NHS
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Trauma and Orthopaedics

Ankle and Hindfoot Osteoarthritis

This leaflet is designed to help you understand the issues related to ankle and hindfoot osteoarthritis. It is divided into sections that explain:

- What ankle/hindfoot arthritis is
- Important things you should know about
- Your treatment options
- Risks associated with surgical treatment
- Aftercare

Please note that this leaflet is not a substitute for professional medical advice. It should be used in addition to the information given by your doctor or healthcare professional.

The Ankle joint

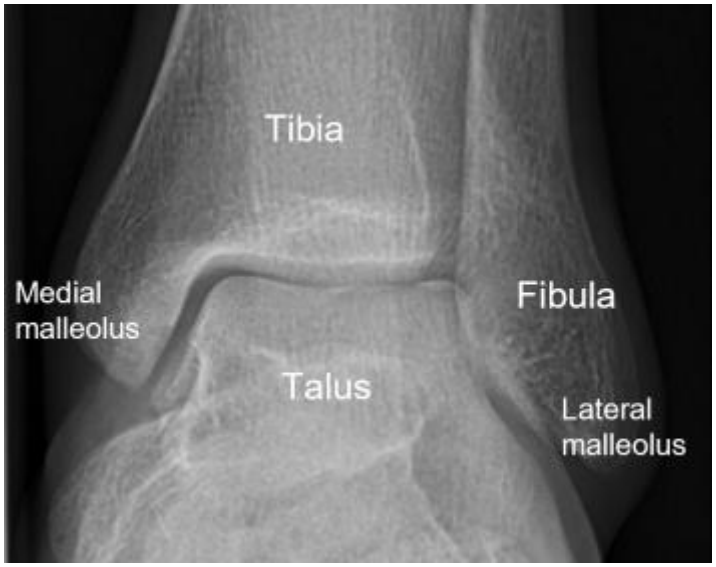
What is the ankle joint?

The ankle joint is made up of 3 bones:

- The lower part of the tibia (shinbone)
- The fibula
- The talus (ankle bone), which sits on top of the calcaneus (heel bone)

The ankle mainly moves in one direction, working like a hinge to allow your foot to move up and down.

Ligaments on both sides of the joint help hold the bones together, while tendons cross the ankle to move both the ankle and toes. Inside the joint, the bones are covered with a smooth material called articular cartilage. The cartilage allows the bones to move smoothly against one another.



"X-ray of ankle" by Mikael Häggström is licensed under CCO BY 1.0

What is ankle arthritis?

There are 2 common types of arthritis: osteoarthritis and rheumatoid arthritis.

Osteoarthritis:

This is usually caused by wear and tear of the joint. It can happen years after an injury or even without any injury. It may also be related to differences in the makeup of articular cartilage. Some individuals may be born with these differences, which can sometimes run in families (genetic).

Rheumatoid arthritis:

This is an autoimmune disease where the body's immune system becomes overactive and produces substances that damage the articular cartilage in the joint.

Symptoms of ankle arthritis

In ankle arthritis, the cartilage wears down, causing the bones to rub against each other, which leads to pain. This pain occurs at first only related to activity but later. However, as the condition gets worse, the pain can be present all the time.

Over time, extra bone growths can form and some scarring of the soft tissues can lead to stiffness. Swelling may vary depending on your level of activity. In some cases, it may become difficult to trust your ankle joint to support your body weight in certain positions.

Diagnosis of ankle arthritis

To diagnose ankle arthritis, X-rays of the affected ankle are required to look at the severity of the arthritis in the joint. In some cases, it may be necessary to carry out more tests and investigations to identify a specific area of pain. The surgeon may recommend a CT scan (computerised tomography), an MRI scan (magnetic resonance image) or X-ray guided injections into one or more joints.

The injections are used to assess how numbing a specific joint affects your pain. Afterward, you may be asked to keep a ‘pain diary’ to track your symptoms.

In some cases, your doctor may also order blood tests to check for conditions such as rheumatoid arthritis or gout.

Treatment options

Non-surgical treatment options should always be tried before considering an operation.

A) Non-surgical treatment

- **Pain killers:** Medicines such as paracetamol or ibuprofen can help manage pain.
- **Steroid joint injections:** These injections can help with diagnosis and provide temporary pain relief. The steroid’s effect lasts for up to 8 weeks but your pain relief may last longer or shorter.
- **Activity restriction:** Limiting activities such as long walks or running may be necessary to manage symptoms.
- **Orthoses (ankle braces or insoles):** These can help limit joint movement and provide support.

- **Footwear adjustments:** Shoes with cushioning, rocker bottoms or boots that lace up above the ankle can provide support and reduce stress on the arthritic joint.
- **Walking aids:** Crutches or a walking stick can reduce stress on the arthritic joint by redistributing weight.
- **Injectable medications**: These lubricate the arthritic joint and are mainly studied for the knee. However, their benefits for the arthritic ankle joint remain unclear.

Herbal remedies

There is no evidence that “herbal remedies,” glucosamine or chondroitin reduce pain in foot and ankle arthritis. However, some patients choose to try these remedies.

B) Surgical treatment

If non-surgical treatments do not provide relief, surgery may be an option.

The 3 main surgical choices are:

1-Arthroscopic Debridement (keyhole) surgery to ‘clean up’ the joint

This key-hole surgery aims to clean the joint by removing loose cartilage and bony spurs. It may improve pain and delay the need for fusion or replacement surgery. However, pain relief and how long it lasts would depend on the severity of arthritis and in some cases, the procedure may make your ankle pain worse.

2- Joint fusion (stiffening) (open or keyhole)

An Arthrodesis or fusion is a procedure used to permanently fix a joint in the foot or ankle that has severe arthritis or deformity. During the operation, the damaged joint surfaces are removed and screws or other metalwork are inserted to hold the bones in place while they heal. Over time, new bone grows across the joint, making it solid.

The aim of this operation is to turn an often stiff, painful joint into a stiff, pain-free joint.

3- Joint replacement with an artificial ankle joint.

The best option depends on the severity of arthritis, deformity, arthritis in other foot and ankle joints, activity level and overall health.

Replacement or fusion - which procedure to choose?

When comparing Ankle fusion and Total Ankle replacement it has been shown in recent studies that in adults aged between 50-85 with end stage ankle arthritis, there is no significant difference in patient reported outcomes at 1 or 2 years and both procedures significantly improved activities of daily living. However, we are awaiting long term data on the newest, current 4th generation ankle replacement. Therefore, in line with national guidance, we offer both options ankle replacement and fusion.

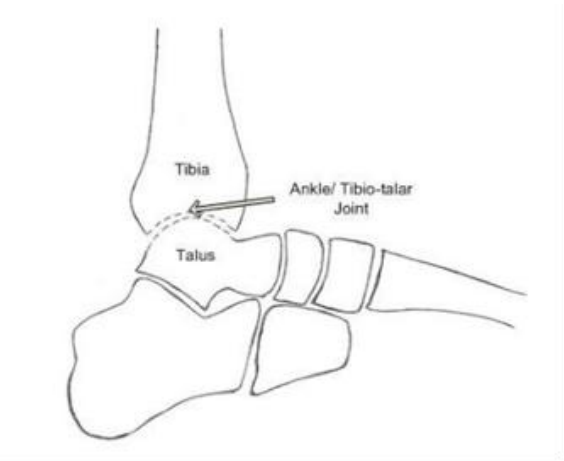
There are other factors that may influence the final decision after discussion with your orthopaedic surgeon / team.

More detail is provided in the individual sections below.

Ankle Arthrodesis (Fusion)

Ankle fusion is the most common surgical treatment for arthritis. It is often the best option for younger, more active people and has a success rate of around 9 out of 10 cases.

The diagram below shows the joint involved in this procedure.



How is a fusion carried out?

There are 2 ways to carry out a fusion:

1. Open surgery - using cuts (incisions) to see the joint directly.
2. Keyhole surgery – using small cuts and a camera to see the joint.

The decision depends on which joint needs fusing, how severe the deformity and the condition of the skin. Your surgeon will explain whether you will have keyhole or open surgery.

During the procedure, the damaged joint surfaces are removed. If needed, the bone may be reshaped to correct any deformity. The joint is then put into the correct position and fixed in place using screws, or sometimes plate and screws.

If extra bone is needed, a bone graft may be used. This can come from bone already removed during the procedure or taken from another area on the patient, such as pelvis or shin bone. To minimise the surgical insult of harvesting bone from the patient we often use bone tissue harvested and heavily processed from donor patients. The risk of blood borne virus transmission from this type of bone graft is extremely low.

After surgery, your ankle will be protected in a plaster cast. You may not be able to put weight on it for 2 to 3 months, giving the bones time to heal. You may require further time spent in a plaster/boot for up to 6 months.

The operation is usually done under a general anaesthetic (where you are asleep), or spinal anaesthetic (an injection into your back that numbs your legs).

A nerve block is often used to help with pain after the surgery. Your anaesthetist will discuss the best option for you.

Even after the fusion, you will still have some up and down movement in your foot, keeping about 3 to 4 out of 10 of your foot's movement, as the other joints in the foot stay mobile

Once the ankle is successfully fused, it can last for a lifetime and no other operations are usually required, unless there are problems such as prominent metalwork or problems with bone healing. Most people with a successful fusion are able to walk without much trouble, but they will find it difficult to run.

Since fusion stiffens the ankle, it can increase stress on nearby joints, such as the foot and knee, increasing the risk of arthritis in these areas over time. If the surrounding joints are already arthritic, it may worsen symptoms in those joints as they will be under more stress and load once the ankle has been fused.

Total Ankle Replacement

This surgery involves replacing the worn-out ankle joint with an artificial joint with a metal implant and a plastic spacer.

Joint mobility is preserved in an ankle replacement but if an ankle replacement fails, it can leave a significant bone defect, which may require a complex revision replacement or fusion at a later date.

Who is suitable for ankle replacement?

If preserving joint movement is important to you, and/or you have lower activity demands, ankle replacement may be an option, especially if you have arthritis affecting multiple foot and ankle joints. Older, less active patients may benefit from ankle replacement as an alternative to fusion

However, not all patients with ankle arthritis are suitable for this surgery.

Below are some reasons why a total ankle replacement may not be an option:

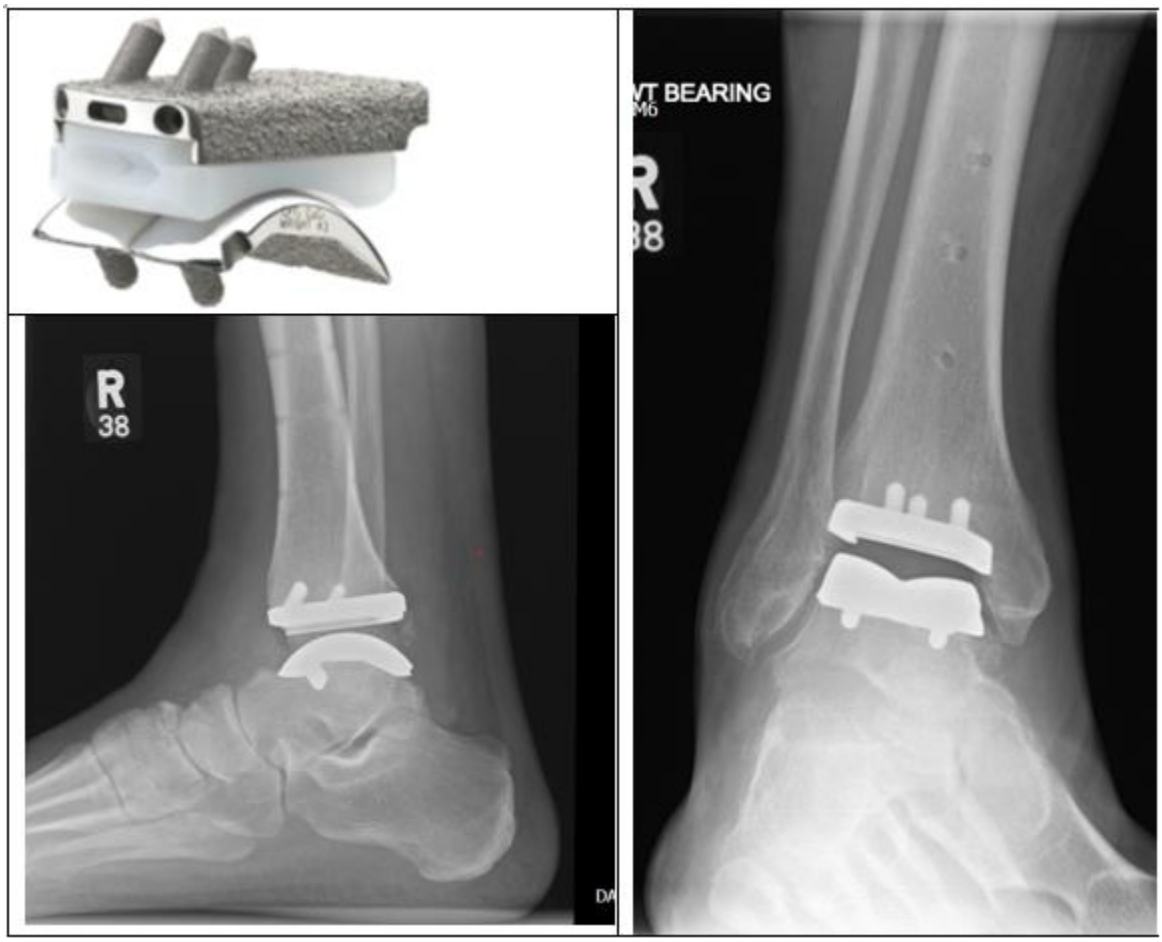
- If the soft tissues /skin are in poor condition.
- If ankle ligaments are damaged or lax or there is a severe deformity of the ankle.
- Any history of infection.
- Poor circulation / smoking.

The procedure

The ankle joint (tibiotalar joint) is where the shin bone (tibia) meets the top of the foot bone (talus).

- A cut is made at the front of your ankle to access the joint.
- Using special instruments, the surgeon makes precise cuts to remove the damaged joint surfaces.
- Metal components are then fitted to the bottom of the shin bone and the top of the foot bone (talus).
- A plastic spacer is placed between the metal parts to allow smooth movements.

Sometimes, extra procedures are needed, such as adjusting the bones or soft tissues to balance the foot to ensure the foot is flat on the ground whilst walking/standing. This helps improve the long-terms success of the ankle replacement



Permisison has been received from Stryker Corporation to use the image.

Ankle replacement is less common and doesn't have a long track record as hip or knee replacement, Ankle replacement design is still evolving to accommodate the complex nature of the ankle and foot joints.

Current research shows that around 9 out of 10 ankle replacements last at least 5 years and between 8/10 -9/10 last 10 years. However, very few patients may need further procedures during the first year, including revision surgery if the replacement fails early.

Younger, more active patients have a higher risk of early failure.

The National joint registry, which tracks thousands of patients, reports that about 6 out of every 100 ankle replacement patients need another surgery within the first year. This includes cases of early failure and full revision of the replacement.

The most common ankle replacement in the United Kingdom has been widely used since 2016. Early results are promising compared to older designs, but long-term data is not yet available.

Specific recovery for ankle replacement

After your operation, the foot and ankle will be placed in a back slab (half a plaster) from the knee to the toes. This should remain in place until your next outpatient appointment, usually 2 weeks after surgery at a nurse-led clinic.

After this, you would be provided with a boot for 2 to 4 weeks, during which you will be able to mobilise fully weight-bearing and slowly wean off the boot. You can intermittently remove the boot and start moving the ankle up and down. However, if you had additional procedures with ankle replacement to balance the foot, the additional procedures will dictate the post operative rehabilitation which is individual to each patient.

A check X-ray will be taken at 6 weeks to make sure the position of the ankle prosthesis is correct and to rule out any stress fractures.

You will have follow-up appointments in 6 months and every year thereafter to make sure the position of ankle prosthesis and check for any signs of failure.

You could resume routine activities as comfort allows from the third week of surgery. However, physically demanding activities may take 3 to 4 months before they are comfortable to do.

The Hindfoot

The hindfoot is made up of three separate joints- the Subtalar, Calcaneocuboid and Talonavicular joint.

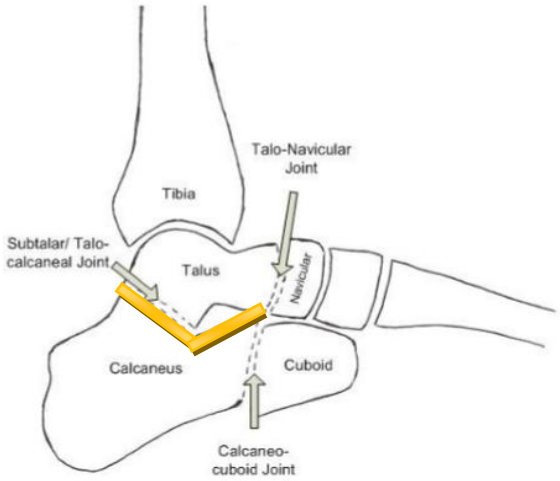
These joints can become symptomatic from arthritis the same way that the Ankle joint can be. They can be affected individually or in some cases multiple joints can be involved. Depending on which joints are involved they are operated on individually, or in some cases together.

At this time there are no replacements available for the Hindfoot joints. The only surgical option for arthritis of these joints is fusion.

The Subtalar joint

What is the Subtalar joint?

The subtalar joint is the joint made up between the bottom of the ankle bone (talus) and the top of the heel bone (calcaneus)



Surgical options for the subtalar joint

At this time there are no replacements available for the Sub talar joint. The only surgical option for arthritis of this joint is fusion.

Subtalar joint fusion

The process for Subtalar joint fusion is the same as for the ankle.

The damaged joint surfaces are removed/prepared and screws or other metalwork are inserted to hold the bones in place while they heal. Over time, new bone grows across the joint, making it solid.

Hindfoot Fusion

Tibiotalarcalcaneal fusion (TTC)

If both the ankle and subtalar joints have arthritis and both are causing significant pain a procedure called tibiotalocalcaneal (or hindfoot) fusion may be needed.

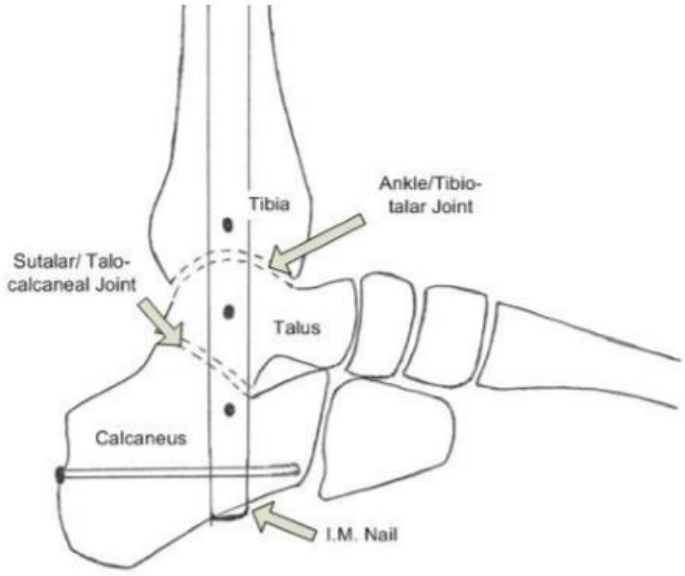
This operation fuses the shin bone (tibia) to the ankle and heel bone (talus and calcaneum). This means that both the ankle and subtalar joints are fused at the same time.

The bones are usually fixed together using a large metal rod (intramedullay nail) inserted into the middle of the shin bone or with plates and screws. The nail is placed through a small cut in the bottom of the heel and screws are used to secure it to the shin bone and foot bones. The main scar for this surgery will be on the outside of the ankle but there may be other cuts.

This is a major operation used to treat severe arthritis or major deformity. After surgery, you will lose most of the up and down and side to side movement of the foot.

Patient Information

The diagram below shows the joints that are fused (marked with dotted lines) and the position of the metal nail.



Triple joint Arthrodesis (Fusion)

The triple joint is a name used to refer the Subtalar joint, Talonavicular joint and Calcaneo cuboid joint together.

The Talonavicular joint is formed between the ankle bone (Talus) and one of the inner mid foot bones (Navicular).

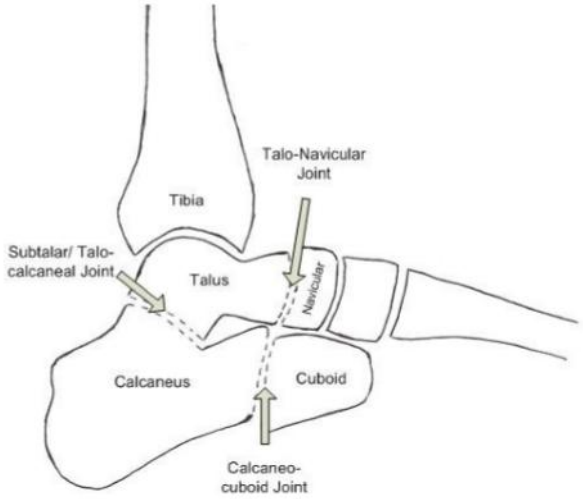
The Calcaneocuboid joint is formed between the Calcaneus (heel bone) and Cuboid (one of the outer midfoot bones)

In some cases, all three joints are arthritic and cause pain.

If this happens, your surgeon may recommend fusing all three of these joints at the same time.

A **triple arthrodesis (fusion)** is a procedure that fuses these 3 specific joints. These joints normally allow side-to-side movement, so fusing them will take away almost all the side-to-side movement.

The diagram below shows the joints that are fused, marked with dotted lines. This operation is done to correct deformity, relieve pain and improve function. However, it is important to understand that these joints are often already very stiff due to arthritis.



Bone Grafts

Sometimes, a bone graft is needed, particularly if a deformity needs to be corrected. This may come from:

- Bone already removed during surgery (the fibula)
- The pelvis or top of the shin bone (tibia)
- Bone tissue harvested and heavily processed from donor patients

Post-operative advice

Length of Hospital stay

The length of your hospital stay will vary depending on your individual recovery. You will stay until your medical condition has stabilised and you are able to safely use crutches or a walker. A physiotherapist will assess you and provide instruction on how to use crutches safely.

Elevation

It is very important to keep the foot that has been operated on raised above the level of your groin as much as possible for the first 2 weeks after your surgery.

For the first 2 days after your surgery, your foot should be raised for 55 minutes every hour. Each day, the time spent raising your foot can be

reduced by 5 minutes per hour based on your comfort (50 minutes on day 3, 45 minutes on day 4 etc). This should help reduce swelling, manage pain and promote better wound healing.

Analgesia

Painkillers are recommended to be taken regularly during the first week after surgery. These will be provided to you before you leave hospital. We recommend you avoid taking non steroidal anti inflammatory medications (NSAIDs) like Ibuprofen, naproxen or voltarol.

Bleeding

It is possible that the wounds may bleed after surgery. If this happens, please contact the foot and ankle team looking after you (not your GP), and they will arrange for you to return to the clinic for a wound assessment. If this happens in the evening or on the weekend, please attend the accident and emergency (A&E) department. This advice applies to any post operative concern you may have. You should have received the card with contact details for the foot and ankle team; the numbers are also at the end of this document.

Scarring

All surgeries result in scarring, and these can sometimes be sensitive. It is recommended to massage the scar with E45 cream or bio-oil starting 3 weeks after surgery once the wounds have healed, to help with healing and reduce sensitivity.

Follow up appointments

After your operation, your foot and ankle will be placed in a back slab (half plaster) from the knee to the toes. This should remain in place until your next outpatient appointment, which is usually 2 weeks after surgery at a nurse-led clinic.

You will be in a plaster cast or boot for around 12 to 16 weeks after the fusion of your joints:

- First 2 weeks: You will be non-weight bearing, meaning you should not put any weight through the operated limb.

- Weight-bearing restrictions: Depending on the specific joint fused and the stability of fixation, weight-bearing restrictions may vary. This can range from 2 weeks to 3 months. Your surgeon will give you more information on this.

A check X-ray will be taken at 8 weeks and 4 months after the fusion to make sure the correct position and monitor the progress of union/fusion.

During this time, you will probably need to use crutches for most of the time you wear the cast. As the fusion heals and becomes stronger, you will slowly begin to put more weight on your foot, and you will start walking and wean off from the plaster cast or boot.

Returning to work

This depends on your individual circumstances and the type of your employment. If you have an office-based or sedentary job and there are provisions for you to raise the ankle operated, you may be able to return to work 4 weeks after surgery. However, if your job is physically demanding or involves long periods on your feet, it is advisable to refrain from work for up to 6 months to allow enough time for recovery and healing.

Driving

- If surgery is carried out on your **left foot** and you drive an automatic car, you may be able to start driving around 4 weeks after the operation.
- If the surgery is on the **right foot** or if you drive a **manual car**, you may need to wait 3 to 4 months before driving.
- Before driving, it is important to do a test drive to make sure you can perform an emergency stop safely.
- You should also notify your insurance company **before driving** about the type of procedure that you have undergone to make sure your cover remains valid.

Sport

- After the plaster cast is removed, you can slowly start returning to exercise.
- Walking on uneven ground may still be difficult, especially after a hind foot fusion or triple fusion, as the foot will be stiffer than before.
- However, because you are now pain-free, you will likely find it more comfortable to walk reasonable distances on flat surfaces, slopes, stairs and to cycle.
- Vigorous sports such as football, rugby or squash are unlikely to be possible due to the reduced mobility in the foot.

Smoking advice

It is important to stop smoking for at least 6 weeks before your operation and up to 4 months afterwards. Evidence shows that people who smoke take longer for their bone to heal. If you smoke, you are 5 times more likely to develop non-union (when the bone does not heal properly). You can get help to quit smoking from your GP or a Smoking Helpline.

Possible complications of surgery

Delayed wound healing

The foot and ankle often have a reduced blood supply, which can slow down healing. If this happens, more frequent wound dressings may be needed. Slow healing can also increase the risk of infection.

Total ankle replacement has higher wound healing issues with 13% or (13/100 people) Vs ankle fusion at 5 % (5/100 people)

Infection

Minor infections are uncommon and normally clear up with a short course of antibiotics. Deep infections happen in less than 1 in 100 patients and may require further surgery, prolonged antibiotics and possibly removal of the metalwork/ prosthesis.

Numbness and tingling

Some patients experience numbness or tingling around the wound because of minor nerve damage. This often improves over time but may occasionally be permanent.

Malunion (incorrect bone healing)

The bones may not heal in the exact position intended. This could be due to the position not being fully corrected during surgery or the bones shifting while in a plaster cast. In most cases, this does not cause major problems, but in some instances, further surgery may be needed to correct the alignment.

Non-union (failure of bones to fuse)

Research shows that in 5 to 10 out of 100 cases, the bones fail to unite (not join).

If you smoke the risk of non-union or major complications is greatly increased. **It is important to stop smoking before surgery and continue to avoid it until the bones have fully healed.** You will be advised against a fusion if you smoke.

Prominent metalwork

In some cases, screws or other metalwork may become prominent and cause discomfort. If this happens, a minor procedure may be needed to remove them.

Blood clots

The risk of Deep vein thrombosis (DVT) or pulmonary embolism (PE) is low but possible. All patients will have a risk assessment before surgery. Preventive blood-thinning injections are usually given, but despite this, a small risk remains.

Damage to major nerves and blood vessels

In rare cases, major nerves or blood vessels may be damaged during surgery. If this happens, further surgery may be needed either immediately or at a later date.

Nerve injury in TAR is 4% (4/100 people) and 1% in AF (1/100 people)

Chronic Regional Pain Syndrome (CRPS)

A small number of patients may develop CRPS, a long-term condition causing severe pain, swelling and skin changes. Symptoms persist beyond the usual healing period. CRPS is managed with physiotherapy and pain relief medicines.

Specific complications of ankle replacement

Malalignment of prosthesis

Incorrect positioning of the implant can lead to early failure. It may also cause abnormal stress on the bones, increasing the risk of complications.

Stress fracture

Fractures could happen during surgery or within the first 6 months after the operation. These fractures usually develop on the inner side of the ankle. They may cause ongoing pain, especially during weight-bearing activities. However, most patients won't require further intervention.

Early loosening (with or without bone cysts)

Increased stress at the bone implant interface may cause the prosthesis to loosen. This can lead to early failure of the implant. Bone cysts (fluid-filled sacs) may form, weakening the surrounding bone.

Further information can be found at the British Orthopaedic website link below:

Speciality Standards (SpecS) - Management of End Stage Ankle Arthritis

Contact details

If you have any questions or concerns, please contact the following.

Consultants secretary (Monday – Friday, 8am – 4:30pm)

- Mr Dhukaram – Jas Virdi: 02476 965 095
- Mrs Chapman – Amber Jolliffe 02476 967 117
- Mr Ali – Claire Merrall: 02476 965 073

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