



ANKLE OSTEOARTHRITIS



DEFINITION

Just like in all other joints in the body, osteoarthritis can develop in the ankle (talocrural joint). At the ankle the up and down movements of the foot are generated (extension and flexion, Fig. 1).

Osteoarthritis is a degenerative joint disease that leads to progressive cartilage degradation and bone spurs around the joint causing stiffness and reduced mobility. This process is usually accompanied by intermittent, activity-dependent inflammatory reactions in the joint with swelling and pain.

The main causes of ankle osteoarthritis vary, with post-traumatic osteoarthritis being the most common (approx. 80%). This type develops as a result of previous injuries such as fractures or ligament tears, which can lead to joint degeneration over time (even decades later). Metabolic and inflammatory diseases, such as rheumatoid arthritis, also play a role, as they can cause joint damage that leads to osteoarthritis. Overuse and mechanical overload put excessive stress on the joint, accelerating wear and tear. Lastly, malalignment and chronic instability of the ankle can contribute to cartilage degradation, further increasing the risk of osteoarthritis.

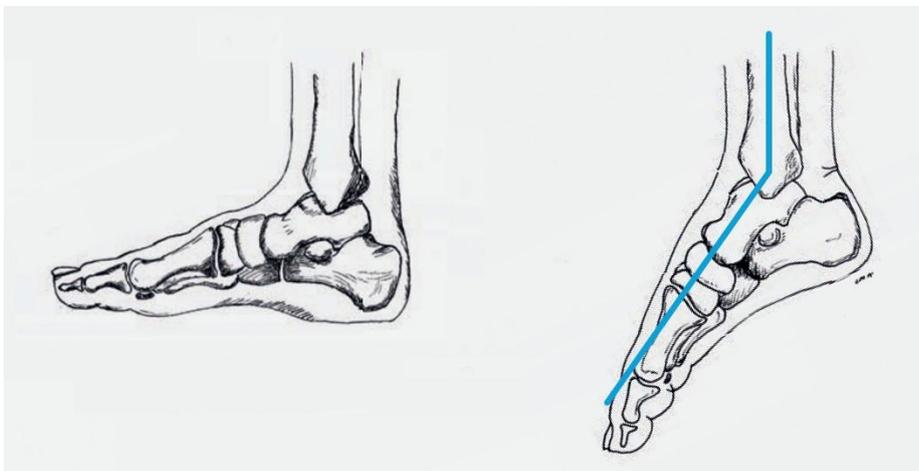




SYMPTOMS

Osteoarthritis of the ankle typically presents with pain and swelling around the ankle. Pain occurs mainly with movement and weight-bearing, but it may also be present at rest. As disease progresses another common symptom is stiffness, which is especially noticeable in the morning or after periods of inactivity. In the beginning, the restriction of movement is often not noticeable as it develops slowly. Occasionally stiffness leads to difficulties when walking uphill or downhill or the foot is held slightly outwards to be able to roll better. Additionally, a grinding or cracking sensation, known as crepitus, can be felt in the joint. Swelling may also occur due to inflammation of the synovial membrane and fluid accumulation in the joint.

1 Ankle joint and its mobility



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EXAMINATION

The physical examination often reveals a swollen joint with noticeable thickening of the bone and sometimes redness. Joint mobility and stability are assessed. Mobility is often restricted and painful. The normal rolling of the foot is then no longer possible.

An X-ray is commonly used to identify the extent of the osteoarthritis (joint space narrowing) and the formation of osteophytes (Fig. 2). MRI is particularly helpful for evaluating soft tissues, cartilage damage, and detecting early-stage osteoarthritis. In certain cases, a CT or SPECT-CT may be used to provide detailed images of the bone structures, which is especially useful to evaluate the adjacent joints.



2 Drawing and X-ray showing osteoarthritis at the ankle



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TREATMENT

A) NON-SURGICAL

Osteoarthritis is not dangerous, and treatment is based on pain and not on X-ray-images. Conservative therapy for ankle osteoarthritis includes several strategies to manage at least pain and swelling. Pain management is typically achieved through the use of non-steroidal anti-inflammatory drugs, cooling and elevation which help reduce pain and inflammation. Ankle braces can provide additional support and reduce swelling and pain. Physiotherapy plays a key role in improving soft tissue pain, strengthening the muscles around the joint, and enhancing joint stability. Occasionally, injections of corticosteroids may be used to provide temporary pain relief in extremely painful situations. Especially in the case of asymmetrical arthrosis, shoe inserts can occasionally help to unload the more affected region of the joint. A shoe with a rather stiff sole and rocker bottom can aid alleviating symptoms. Examples of such shoes are Anova medical, Xelero or certain sneakers (Fig. 3). It is important that you have good support in the shoe.

3 Shoes with a rather stiff sole and rollover support (e.g. Anova Medical, Xelero, Hoka)



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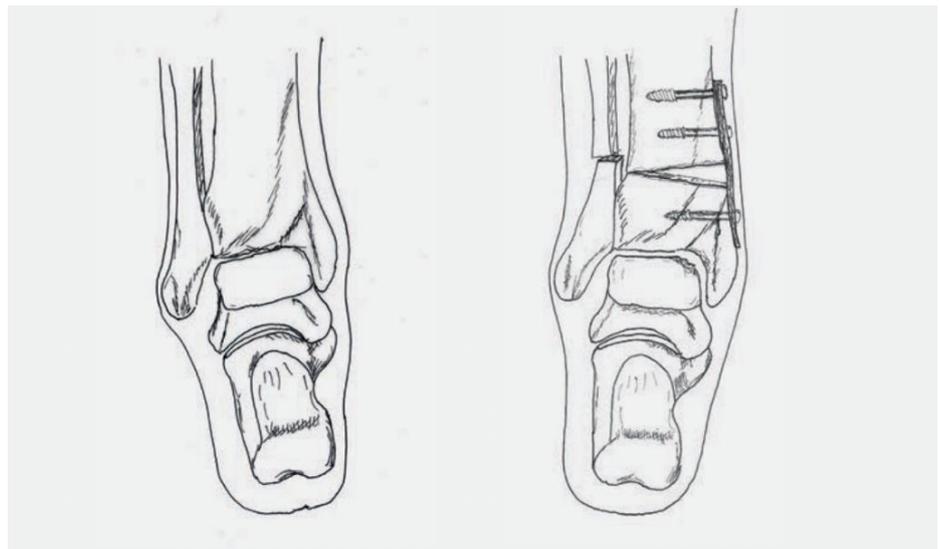
B) SURGICAL

If conservative treatment fails and pain persists, surgery is a reasonable option. There are joint-preserving (1 and 2) and non-joint-preserving (3 and 4) procedures:

1. Realignment Osteotomy (Fig. 4)

Realignment surgery is used to correct joint malposition and distribute weight more evenly. If wear and tear caused by an altered leg axis affects only one part of the joint and is not yet too advanced, the leg axis can be corrected. This procedure shifts the load from the worn side of the ankle joint to the still healthy side. The correction is typically performed just above the ankle, and sometimes on the heel. During the procedure, a wedge is removed, and the tibia is closed on either side, or the bone osteotomized and opened in a wedge-like manner. In most cases, the fibula also needs to be "broken" to allow for the correction. The bone is then fixed in place with a plate and screws. Postoperatively, similar to a fracture, the ankle joint must be immobilized in a Vapoped boot or cast (Fig. 8) for six weeks, with partial weight-bearing maintained during this period.

4 More evenly distributed weight due to realignment surgery (osteotomy)



4

2. Arthroscopy with Debridement and Spur Removal

This minimally invasive procedure can be considered if there is localized pain and it is more of a pinching character. Loose cartilage fragments are removed, and joint surfaces smoothed. The removal of bone spurs might improve mobility.

Although the course of osteoarthritis cannot be stopped by these first two joint-preserving treatments, they can, in the best circumstances, postpone and/or considerably lessen the symptoms, at least temporarily.



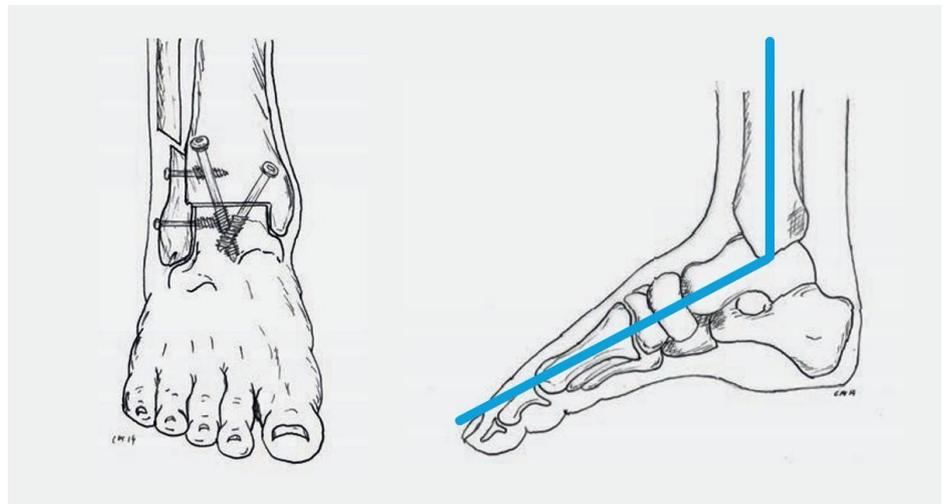
To treat advanced osteoarthritis with associated pain and ineffective conservative treatment, the following two joint-sacrificing options remain to finally eliminate the osteoarthritis.

3. Fusion (Arthrodesis, Fig. 5)

For many years, ankle fusion was considered the standard treatment. Unlike other joints, joint replacement for the ankle was developed later. This delay was due to initial challenges with artificial joints, as well as the fact that a stiff ankle joint can still function well, unlike a stiff knee or hip. The loss of mobility in the ankle joint is noticeable but has minimal impact on walking and daily activities, as other joints in the foot compensate for the reduced motion. However, the increased load on these other foot joints can lead to wear and tear (secondary osteoarthritis) over time, usually taking 10–20 years to develop. Today, arthrodesis remains a successful treatment, especially for individuals who heavily rely on their ankle joint and do not have osteoarthritis in other foot joints.

The joint is fused using screws, and sometimes a plate. After surgery, the ankle must be immobilized in a plaster cast (Fig. 8, right) for at least 6–8 weeks, with only partial weight-bearing allowed. The main risk following this procedure is the failure of the bones to fuse (non-union), and in some cases, the surgery may need to be repeated.

5 Ankle fusion and mobility after fusion



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4. Total Ankle Replacement (Fig. 6)

Since the end of the 20th century, after initial setbacks, well-functioning prostheses for the ankle joint have been developed. While a joint replacement typically only provides minimal improvement in mobility, this residual movement helps protect the adjacent joints.

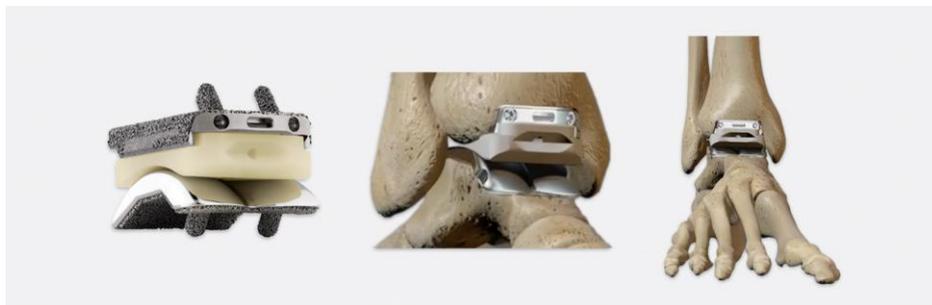


THE ANKLE OSTEOARTHRITIS

As a result, replacement is a good option, particularly in cases where there is additional osteoarthritis in other foot joints or when other foot joints have already become stiff.

After surgery, the ankle is immobilized in a plaster cast or Vacoped boot (Fig. 8) for 6 weeks, with initial partial weight-bearing, at least until the wound has safely healed. Surgical risks primarily include wound healing issues and infections. In approximately 1 in 4 cases, some symptoms persist after ankle replacement, eventually necessitating a follow-up procedure. Over time, prostheses may loosen or wear out. According to various studies, the 5-year survival rate of total ankle replacement is around 90%, with the 10-year survival rate ranging from 75% to 80%.

6 Total ankle replacement with metal implant at the top and bottom and polyethylene inlay in between

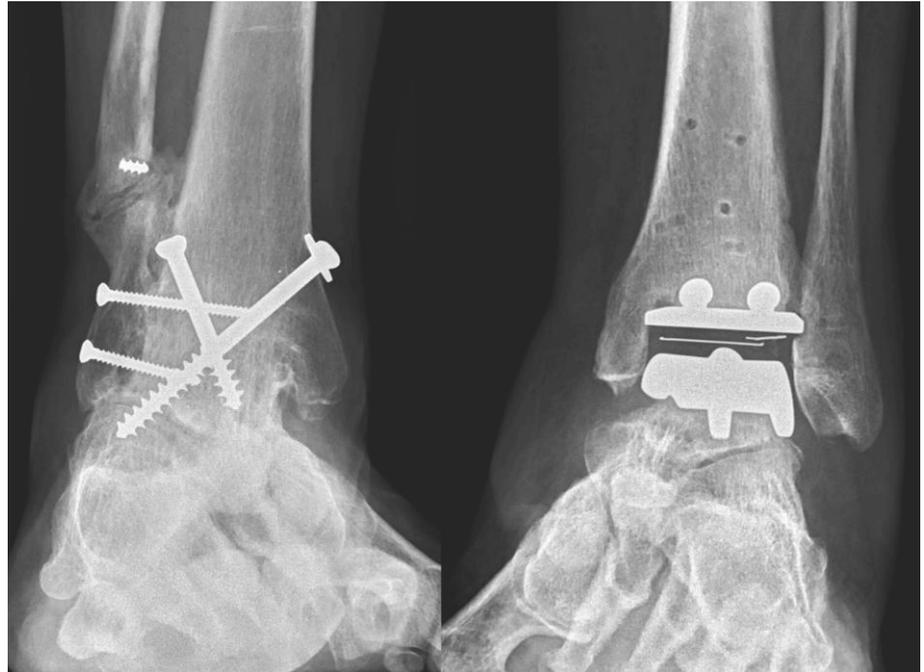


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There are still only a few studies comparing ankle fusion and total ankle replacement. The medium- to long-term outcomes are comparable as of right now. It is crucial to determine if fusion or replacement is more appropriate for each patient on an individual basis.



7 X-ray image 10 years after ankle fusion (left) and after total ankle replacement (right)



7

RISKS AND COMPLICATIONS

All surgeries carry certain risks. Complications may arise during or after surgery, potentially delaying healing or requiring further intervention. These may include:

- Wound healing issues
- Infections
- Vascular injuries, postoperative bleeding, bruising/hematoma, blood loss
- Nerve damage
- Thrombosis, pulmonary embolism
- Prosthesis loosening, inlay luxation
- Pseudarthrosis (lack of bone healing, nonunion) and loss of correction (malunion)
- Malpositioning
- Fracture
- Disturbing osteosynthesis material (screws, plate, staples)
- CRPS (Complex Regional Pain Syndrome)
- Residual discomfort



FOLLOW-UP TREATMENT

Surgery is only one part of the treatment. Proper post-operative care is crucial for a successful recovery. Upon discharge, patients receive detailed rehabilitation guidelines.

DRESSING AND WOUND CARE

Patients are instructed on proper wound care during hospitalization. Until the wound is completely dry, dressings should be changed daily, and no ointments or powders should be applied until the stitches are removed. Disinfection is not necessary. Always remove the entire dressing when changing. The new dressing must be dry and must not slip.

Once dry, a simple adhesive plaster is sufficient. An elastic bandage can protect and cushion the operated area somewhat. This also reduces the swelling that still exists. If there are concerns about wound healing, you should contact your family doctor or us directly.

Stitches are usually removed about two weeks after surgery. This is usually done by the family doctor. If you receive a cast, there is no need to change dressings. The stitches can be removed as part of a cast change. If the cast pinches or no longer sits properly, it has to be renewed.

SWELLING AND PAIN MANAGEMENT

Swelling can persist for weeks, sometimes up to twelve months. Elevating the leg is the most effective way to reduce swelling. This is especially important in the first 2-3 weeks after surgery. Short periods of getting up and moving around several times a day (walking, less standing) are recommended. If swelling and pain occur, the leg should be elevated.

However, despite these measures, pain in the operated ankle can occur in the first days and weeks after the operation. Painkillers prescribed by us or the family doctor can be taken if necessary.

WEIGHT-BEARING

In the first 2 weeks and until the wound is healed, partial weight-bearing is recommended. Then weight-bearing depends on the type of surgery. A Vacoped boot or cast (Fig. 8) must be worn, generally for the first two to six weeks, depending on the type of surgery. Initially, patients should minimize standing to avoid excessive swelling and bleeding.



- 8 Vacoped (left) and closed lower leg cast (Medicast, right)



8

Partial Weight-Bearing

Partial weight-bearing allows the foot to bear about 15-25 kg, roughly the weight of the leg itself, and requires the use of crutches at all times. Physiotherapists provide training to ensure proper crutch use, including stair navigation.

Full Weight-Bearing

Full weight-bearing is allowed once the rehabilitation plan permits and pain levels allow. Crutches should still be used initially for stability.

PERSONAL HYGIENE

While stitches are still in place, typically for the first two weeks, the foot should be covered with a plastic bag when showering. Once stitches are removed and the wound is dry and closed, exposure to water is permitted.

THROMBOSIS PROPHYLAXIS

Thrombosis prevention begins during hospitalization and depending on the surgery generally must be continued at home. In most cases, Fragmin 5000 IU injections are used once daily. Patients receive instructions on self-administration. If self-injection is difficult, oral medication such as Rivaroxaban may be an alternative after suture removal and consulting your family doctor. Depending on individual risks, prevention continues at least until full weight-bearing without a cast or boot is possible, which typically takes six to eight weeks.



WORK ABILITY

Rest is essential in the first two weeks post-surgery. The duration of work incapacity depends on the type of surgery and physical job demands. A temporary lighter-duty work arrangement may allow earlier return. The initial sick leave is an estimate, and extensions can be arranged if needed. Therefore, please contact your family doctor or us. If recovery progresses well, patients may return to work earlier.

DRIVING, TRANSPORTATION

Resumption of driving depends on the surgery type, affected foot, and vehicle transmission type. Driving is not allowed while weight-bearing is restricted or while using crutches or a Vacoped boot/cast, except for left-foot surgery with an automatic car. If in doubt, patients are advised to avoid driving.

FOLLOW-UP

A follow-up with the surgeon occurs six to eight weeks after surgery. At this stage, patients usually transition out of the Vacoped boot or cast and reduce crutch use. Continued physiotherapy is crucial. Most daily activities can resume after about three months. Return to sports should be gradual to prevent overuse injuries after the sports break. Sport-specific timelines should be discussed with your physiotherapist or doctor.

With an ankle fusion and especially a total ankle replacement, certain sports are unsuitable (especially repetitive jumping, stop & go, contact sports, skiing and snowboarding).

For the hand-drawn illustrations, we would like to thank Dr. med. Claude Müller.



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