit

Patients will typically follow up with the surgeon 4 to 6 weeks after the first post-operational visit. Again, the physician will order x-rays to evaluate healing of the bone and the alignment of the hardware. The incision and range of motion of the ankle will be assessed, as well. At this point if the fracture is healed, the patient will discontinue wearing the walking boot. The patient can progressively bear weight as tolerated, but high impact activities like jumping or running should be avoided. If the fracture is not healed, the boot has to be worn and the exercises should continue.

Third Post-Operational Visit

After the second post-operational follow up appointment, a third visit will be scheduled about six weeks afterward to check the progress of the fracture. The physician will check your gait, range of motion of the ankle, and strength. The stability of the ankle will be assessed, also. If the ankle is stable and completely healed, you may be able to progressively increase back to activities as tolerated. Typically, high impact cutting activities should be avoided for four months following surgery.

Discharge Instructions for Ankle

DRESSING:
After surgery, you will be in a bulky dressing (bandage) with a plaster splint that goes from the knee to your ankle with your toes free. The splint is similar to a cast. The splint should not be removed and must be kept dry. When showering or bathing, cover the splint and with a plastic bag to keep everything dry. The splint protects the incision and the surgical repair, as well as lessens swelling.

SWELLING:
Typically, swelling is experienced after the surgery. To minimize the swelling, elevate your leg above your heart as much as possible. A couple of pillows are good to use to keep the leg elevated while sleeping. The use of ice packs or the ice cooler and pad over the affected ankle improves the swelling and gives pain relief. Use this for approximately 20 minutes at a time every 2 hours during the day to help swelling and pain. Also, keep moving your toes to decrease swelling.

NUMBNESS/TINGLING:
It is not unusual to experience some diffuse numbness and tingling along affected ankle. In most situations, the feeling will subside within about 6 to 8 hours. If there is continued numbness, you should contact our office.

PAIN RELIEF:
You will be prescribed pain medication to take at home after your surgery. This is a narcotic pain reliever. Take 1 to 2 tablets every 4 to 6 hours as needed for pain. Usually, it is recommended to take the pain medicine every 4 hours for the first 24 to 48 hours. Then, take it on an as needed basis. Keep in mind that the medication will cause drowsiness and should not be used with alcohol. Furthermore, taking this medication on an empty stomach may result in nausea. It is not unusual to feel discomfort when lying down to sleep at night, so you may find it beneficial to take the pain medication before you go to sleep. If unusual side effects occur, please discontinue the medication and contact our office. When additional refills are needed, please contact our office or the pharmacy during regular business hours. Hopefully, in a short period of time you will be able to use over-the-counter medications for relief of pain and save the prescribe medication for use only when necessary.

DIET:
The day after surgery, drink lots of fluids and eat soft, nutritious foods. An adequate diet is essential for the healing process.

NAUSEA AND VOMITING:
Although unusual, both nausea and vomiting can be experienced after anesthesia. If you have a tendency for this, please discuss it with the anesthesiologist. Otherwise, it is usually alleviated with a clear liquid diet.

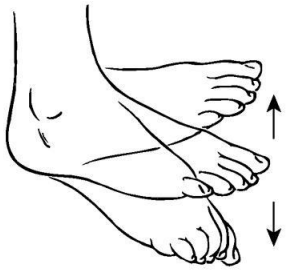
DROWSINESS:
After anesthesia, drowsiness may persist for quite a while. It should cause no undue concerns. Do not drive until you feel clear-headed.

SIGNS OF INFECTION:
With any surgery it is very important to be aware of signs of infection, which can include: unusual looking incision such as increased redness or smell, green or yellow drainage, and an increased fever. It is normal to have a slight body temperature after surgery. However, if your body temperature reaches above 101 degrees, you need to contact our office immediately.

Physical Therapy

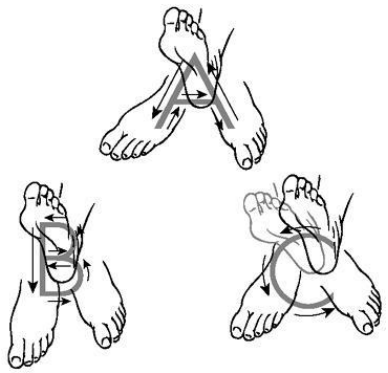
Following surgery, you will begin your ankle exercise program when cleared by your surgeon. Once the bone is healed and the splint removed, you will begin a physical therapy program to return strength and mobility to the ankle. As healing progresses and mobility returns, you will engage in heavier strength training to restore strength and build muscles in the ankle. Most patients can resume light aerobic activity such as swimming a month or two after surgery.

Below are some gentle range-of-motion and strengthening exercises frequently done starting with no weight.



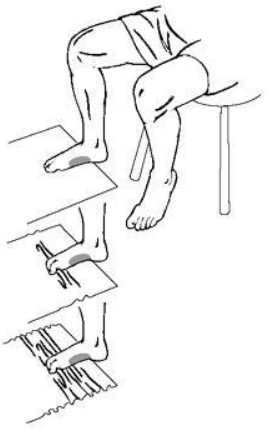
RANGE OF MOTION – Active Dorsi/Plantar Flexion

1. Pull your toes and foot toward your body as far as possible, then point the foot and toes away from body as far as possible.
2. Perform this exercise with the knee straight and then with the knee bent.
3. Hold this position for 15 seconds.
4. Repeat exercise 3 times, 3 times per day.



RANGE OF MOTION – Ankle Alphabet

1. Write all the capital letters of the alphabet with your foot and ankle. The motion should come from your foot and ankle, not your hip or knee.
2. Move the foot and ankle slowly, writing the letters as large as possible/comfortable for you.
3. Repeat exercise 15 times, 9 times per day.



STRENGTH - Towel Curls

1. Sit in a chair and place a towel on a non-carpeted floor. Place your foot/toes on towel as shown. (You may also stand to do this exercise rather than sit.)
2. Curl/pull towel toward you with your toes while keeping your heel on the floor. Move towel with toes only. Do not move your knee or ankle.
3. If this is too easy, place a lightweight (book, hand weight, etc.) at the far end of the towel.
4. Repeat exercise 15 times, 9 times per day.

When to Contact Your Surgeon

Our physician will give you instructions about how to care for your stitches or staples. As a general rule, you will want to keep the surgical incision clean and dry. Your doctor will often place a surgical bandage over the site that they will remove at a follow-up visit. Expect some numbness at the incision site, but call your doctor if you begin to experience:

- Swelling with worsening pain
- Redness
- Foul-smelling drainage or odor from the splint
- Fever (temperature above 101.5 degrees Fahrenheit or 38 degrees Celsius for more than 12 hours
- Increased pain that is unrelieved with pain medications
- Severe ankle pain

Future Fracture Prevention

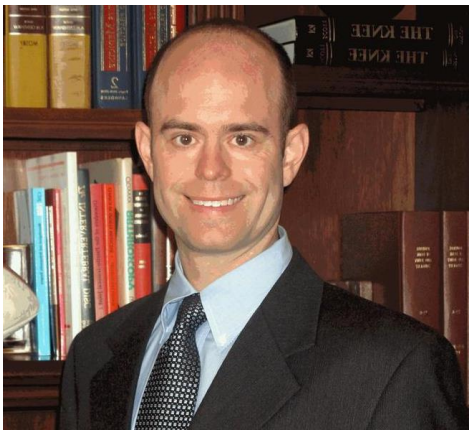
Your bones have many blood vessels that can promote healing. With time, your body will start to grow new threads of blood cells that will ultimately grow back together, helping to heal the bone. Please remember that even though the fracture has been repaired, it can happen again. Practice caution whenever possible to prevent re-injury. This includes eating a diet rich in bone-boosting foods, such as those that contain calcium and vitamin D. Wearing protective gear, like pads, braces, or a helmet can all help you prevent a future fracture.

Frequently Asked Questions

1. *How long does the surgery take?*
   The levels of distal fibula fractures vary and the treatment options are so broad that it is hard to describe what to expect. An average distal fibula fracture surgery takes about an hour, but the time can vary depending on the fracture.

2. *When can I return back to normal activity?*
   Most patients do return to all their former activities. What will happen in your specific case depends on the nature of your injury, the kind of treatment you and your surgeon decide upon, and how your body responds to the treatment. It is suggested to allow 3-4 months of healing before completely returning to sporting activities.

About Your Surgeon



Chad Stephen Conner, MD specializes in sports medicine and arthroscopic and reconstructive surgery of the shoulder, hip, knee, and ankle. He is board certified in orthopedic surgery by the American Board of Orthopedic Surgery with a subspecialty certification in orthopedic sports medicine.

Dr. Conner grew up in Dallas, Texas and attended Lake Highlands High School. Beginning at age 5, he practiced gymnastics and went on to compete for the University of Minnesota gymnastics team in Minneapolis, Minnesota. He attended The University of Texas Medical Branch for his medical school training and subsequent orthopedic surgery residency training. Following this, Dr. Conner completed a fellowship at the Southern California Orthopedic Institute. There he specialized in sports medicine, arthroscopy, and reconstructive surgery of the shoulder, hip, knee, and ankle. He helped care for athletes from the high school level to the professional level. His training also included specialization in shoulder replacement surgery and reverse total shoulder replacement.

Dr. Conner currently practices at the Waco Orthopedic & Sports Medicine Clinic in Waco, Texas. He is a team physician for Reicher Catholic High School, Bosqueville High School and Live Oak Classical School. He also provides a free student-athlete Saturday sports clinic during football season. He is a member of the Arthroscopy Association of North America, the American Orthopedic Society for Sports Medicine, and the American Academy of Orthopedic Surgeons. He is board certified in orthopedic surgery by the American Board of Orthopedic Surgery with a subspecialty certification in orthopedic sports medicine. He has done extensive research on treatment of massive rotator cuff tears, ACL reconstruction, hip arthroscopy, and ankle arthroscopy. He is also involved in teaching hip arthroscopy as an associate master instructor at the Arthroscopy Learning Center in Chicago, IL. With Baylor University, he gives lectures for student classes and is involved in the Baylor Health Science Studies internship program mentoring students interested in orthopedic surgery. Dr. Conner also volunteers at a community outreach organization called Mission Waco, which strives to provide Christian-based holistic, relationship-based programs that empower the poor and marginalized and was named Business of the Year by Mission Waco for 2013. He leads a monthly orthopedic and rehabilitation clinic at Mission Waco's free health clinic and has partnered with the hospitals to provide surgical care as well. Outside of the office, Dr. Conner enjoys his wife and children, church, workouts, wakeboarding, and the outdoors.

Notes