

Arthritis of the Foot & Ankle

Introduction

If you feel pain and stiffness in your foot and/or ankle that has been increasing over time, it could be arthritis. If left untreated, arthritis can worsen and restrict your ability to walk. With proper treatment, it may be possible to slow the development of the disease and increase your quality and productivity of life.

Your Orthopaedic Physician/Surgeon

Dr. Roster is a medical doctor (MD) who has undergone specialty education and training in orthopaedic medicine and surgery, with additional subspecialty fellowship training in foot and ankle surgery. This extensive preparation and experience equips him to diagnose and treat your arthritis. He may also incorporate other medical specialists to care for you including a rheumatologist (medical arthritis physician), physiatrist (rehabilitation specialist), nurse practitioner or physician's assistant, pedorthist (footwear specialist), physical or occupational therapist, orthotist (brace specialist), and/or a clinical social worker to help with practical needs. Considering the long-term, debilitating nature of the disease, selection of a qualified orthopaedic physician/surgeon and medical team is essential to your long-term health.

Foot & Ankle Anatomy

The 28 bones and 30+ joints in the foot are held together by ligaments, which are tough bands of tissue connecting the bones. These ligaments work together with the muscles and tendons (which connect muscles to bones) of the lower leg, ankle, and foot to coordinate and control the motion that allows you to walk. If arthritis develops in one or more of these joints, balance and walking may be affected. In the lower extremity arthritis most often occurs in the ankle joint, but other joints may also be affected:



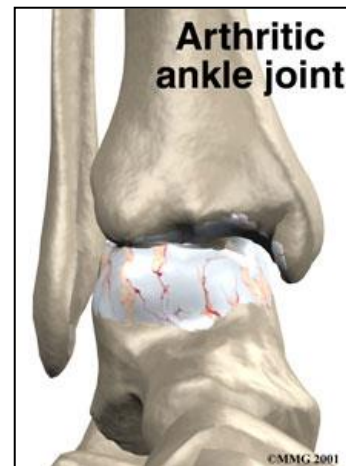
- **Ankle joint:** Where the tibia (shinbone) meets the talus (uppermost foot bone).
- **Hindfoot joints:**
 - ✓ **Subtalar joint.** Where the bottom of the talus connects to the calcaneus (heel bone).
 - ✓ **Talonavicular joint:** Where the talus connects to the navicular (inner midfoot bone).
 - ✓ **Calcaneocuboid joint.** Where the calcaneus (heel bone) connects to the cuboid (outer midfoot bone).
- **Midfoot joint.** Where a metatarsal (forefoot toe bone) connects to the cuneiforms (midfoot bones).
- **Great toe (1st metatarsophalangeal) joint:** Where the first metatarsal (long toe bone) connects to the phalange (short toe bone). This is where bunions usually develop.

Joints and bones of the foot and ankle.

Arthritis – What is it?

Arthritis means inflammation within a joint. It is a broad term for several degenerative conditions that destroy the joint's normal anatomy and function by decreasing both the cartilage that cushions the bone and the joint fluid that lubricates the joint. Cartilage appears as a hard, smooth material at the end of the bone – like the surface on the end of a chicken bone. Its cushioning and protective function allows for smooth, painless motion within the joint. The synovial joint fluid then lubricates the joint as you move. In post-traumatic arthritis, cartilage becomes soft, thin, frayed, rough, or eventually completely eroded away. The body's ability to heal cartilage decreases with age and arthritis eventually leads to “bone-on-bone” contact. This leads to an inflamed, swollen, and painful joint – the symptoms of arthritis.

Arthritis in its various forms is the leading cause of disability in the United States. It can occur at any age, although it tends to progressively occur with age. While there is no cure for arthritis, there are many treatment options available. It is important to seek help early to manage its progression and side effects.



Types of Arthritis

- **Osteoarthritis:** This is a degenerative joint disease localized to specific joints and occurring most commonly at middle age and slowly progressing with age. Other risk factors include heredity and obesity.
- **Rheumatoid arthritis:** This is an autoimmune (system-wide) inflammatory disease that can begin early in life. The disease causes the immune system to attack the lining (synovium) of many joints in the body. There is no known cause, but a genetic component activated by some type of trigger (e.g. infection or environmental factor) is suspected. Other forms of inflammatory arthritis include gout, lupus, ankylosing spondylitis, and psoriatic arthritis.
- **Post-traumatic arthritis:** This form of arthritis is similar to osteoarthritis, but as the name suggests it follows some type of injury to the foot or ankle. Recurrence (e.g. repeated sprains) increases the risk of arthritis. An injured joint is seven times more likely to become arthritic because the injury causes the body to secrete hormones that stimulate cartilage cell death. Symptoms often occur years after a fracture or ankle sprain, and the risk is increased if there was joint dislocation at the time of injury even if proper medical care was received.

Symptoms of Foot & Ankle Arthritis

Common symptoms of an arthritic joint include:

- ✓ An appearance or feeling that the joint is larger
- ✓ Increased pain with motion/activity, described as being like a “toothache” inside the joint
- ✓ Stiffness or reduced motion
- ✓ Swelling that may increase with activity
- ✓ Sense of catching or grating
- ✓ Difficulty walking
- ✓ Prominences or bone spurs

Treatment Options

Proper treatment addresses not only pain and swelling, but also any deformity and functional loss caused by the arthritis. You will need to provide a complete medical history, undergo a physical examination, and have weight-bearing x-rays taken of your ankle and/or foot. You may need more specific testing, e.g. bloodwork (lab studies), a computed tomography (CT) scan, and/or a magnetic resonance image (MRI). Treatment options will vary based on the type, location, and severity of the disease.

Conservative (Nonsurgical) Treatment

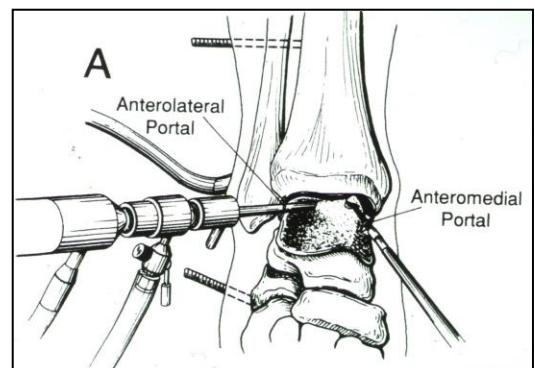
- ✓ Anti-inflammatory medications
- ✓ Shoe inserts (orthotics) for stability and support
- ✓ Custom-made hard/stiff (Arizona) brace or ankle-foot orthosis (AFO)
- ✓ Special shoe designs, e.g. stiff-soled, rocker bottom
- ✓ Carbon fiber plate to stiffen shoes
- ✓ Assistive device (e.g. cane, walker)
- ✓ Physical therapy
- ✓ Individualized non-impact exercise (e.g. swimming, bicycling) and flexibility (e.g. yoga) program
- ✓ Avoidance of painful or exacerbating activities
- ✓ Weight control
- ✓ Nutritional joint-specific supplements
- ✓ Steroid injection into the joint

Surgical Treatment

If conservative care is ineffective for controlling pain and retaining function, surgical treatment might be considered a good option depending on the type, severity, and location of the arthritis. Surgical options may include one or more of the following procedures: *debridement* (joint “clean-out”), *arthrodesis* (joint fusion), and/or *arthroplasty* (joint replacement, if applicable to the involved joint).

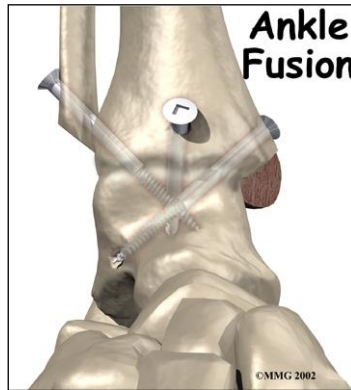
▪ Debridement (“Clean-out”)

Sometimes surgery can be done with minimally invasive techniques such as arthroscopy. Often called an ankle *scope*, arthroscopy is an early-phase surgical intervention to identify and remove damaged cartilage that causes ankle joint pain. Two small (approx. 1/4”) incisions are made on the front of the ankle as portals through which metal pencil-like instruments are passed. One portal is used for the camera, the other is used for passing instruments to probe and clean the joint surface and remove any bony spurs along the joint edges.



Arthrodesis (Joint Fusion)

Fusion involves causing two bones to become one continuous bone by removing all cartilage in the arthritic joint and stimulating the bone to grow across the joint. The surgeon uses mechanical action to “rough up” the end of each bone surface and uses biologic processes (bone graft or bone hormones) to stimulate bony formation. Then by placing screws across the joint to hold the bone ends together, the body heals the joint line by knitting the two bone ends together.



Patients opting for a joint fusion have advanced “end-stage” arthritis and may have already lost most (if not all) motion and function of the joint – and what little they have is very painful. After a fusion, there is no joint motion and no pain. The patient still has motion in the adjacent joints to provide support for walking. This is a good surgery for those who have been suffering from arthritic pain for years. Apart from the standard risks of surgery (wound problems, infection, nerve injury, and vessel injury), the primary risk of this surgery is a *nonunion*, meaning the fusion (bone knitting) does not complete itself by approximately 6 months, or a *malunion*, where the ankle is fused in a misaligned position. In either case, the pain continues or worsens and the fusion surgery must be repeated. Also, with any joint fusion patients face the likely development of arthritis in adjacent joints due to increased stress. For an ankle fusion, this includes the subtalar and midfoot joints.

Other areas that are also commonly fused include the subtalar joint, which gives the back-and-forth motion of the hindfoot/heel; the midfoot (tarsometatarsal or mid-tarsal) joints along the arch of the foot; both the hindfoot and the midfoot (a *triple arthrodesis*); and the first toe (metatarsophalangeal) joint due to *hallux rigidus* (stiff/rigid first toe).

▪ Arthroplasty (Joint Replacement)

Used in Europe for 20 years and approved by the USFDA in 2009, the S.T.A.R.[®] prosthesis (pictured right) allows the arthritic ankle joint to be replaced with an artificial joint implant. The benefits compared to fusion include joint motion and reduced stress (arthritis) in adjacent joints. Risks include wound problems and need for revision surgery since all joint prostheses have a limited life span and may loosen or fail in the future. Surgery is also needed if bony growths surround the prosthesis and impede its function. If the ankle joint should fail in the future, ankle fusion may be an option at that time.



Surgical Recovery and Rehabilitation

Like most surgeries, foot/ankle surgery can be painful and you will be given narcotic medications that you will wean down over time. Post-operative swelling is inevitable and “progress” will be measured in terms of decreased pain and increased function. Reduced yet persistent swelling may be the longest after-effect of surgery, but strategies can easily be employed to help expedite that process including leg elevation (“toes above the nose”) and graduated compression stockings (not the same as TED hose used for nonambulatory patients in the hospital). Recovery will most likely take the following course:

- **After arthroscopy (scope):** In the operating room your incisions will be covered with sterile dressings and wrapped with soft protective materials and an ace wrap. You may place as much weight down as you can tolerate, using crutches for balance until you can bear full weight. The dressing and sutures will be removed at two weeks, after which you can shower and begin wearing regular shoes, depending on the amount of swelling. Most patients are back to baseline activities in 3-4 months.
- **After arthrodesis (joint fusion):** In the operating room your incisions will be covered with sterile dressings and the lower leg will be placed in a supportive, firm splint. You will be non-weightbearing with crutches. The splint and your sutures will be removed at two weeks and you will be placed in a non-weightbearing hard cast. One month later (six weeks after surgery) you will be transitioned to a walking cast, followed one month later by a walker boot (a removable cast). Expect an initial recovery period of 4-6 months, with continual progress in returning to regular shoe wear and activities from 6-12 months after surgery.
- **After arthroplasty (joint replacement):** In the operating room your incisions will be covered with sterile dressings and the lower leg will be placed in a supportive, firm splint. You will be non-weightbearing with crutches. The splint and your sutures will be removed at two weeks and you will be placed in a walker boot (removable cast) and will be allowed to gradually increase your activities over the following months, including physical therapy to regain strength and motion. Expect an initial recovery period of 3-4 months, with continual progress in returning to your former shoe wear and activities from 4-9 months after surgery.

Your Personal Role and Responsibility

Your part in the success of your arthritis management and/or surgery cannot be overemphasized. To optimize your health during conservative arthritis treatment and before/after surgery, you need to have good nutrition, exercise, weight control, and (for smokers) cessation of tobacco. After surgery, strict compliance with your medical team's instructions is the largest component to your recovery. Pain control is achieved by taking medications as prescribed, elevating the extremity multiple times daily, and weight-bearing only as instructed (including not). Wound (incision) healing depends on good protein intake and hydration and NO smoking. Nicotine causes the blood vessels to constrict, essentially blocking (choking) the tissues from receiving the blood flow they need to heal.

You have made an important step in seeking proper diagnosis and treatment for your health. Your choices regarding management and treatment of your arthritis is just that – your choice. We are available to answer questions and assist you in living life to the fullest.

For additional information:

- American Orthopaedic Foot & Ankle Society, www.aofas.org.
- American Academy of Orthopaedic Surgeons, www.aaos.org
- Small Bone Innovations, Inc. (S.T.A.R.[®] prosthesis), www.totalsmallbone.com

Position Statement: Total Ankle Replacement Surgery

Background

The American Orthopaedic Foot and Ankle Society (AOFAS) is a medical specialty society whose 1,800 members are orthopaedic surgeons specializing in the surgical and non-operative treatment of injuries, disease, and other conditions of the foot and ankle. The AOFAS promotes quality patient care through education, research and training of orthopaedic surgeons and other health care providers, and serves as a resource for government, industry and the health care community on issues concerning the medical & surgical care of the foot and ankle.

Patient Selection

Ankle arthritis has several accepted operative and non-operative treatment options. Operative treatment is generally considered for patients with persistent symptoms that fail to respond to appropriate and comprehensive non-operative treatment measures. Surgical options include joint debridement, distraction arthroplasty, osteotomy, arthrodesis, and total ankle arthroplasty. Traditionally, arthrodesis was the favored treatment for end stage ankle arthritis. However, the restricted motion following arthrodesis increases the stresses on the surrounding joints leading to further arthritic changes. Total ankle arthroplasty preserves motion and may be protective against further degeneration while providing equivalent pain relief.

Over the past decade, total ankle replacement surgery has evolved as an acceptable and viable alternative to ankle arthrodesis in select patients with ankle arthritis. These include adult patients with primary, post-traumatic, and rheumatoid arthritis who have moderate or severe pain, loss of mobility, and loss of function of the involved ankle. Before considering total ankle replacement, patients should have completed several months of conservative treatment, should have satisfactory vascular perfusion in the involved extremity, and must have adequate soft-tissue coverage about the ankle that affords a safe surgical approach to total ankle replacement. In such patients, high-level evidence indicates that total ankle replacement safely relieves pain and may provide superior functional results when compared to ankle fusion.¹⁻⁵ Additional concomitant or sequential surgical procedures may be required in some patients to optimize outcome.

Provider Qualifications

Total ankle replacement surgery should be performed by board-certified or board-eligible allopathic or osteopathic orthopaedic surgeons with appropriate training and education. When considering total ankle replacement, patients should consult with a qualified orthopaedic surgeon.

Conclusion

Total ankle replacement surgery is a safe and effective treatment option for select patients with ankle arthritis. In many patients total ankle replacement surgery substantially improves function, reduces pain, and allows for an improved quality of life. Patient mobility and quality of life factors contribute to longer independent living and to controlling overall health care costs.

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