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Ankle and hindfoot fusion

What is the ankle joint?

The ankle joint is made up of three bones: the lower end of the tibia (shinbone), the fibula and the talus. The talus sits on top of the calcaneus (the heel bone). The ankle 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. Inside the joint, the bones are covered with a slick material called articular cartilage. The cartilage allows the bones to move smoothly against one another.



Types of ankle arthritis?

There are two common types of arthritis: **osteoarthritis** and **rheumatoid** arthritis.

- Osteoarthritis is usually caused by wear and tear of the joint. It can occur years after an injury or without any injury. It may be related to differences in the makeup of articular cartilage. Some individuals are born with these differences.
- Rheumatoid arthritis is a disease caused by inflammation of the joint. The body's immune system is overactive producing substances that damage the articular cartilage.

Symptoms

In arthritis the cartilage is worn and the bone starts to rub on bare bone causing pain. This pain occurs (at first) only related to activity but later, when the condition worsens the pain may be present all the time. Extra bits of bone can form and some scarring of the soft tissues lead to stiffness. Swelling is variable depending on your activity. Sometimes it can become difficult to trust your ankle joint to hold your body weight in certain positions.

How is ankle arthritis diagnosed?

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

The injections are carried out to assess what effect numbing of one specific joint has on your pain. Following this you will be asked to keep a 'pain diary'.

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

Treatment

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

Non surgical treatment

- Painkillers e.g. paracetamol, ibuprofen
- Steroid joint injection: this can be used to help with diagnosis and also given some temporary pain relief. Steroid drug effect is only for 8 weeks but your pain relief could be for a longer or shorter period.

- Restriction of activity: avoiding long walks or running may be necessary
- Orthoses (ankle braces or insoles) to limit the movement of the joint.
- Footwear adjustment e.g. shoes with cushioning, rocker bottom, boots that lace up above the ankle aim to provide support and reduce the stress on arthritic joint.
- Walking aids e.g. crutches or a walking stick aim to reduce the stress on the arthritic joint
- Injectable medications that lubricate the arthritic joint. These medications have been studied mainly in the knee with no clear benefit. It is unclear if they will help the arthritic ankle joint.

There is no evidence that “herbal remedies” such as glucosamine or chondroitin reduce pain in foot and ankle arthritis but some patients like to try such remedies.

Surgical treatment

If you do not get relief with the treatment above surgery can be considered.

The choices are arthroscopic surgery to clean up the joint, fusion of the joint open/arthroscopic guided or replacing the joint with an artificial ankle joint. The choice depends on the severity of arthritis, deformity, your functional activity and medical comorbidities

Arthroscopic Debridement: This keyhole surgery aims to clean up the joint removing loose cartilage flaps and bony spurs. This may improve the pain and delay any later surgery like joint fusion or replacement. The degree of pain relief and the time period it lasts would depend on the severity of arthritis. However, there is a risk, this procedure may make your ankle pain worse.

Joint replacement: Ankle replacement doesn't have a long track record and is not as successful as hip or knee replacement. Current research shows the 5 year survival rate of ankle replacement is 80 to 90%. The more young and active you are, the higher the risk of early failure. Older patients who are less active may consider an ankle

replacement as an alternative to a fusion. Joint mobility is preserved in an ankle replacement. A failed ankle replacement is usually treated by ankle fusion but a revision to another ankle replacement can occasionally be considered. Severely deformed ankles are not suitable for replacement surgery.

Ankle fusion: It is the most common surgical treatment for ankle arthritis. It is a better choice for young and active people. Once the ankle is successfully fused it can last for lifetime and no other operations are needed unless there are problems. Most people with a successful fusion of the ankle are able to walk without much trouble; however they will find it difficult to run. A fusion stiffens up the ankle joint so this could transfer stress to other foot joints and the knee increasing the risk of arthritis of these joints.

Ankle fusion

The ankle (tibiotalar joint) - is the joint between the shin bone (tibia) and the uppermost bone of the foot, the talus. This operation involves fusing the tibia (shin bone) and talus. It has a 90% success rate. An Arthrodesis or fusion is an operation performed to 'fix' a joint or joints in the foot and ankle that is affected by severe arthritis or to correct deformity.

Triple fusion

Sometimes the arthritis affects the joints around your ankle. If this is the cause your surgeon may recommend fusing more than one joint. A 'triple arthrodesis' refers to a surgical procedure that fuses three joints. These three joints allow side to side movement. Fusing them will take away almost all the side to side movement. Again this operation is designed to correct the deformity, relieve pain and improve function. However, it is important to understand, these joints are often already very stiff when affected by arthritis.

Hindfoot fusion

Sometimes, a procedure called a tibiotalocalcaneal fusion may be indicated. If you have a tibiotalocalcaneal fusion this fuses the shin bone (tibia) to the main bones in the back of the foot (talus and calcaneus). The bones are usually fixed together using a large metal nail inserted into the middle of the shin bone or plate and screws. The nail is inserted through a cut in the bottom of the heel; screws are passed through the nail to

prevent it from moving within the bone. The main scar for this surgery will be on the outside of the ankle. A tibiototalcalcaneal fusion is a major operation that is carried out to treat severe arthritis or major deformity. This surgery will take away most of your up and down as well as the side to side movement of the foot.

Complications following surgery

- Delayed wound healing

The blood supply of the foot and ankle may not be so good where wounds are slow to heal. If this is the case more frequent wound dressings may be required. Delayed wound healing may cause wound infection.

- Infection

This occurs in a small percentage of patients. Minor infections normally settle after a short course of antibiotics. Deep infection is less than 1% and will require further surgery to resolve the infection along with prolonged antibiotics. It may also require removal of the metalwork to resolve the infection.

- Numbness and tingling

This can occur around the wound as a result of minor nerve damage. Numbness or sensitive areas are usually settled but occasionally this may be permanent.

- Malunion

The bones may not heal/fusion in the exact position intended. This may be either the position was not achieved at the time of surgery or the bones have shifted while in plaster. This does not usually cause any major problems. Occasionally further surgery required to correct the mal-position.

- Non union

Research evidence shows that 5-10% of the bones fail to unite (not join). **If you smoke the risk of nonunion or major complications is greatly increased. It is essential that you stop smoking before surgery and refrain from smoking until all bones have healed.** You will be advised against a fusion if you smoke.

- Prominent metalwork

Occasionally screws may remain prominent and need removal.

- Blood clots

Deep vein thrombosis (DVT) or pulmonary embolism (PE) is rare. All patients will undergo a risk assessment for their chance of developing a blood clot and preventive

injections are usually given. In spite of the preventive injections you have a small risk of developing the blood clot.

- Damage to major nerves and vessels

Damage to major nerves and vessels may require further surgery immediately or at a later date. But the risk is small.

- Chronic Regional Pain Syndrome (CRPS)

A small number of patients may experience CRPS. This is a chronic condition characterised by severe pain, swelling and changes to the skin which persist beyond the first few weeks following surgery. This is treated with physiotherapy and pain killers.

Post operative Advice

Length of Hospital stay

The amount of time you spend in the hospital varies. You will need to stay until your medical condition has stabilised and you can safely use crutches or a walker. Physiotherapists will assess you and instruct on the safe use of crutches.

Elevation

It is extremely important to keep the foot which has been operated on elevated above groin level as much as possible for the first two weeks after your operation.

For two days after your surgery your foot needs to be raised 55 minutes out of every hour. The duration of the elevation is reduced by 5 minutes per hour every day (e.g. 50 minutes on day 3, 45 minutes on day 4 etc). This should help to reduce the foot swelling, pain and better wound healing.

Analgesia

Painkillers are recommended to be taken regularly during the first week of surgery. These will be supplied to you before you leave hospital

Bleeding

Sometimes after the surgery the wounds can bleed. If this occurs please contact the team (not your GP) looking after you and they will invite you back to clinic for a wound assessment. If this occurs at the evening or weekend please attend the accident and emergency department if you are concerned.

Scarring

All surgery will leave a scar, these can sometimes be sensitive. It is recommended to massage the scar with E45 cream or bio oil from three weeks after surgery.

Follow up appointments

After your operation the foot and ankle will be 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. .

You will be in a plaster cast/ boot for approximately 12 to 16 weeks following the fusion of your joints:

- The first 2 weeks following the fusion will be non weight bearing. You are not allowed to put any weight through the operated limb.
- Depending on which particular joint fused and the stability of fixation, weight-bearing restrictions vary from a period of 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 following the fusion. This is done to ensure the position and progress of union/fusion. 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 and wean off from the plaster cast/boot.

Returning to work

This depends on your individual circumstances and on the type of your employment. If you have an office or sedentary type job and there are provisions for you to elevate the ankle operated on then you may resume work 4 weeks following surgery. However, if your employment is physically demanding and usually involves long periods on your feet then it is advisable to refrain from work for up to 6 months.

Driving

If surgery is undertaken on your left foot and have an automatic car, you can start driving at around 4 weeks following the operation. Otherwise, you may be able to drive from 3 to 4 months after surgery. You need to do a test drive to ensure you can perform an emergency stop. You should notify your insurance company the type of procedure that you have undergone to ensure your cover is valid.

Sport

Following the removal of the plaster cast you may start to gradually return to exercise. Walking on uneven ground will still be difficult following a hind foot fusion or triple fusion. The foot will obviously be stiffer than before. However, due to the fact that you are now pain free you will find that you are more comfortably able to walk a reasonable distance on the flat, slopes, stairs, drive and cycle. You are unlikely to return to vigorous sports such as football, rugby squash etc.