PATIENT INFORMATION FILE:

ANKLE FRACTURE
FRACTURE OF THE NECK OF THE FOOT

Your surgeon has suggested surgical treatment for your ankle instability.

He or she has explained the general points about this treatment: alternatives, procedure, postoperative course, expected results, and also the main possible complications. This file is a supplement provided as a reminder of the key points regarding your pathology, enabling you to check out the important aspects of the coming operation.

Your surgeon is also available before the operation to answer any further questions you may have.

File produced by the medico-legal commission of the French Foot and Ankle Surgery Association (AFCP)

File available on-line at the following websites:
AFCP (https://www.afcp.com.fr/infos-publiques/infos-patients/)
SOFCOT (http://www.sofcot.fr/Infos-public-Patients)
ORTHORISQ (http://www.orthorisq.fr)

You have fractured your ankle. This may involve the lateral ("peroneal" or "fibular") malleolus, medial malleolus (medial distal part of the tibia), central distal part of the tibia known as the "tibial pilon", or both malleoli ("bimalleolar fracture"). These different fractures can also be associated in various ways.

ANATOMY

The ankle is the joint between the foreleg and the foot. It is an essential joint, both for weight-bearing, on and adapted to the ground, and for walking.

The bones composing the ankle comprise:

-the lower end of the tibia;
-the lower end of the fibula;
-and the talus ("ankle bone").

The joint is held in place by a fibrous sleeve, called the "joint capsule", reinforced by ligaments, particularly on the lateral and medial sides, ensuring stability.
Ankle motion consists mainly in plantar flexion (with the tip of the foot down) and dorsiflexion or extension (with the tip of the foot up), and, to a lesser extent, medial ("varus") and lateral ("valgus") inclination.

Around the joint, there pass tendons that are important for foot function and stability:

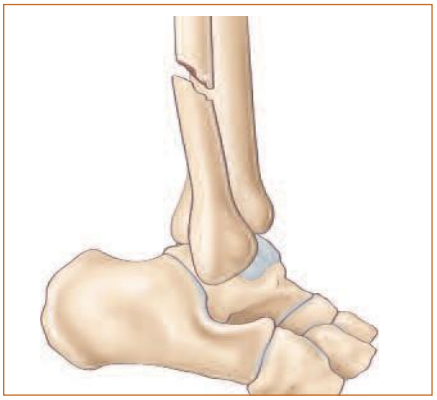
-in front: extensor tendons, enabling motion of the ankle, midfoot and even toes;
-behind: flexor tendons, enabling ankle propulsion and also flexion of the midfoot and toes.

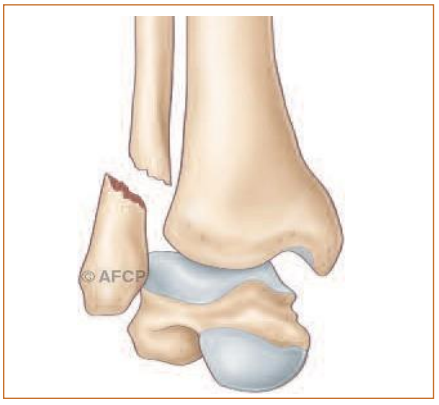
Both in front and behind the ankle joint, there are also:

-nerves, allowing motor command of the muscles and sensitivity in ankle and foot as a whole;
-arteries and veins, providing vascularization from the ankle down to the toes.

FRACTURE

Fractures of the "neck of the foot" comprise both malleolar fractures (of just one malleolus) and bimalleolar fractures (involving both), and tibial pilon fractures. More than one such fracture may be combined, sometimes along with ligament lesions or dislocation (where the joint surfaces are no longer facing one another).
Malleolar fracture may be isolated or associated with ligament lesion: fibular (lateral) malleolar fracture may be associated with a lesion of the medial collateral ligament (which inserts on the tibial malleolus); tibial malleolar fracture may be associated with a fracture of the proximal part of the fibula.
Fracture of the central part of the tibia (tibial pilon) is often complex and "comminuted" (i.e., with several bone fragments). This can induce severe cartilage lesions; this type of fracture in particular can lead, sooner or later, to osteoarthritis.





DIAGNOSIS

After trauma, the ankle is painful and may be quickly become deformed by a swelling known as “edema”. The edema is often large, and walking becomes difficult or impossible.
Skin lesions are frequent and may expose the bone (“open fracture”), with risk of infection, aggravating secondary osteoarthritis.
Diagnosis is confirmed on X-ray work-up, which may include several different views so as better to assess fragment displacement. In some cases, a CT scan may be needed to establish exactly what kind of fracture you have sustained.

TREATMENTS

ORTHOPEDIC (NON-SURGICAL) TREATMENT

Orthopedic treatment is based on plaster-cast immobilization of the foreleg, and can be used to treat certain fractures where there has been no displacement.

SURGICAL TREATMENT (OPERATIONS)

> HOSPITAL ADMISSION

Admission may be for just the day (outpatient surgery) or for a few days, depending on your individual characteristics (age, associated pathologies, any important medical treatments, home-to-hospital distance, social isolation, etc.) and above all on the type of fracture and the type of treatment your surgeon advises.

> ANESTHESIA

Even in emergency situations, there is always a preoperative consultation with an anesthesiologist, who will explain the types of anesthesia adapted to your operation and your state of health.
In this consultation, he or she will also ask about any medication you are taking. New treatments may be started, either before or after surgery. The most frequent are anticoagulants, antibiotics (in case of open fracture, for example), analgesics and anti-inflammatories; each, of course, has its own specific risks.
Anesthesia for surgery may be: locoregional, in just one part of the limb, from foreleg to toes; spinal, in pelvis and limbs, with an injection between two vertebrae; or general.
Blood transfusion may be necessary after surgery. Blood loss is not usually great, but certain situations require an input of red blood cells: preoperative anemia, coagulation disorder, or ongoing anticoagulant or antiplatelet treatment.

TECHNIQUES

> POSITIONING IN THE OPERATING ROOM

In the operating room, you will be positioned on your back, sometimes leaning slightly toward the side opposite the operation.

When you go to the operating room, do not be surprised if you are asked more than once for your identity, and the side to be operated on (on arrival, and again when you are being positioned on the table): this “security check-list” is mandatory, under French Health Authority regulations, for all patients.

> SURGERY TIME

The operation can take between 30 minutes and more than 2 hours, depending on the type and complexity of the fracture, the surgical technique, any difficulties encountered and any associated procedures.

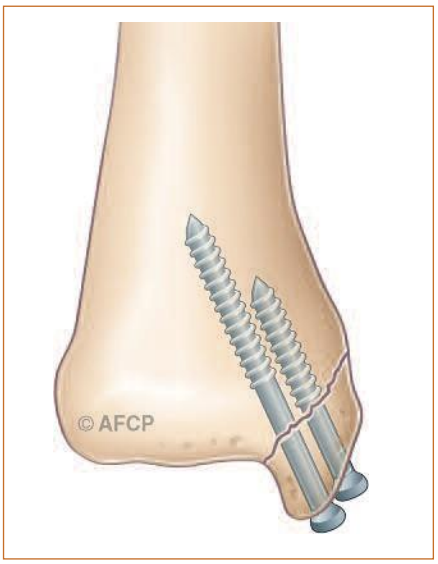
> TOURNIQUET

A tourniquet, applied to the thigh, may be used to temporarily cut off blood flow into the operative area.

> INCISIONS

The surgical incision may be 15 or so centimeters (about 6 inches) long, or point-sized incisions, depending on the surgical technique:
-conventional, “open” surgery, with the operation carried out under visual control;
-or percutaneous surgery, using incisions just a few millimeters long and specific instruments, usually under radioscopic control.
The incisions may be made on the front of the ankle or on the sides. There can be several incisions (often 2), depending on the type of fracture.

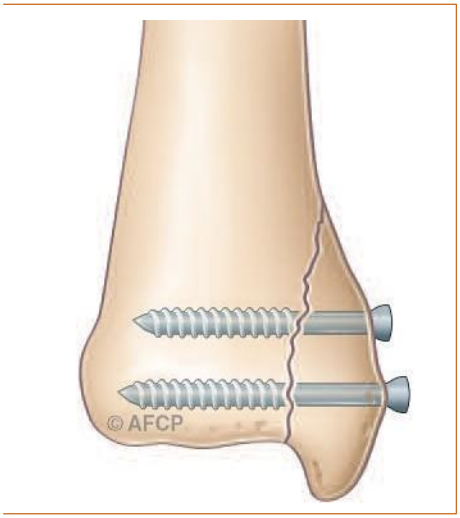
> SURGICAL TECHNIQUES ARE MANY AND VARIOUS



The aim is to reposition the bone fragments and ligaments as anatomically as possible, fixing them with surgical hardware. There are various fixation methods: screws, plates, pins, staples, suture or cerclage; sometimes, an external fixator is used. These various possibilities can be combined.
In some cases, a temporary screw is needed between the tibia and fibula, known as a "syndesmodesis screw", to be removed in a second operation at 6 to 8 weeks, whereas other hardware can be left for several months. The hardware sometimes gives rise to residual pain, needing removal some months after bone consolidation.

Your ankle may be immobilized by a removable or fixed splint, or a resin or plaster boot cast. Immobilization usually last 45 days, but varies between 3 weeks and 4 months depending on the type of fracture. Depending on the type of fracture, the solidity of the assembly, your age and weight and your surgeon's habits, weight-bearing is or is not authorized.
Depending on the type of immobilization and surgery, the dressing may need attention. Postoperative edema is normal, so you need to raise your ankle, especially during the first weeks.
The duration of time off work depends on how consolidation progresses and on your occupation, but ranges between 2 and 6 months.

>DRESSING is carefully performed at the end of surgery, according to the surgeon's habits, and usually is not to be changed. If, however, you are having treatment at home, it is important to ensure the hygiene of the surgical scar while the sutures are still there and the scar is not yet completely dry. Hand hygiene is vital, and you must never touch the scar without first washing your hands. Make sure you always have a place nearby to wash or else a hydroalcoholic solution or gel for the nurse who comes to look after you.



>PREVENTING PHLEBITIS: As weight-bearing is usually not allowed for a more or less long period after the operation, you will be prescribed anticoagulants, to prevent phlebitis. The prescription will take account of your history and other medication, such as long-course anticoagulation therapy for another pathology. The prescription and follow-up of treatment will often be coordinated between your surgeon and your anesthetist.

> POSTOPERATIVE CONSULTATIONS

Your surgeon will make regular clinical, radiological and biological check-ups, and the results will go in your medical file.
The (anonymized) data from your file may be used by your surgeon in scientific studies, presentations or publications, in line with the "Jardé" law of March 2012 (Decree 2016-1537). In this case, you will be asked for your specific consent, which will be included in your file.

The first consultations are to check on healing and local conditions. Subsequent consultations monitor progression and functional recovery. X-rays are needed to check that there has been no secondary displacement and that the fracture is consolidating.
Then the immobilization is removed and weight-bearing can be resumed, first partially then completely. Rehabilitation sessions can begin, and your recovery will be guided until you return to your occupational and sports activities, if any.

>POSTOPERATIVE EDEMA (swelling of the foot and toes) is normal after foot and ankle surgery, and is not always a complication. Treatment is important, not just to relieve pain but also to improve healing. A period of rest may be needed, with the foot raised and venous contention using a contention sock or stocking. The edema can last several weeks or even months, without any real consequences, although your may have to adapt your footwear in the meantime.

WHAT TO EXPECT

The operation aims to achieve bone and ligament consolidation in as anatomic a position as possible.
In severe joint and complex fracture (tibial pilon), there may be irreparable cartilage lesions. Initial surgery then aims to realign the bone fragments awaiting a second operation to block the joint. Sick leave will depend on how consolidation progresses, and on your particular occupation, but ranges between 2 and 6 months.

RISKS

Surgery is NEVER entirely risk-free. However much care is taken, "zero risk" does not exist. When you decide to undergo surgery, you need to be aware of this, and weigh the risks against the expected benefit; this is known as the "risk/benefit ratio".

However skillful your surgeon and the team, any treatment can sometimes unfortunately result in failure: recurrence or worsening of symptoms, or other even more serious risks. This may be pure chance or bad luck, but may also implicate your own particular health issues, whether these are known or not, local or general. There is no way of listing every conceivable complication, but we shall present below the most common or the most serious cases sometimes found with your pathology.

> SECONDARY OSTEOARTHRITIS

Pain may persist due to cartilage lesions, gradually leading to osteoarthritis of the ankle.

> STIFFNESS

After a joint fracture, joint stiffening is frequent. This may require physiotherapy, or a further operation to "release" the joint.

> CHRONIC PAIN AND COMPLEX REGIONAL PAIN SYNDROME

In painful pathologies, any medical or surgical treatment may unpredictably leave persistent pain or even worsen existing pain. Chronic pain may set in over the long term, as complex regional pain lasting several months and sometimes leaving trophic or joint sequelae.

> INFECTION

Despite all precautions in disinfection and skin preparation, any surgical incision is open to a risk of microbial contamination that may lead to infection. Infection may occur early, or much later. It often requires antibiotics and sometimes revision surgery, and may leave pain or functional sequelae.
Certain factors such as diabetes, smoking or use of immunosuppressants (corticosteroids, etc.) can increase this risk.
Skin lesions following trauma, whether contusion or bone loss, can lead to infection due to the initial fracture exposure.

> SCAR DISORDER

Despite all the precautions your surgeon takes with the operative wound and all the nursing care, there may be cicatrization problems, sometimes induced by general or local health issues such as diabetes or circulation disorder.
An initial scar due to the fracture can lead to healing disorder, with delay involving a blemish, non-healing or even skin necrosis. Scar disorder can also lead to infection.

> SMOKING

Smoking is an important risk factor in foot and ankle surgery, notably leading to scar disorder, infection and thromboembolic complications and problems of bone consolidation.

It is recommended to cease smoking completely 6 weeks before surgery and for 6 weeks after. If you need help, do not hesitate to call on your family doctor.

> POOR OR NON-CONSOLIDATION

Bone consolidation is achieved on average at 45 to 90 days, but may be later: "delayed consolidation". In rare cases, the fracture fails to consolidate at all, and this is known as "non-union". A further operation may be needed to try to achieve consolidation, possibly by bone graft, using bone taken at a distance from the fracture, usually at the iliac crest in front of the pelvis.
Sometimes the fracture may consolidate, but in a defective position, deviating the ankle; this is known as "malunion". A further operation may be needed to reposition the fragments and achieve consolidation in the correct position.
Secondary displacement of bone fragments is also possible, requiring surgical repositioning. These risks may be aggravated by bone fragility (osteoporosis).

> HARDWARE DISASSEMBLY OR BREAKAGE

Your operation involves mobilizing bone segments and may need some surgical hardware, such as a plate, screws, pins or sutures, to correct a deformity. Like any material, these implants may lead to complications, due either to their intrinsic fragility (breakage) or to displacement of the assembly due to excessive mechanical stress on the structures in which they are implanted, leading to correction loss. The implants may thus sometimes require repeat surgery in case of postoperative displacement or specific complications.

Finally, at a later stage, well after the immediate postoperative period, when your pathology is fully cured, the hardware may be removed in a scheduled operation, depending on the location, or if it is causing discomfort or local impingement.

> HARDWARE REMOVAL

The internal fixation material is usually removed after 6 to 12 months. It may cause you problems of footwear, or pain. In some cases, however, it can be left in place.

>THROMBOEMBOLIC COMPLICATIONS

Any surgery, especially in the lower limbs, can lead to a blood clot obstructing the veins and causing phlebitis. The clot may reach the lung vessels, causing embolism, which can have serious or even life-threatening consequences. Prevention involves suitable treatment during the period of immobilization and non-weight-bearing.

> "NEIGHBORING" COMPLICATIONS

Neighboring anatomic elements may be affected: nerves, vessels, tendons, muscles and even bones situated in the operative area. They may be affected directly or indirectly by surgery, with variable functional impact: hemorrhage, hematoma, paresis, paralysis or desensitization.

The most frequent neighboring complications in ankle fracture are sural nerve lesions, affecting sensitivity in an area of the foot, either by loss of sensation or on the contrary painful hyperesthesia.

In some cases, surgical revision may be required, for example a large hematoma may need surgical evacuation and drainage.

> DRUG-RELATED COMPLICATIONS

After surgery, you may be prescribed specific medication. This most often comprises anticoagulants, analgesics or anti-inflammatory drugs. Obviously, each has its own risks, which may be serious and sometimes unpredictable.

> POSTPONEMENT OF SURGERY

Finally, your operation may have to be postponed, to ensure maximum safety:

-Personal treatments with particular risk: anticoagulants or antiplatelets such as Aspirin or Plavix®;

-large edema with surgical site blistering, depending on your surgeon's opinion;

-forgetting or failing to adhere to the instructions given by your surgeon or anesthesiologist at admission (e.g., not respecting the preoperative fast);

- unexpected unavailability of some necessary equipment, or some problem arising with the operative room, liable to interfere with the procedure, even after you have been anesthetized.

Frequently asked questions

Can both ankles be operated on at once?

If you have both ankles fractured, they can be operated on at the same time or in two separate procedures at a few days' interval. Ask your surgeon, who will advise you on the better choice.

If I am operated on for both ankles, how will that affect pain, and the duration of sick leave?

Pain treatment is generally the same whatever the technique, and will be adapted to the procedure (or procedures). Time off work generally depends on the operation, consolidation time and your possibilities for resuming walking. Depending on the type of fracture, the average sick leave is 3 to 6 months. While you are in hospital and during the postoperative consultations, your surgeon will let you know what best suits your case.

How am I going to manage at home? Will I be able to drive?

Depending on the type of operation, you may or may not be able to put your foot on the ground without crutches. In ankle

surgery, immediate weight-bearing is not always authorized, and you may need either a removable boot or some more rigid type of immobilization, such as a plaster or resin cast. During the immobilization period, it is not possible and would indeed be dangerous to drive. Your surgeon will explain how you can start driving again, depending on your progression.

What do I do if my foot or ankle hurts or swells (edema)?

Edema is frequent, and usually not pathological.
In some cases, it can be associated with severe pain, which may be the sign of something abnormal in the skin scar, the ligament repair or the bone (e.g., a displacement of hardware).

What do I do in case of fever or a problem with the scar?

If you run a temperature (fever), that may be a sign of infection.
If, on dressing, you find that the scar has reddened, is inflamed or shows effusion, consult your surgeon as quickly as possible: he or she will be able to advise you and set up suitable local or general treatment, such as antibiotics.

What do I do if I have pain in the calf, or difficulty breathing?
These signs may be related to a blood clot in a vein (phlebitis) or to migration of a clot to the lung (pulmonary embolism), which may have serious consequences.
The risk is all the greater if, because of the type of operation you have had, you are not authorized to put your foot down on the ground. In that case, you will have been prescribed preventive anticoagulants; but even so, there remains a risk, and these signs should alert you to that.

In general, onset of any new symptom is a reason for consulting your family doctor or your surgeon or, in case of emergency, the center in which you were operated on.

If you cannot manage to contact any of these, do not hesitate to phone 15 (the French emergency ambulance number), where you will be referred.