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Major Trauma Centre Collaborative Cheshire and Mersey Network

Patient information and discharged advice following Surgical Fixation Of a Tibial Shaft Fracture

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Aintree University Hospital
NHS Foundation Trust

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Diagram above shows the location of the Tibia bone in your leg.

What is a Tibial Shaft Fracture?

The tibia is the larger of two bones situated in the lower leg.

The tibial bone (shin-bone) is situated in close proximity to the skin surface and in some cases if fractured (broken) can pierce the skin; this is called a compound fracture.

How is the Tibia fractured?

The Tibia can be broken in many ways. The common types of way's to injure your tibia are:

- Falls
- Direct blows with an object to the leg
- Road traffic collisions
- Gun Shot Wounds
- Sports injuries
- Industrial Injuries

Types of Fracture

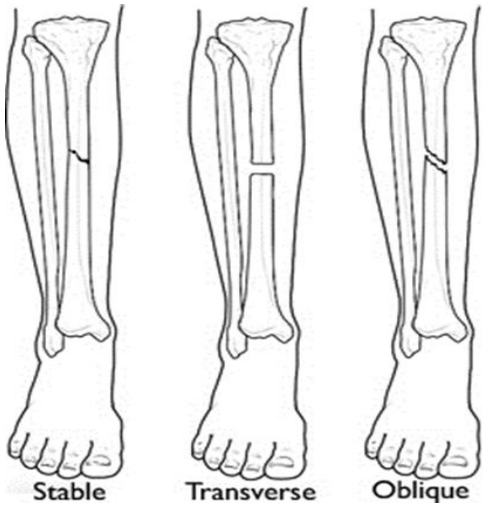
The tibia can break in several ways. The severity of the fracture usually depends on the amount of force that caused the break. The fibula is often broken as well.

Common types of tibial fractures include:

Stable fracture: This type of fracture is barely out of place. The broken ends of the bones basically line up correctly and are aligned. In a stable fracture, the bones usually stay in place during healing.

Displaced fracture: When a bone breaks and is displaced, the broken ends are separated and do not line up. These types of fractures often require surgery to put the pieces back together.

Transverse fracture: This type of fracture has a horizontal fracture line. This fracture can be unstable, especially if the fibula is also broken.



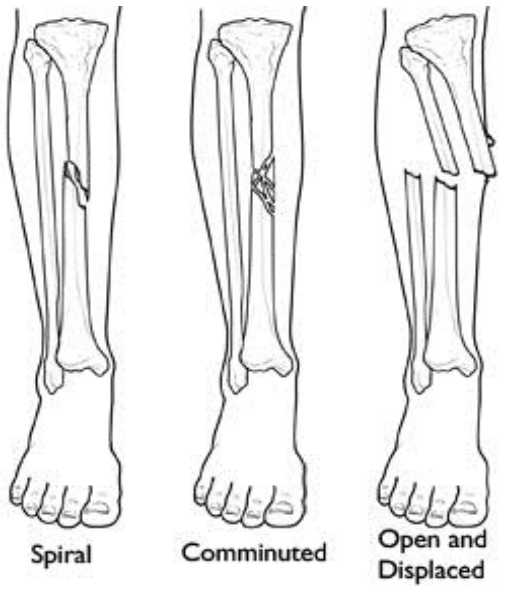
Oblique fracture: This type of fracture has an angled pattern and is typically unstable.

If an oblique fracture is initially stable or minimally displaced, over time it can become more out of place. This is especially true if the fibula is not broken.

Spiral fracture: This type of fracture is caused by a twisting force. The result is a spiral-shaped fracture line about the bone, like a staircase.

Spiral fractures can be displaced or stable, depending on how much force causes the fracture.

Comminuted fracture: This type of fracture is very unstable. The bone shatters into three or more pieces.



Open fracture: When broken bones break through the skin, they are called open or compound fractures.

For example, when a pedestrian is struck by the bumper of a moving car, the broken tibia may protrude through a tear in the skin and other soft tissues.

Open fractures often involve much more damage to the surrounding muscles, tendons, and ligaments. They have a higher risk for complications and take a longer time to heal.

Signs and symptoms may include:

- Pain
- Obvious deformity such as angulation or shortening (the legs are not the same length)
- Breaks in the skin
- Contusions (bruises)
- Swelling
- Bony prominences under the skin
- Instability (some patients may retain a degree of stability if the fibula remains intact or the fracture is incomplete)

How is a fractured shaft of Tibia Diagnosed?

X-rays can show if the bone is broken and whether there is displacement (the gap between broken bones). They can also show how many pieces of bone there are.

Computed tomography (CT) scan

After reviewing your x-rays, your doctor may recommend a CT scan of your leg. This is often done if there is a question of the fracture extending into either the knee or ankle joint.

A CT scan shows a more detailed image of your limb. It can provide your doctor with valuable information about the severity of the fracture.

Complications

A tibial shaft fracture can cause further injury and complications.

- Sharp fragments may cut or tear adjacent muscles, nerves, or blood vessels.
- Excessive swelling may lead to compartment syndrome, a condition in which the swelling cuts off blood supply to the leg.

- This can result in severe consequences and requires emergency surgery once it is diagnosed.
- Open fractures can result in long-term deep bony infection or osteomyelitis, although prevention of infection has improved dramatically over the past generation.
- Open fractures may require skin grafting if wounds cannot be closed.

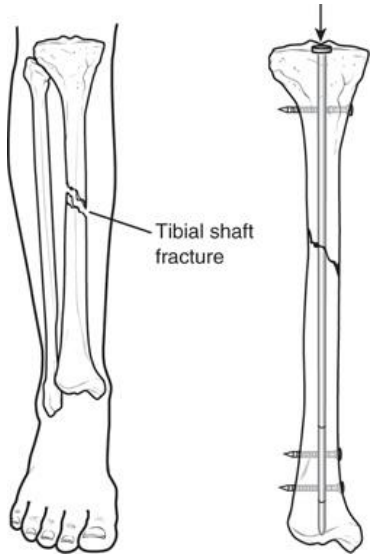
Surgical Treatment

Your doctor may recommend surgery for your fracture if it is:

- An open fracture with wounds that need monitoring
- Extremely unstable because of many bone fragments and large degrees of displacement
- Not healed with nonsurgical methods

Intramedullary nailing. The current most popular form of surgical treatment for tibial fractures is intramedullary nailing.

During this procedure, a specially designed metal rod is inserted from the front of the knee down into the marrow canal of the tibia. The rod passes across the fracture to keep it in position.



(Diagram above demonstrates tibial fixation with an Intramedullary nail.)

Intramedullary nails come in various lengths and diameters to fit most tibia bones. The intramedullary nail is screwed to the bone at both ends.

This keeps the nail and the bone in proper position during healing. Intramedullary nailing allows for strong, stable, full-length fixation.

The technique also makes it more likely that the position of the bone obtained at the time of surgery will be maintained when compared with casting or external fixation.

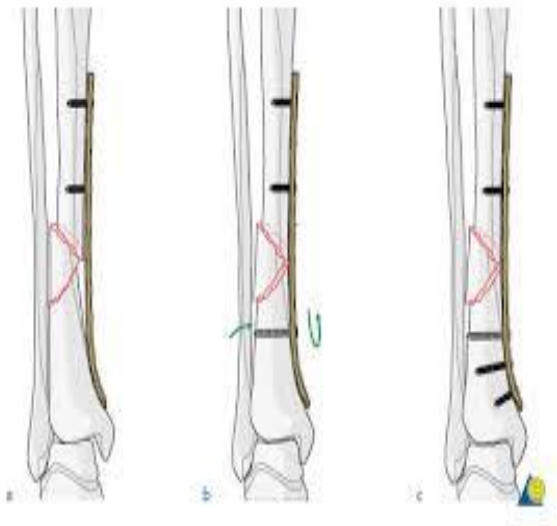
Plates and screws.

Tibial shaft fractures were once routinely treated with plate and screw constructs.

These tools are reserved for fractures in which intramedullary nailing may not be possible or optimal, such as certain fractures that extend into either the knee or ankle joints.

During this type of procedure, the bone fragments are first repositioned (reduced) into their normal alignment.

They are held together with special screws and metal plates attached to the outer surface of the bone

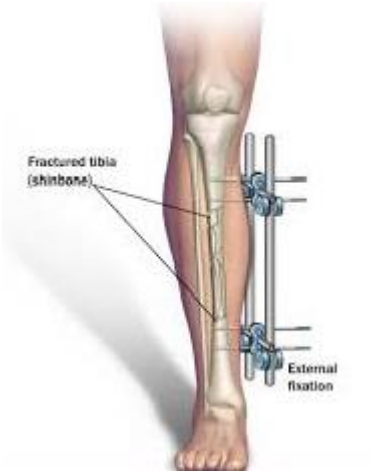


(Diagram above demonstrates tibial fixation with plates and screws.)

External fixation

In this type of operation, metal pins or screws are placed into the bone above and below the fracture site. The pins and screws are attached to a bar outside the skin.

This device is a stabilizing frame that holds the bones in the proper position so they can heal.



(Diagram above demonstrates tibial fixation with an external fixator.)

Surgical Complications

Surgical complications include:

- Malalignment, or the inability to correctly position the broken fragments
- Infection
- Nerve injury
- Vascular injury
- Blood clots (these may also occur without surgery)
- Nonunion (failure of bone to heal)
- Angulation (with treatment by external fixation)

Secondary Surgery

Certain factors are often associated with difficulties in fracture healing.

Open fractures, in which the bone fragments are displaced enough to exit the skin, typically sustain greater injury and are at increased risk for infection.

This may stall or prevent healing. These fractures are more likely to require secondary surgical procedures.

Fractures that are directed straight across the bone are typically the result of higher energy mechanisms (as opposed to the spiral-type fractures seen with low-energy twisting injuries).

They also have increased injury to the tissues that are required for healing, and are associated with a greater occurrence of secondary surgeries.

These two factors are beyond the surgeon's control. A third and more controllable factor is getting the major fragments in line with each other and pushed together with surgery.

Recovery

In addition, your general health may have an effect on healing. Smoking and corticosteroid use affect both bone and skin healing, so it is important to tell your doctor if you use these.

How long it takes to return to daily activities varies with different types of fractures. Some tibial shaft fractures heal within 4 months, yet many may take 6 months or longer to heal.

This is particularly true with open fractures and fractures in patients who are less healthy.

Therapy

The joint therapy team of physiotherapists and occupational therapists will have carried out detailed assessments of your needs, and given you a plan for discharge or on-going rehabilitation.

There may be a need for you to be transferred to rehabilitation during the recovery period.

Assessments will take place to identify any equipment that you will need for discharge. (We do not normally provide wheelchairs for short term use.

If the therapists feel you would benefit from having a wheelchair you will be provided on details of how to loan one.)

The physiotherapist will show you some additional exercises and advise you when to start them. A paper copy of the exercises will be provided by the physiotherapy team

Medication and Pain Relief

You will be given pain relieving medication to take home with you, please take as prescribed to prevent pain building to an intolerable level. (Please follow advice on medication packaging).

We normally provide a 1 week supply of medication on discharge. A discharge summary letter will be sent to your GP with details of your hospital stay, and a current list of your medication.

We will normally provide you with a copy of this letter with your medication on discharge.

Regular pain medication may cause constipation. If this occurs please see your local pharmacist for advice.

Driving

If you drive, please liaise with your consultant team and DVLA to discuss when it is safe for you to resume.

If you drive against medical advice, your insurance may be void.

VTE (venous thrombo-embolism)

VTE is a collective term for 2 conditions:

- DVT (deep vein thrombosis) – this is a blood clot most commonly found in a deep vein that blocks the flow of blood.
- PE (Pulmonary embolism) – a potentially fatal complication where a blood clot breaks free and travels to the lungs.

Whilst you are less mobile, the risk of VTE is higher.

VTE is a major health risk in the UK. Your consultant will discuss with you if intervention with anticoagulation (blood thinners) is required.

Things that you can do to prevent VTE:

- Mobilise as instructed by the consultant and therapy teams.
- Keep well hydrated – drink plenty of water.
- We strongly advise you not to smoke. This is a great opportunity to stop smoking. The ward staff or your GP can help you to access smoking cessation services.
- If you have been recommended anticoagulation therapy, please comply fully with the treatment for the duration of the course.

Some patients who have suffered a fractured Tibia will go home with 6 weeks (post operation) blood thinning injections.

Your Consultant, Pharmacist and Nursing team will speak to you re this.

Symptoms

- Swelling – you may already have some swelling of the legs, but increase in swelling needs to be assessed.
- Calf tenderness and increased pain.
- Heat and redness in one or both legs.
- Unexplained shortness of breath.
- Chest pain when breathing in.

A blood clot can occur without any symptoms. If you have any concerns seek immediate advice.

Follow up

You will be provided with a clinic follow up after discharge, to attend Major Trauma Follow up clinic.

You may also require other follow ups if you was seen by other specialities

Useful Contacts

- Major Trauma Ward Manager – Vanessa Lownsbrough (0151) 529 8278
- Major Trauma Nurse Coordinator : 0151 525 5980 ask for bleep 5428 (7 day service 8am-8pm)
- Major Trauma Nurses 24hr answering machine. Leave name contact number and short message. Telephone number 0151 529 2551
- Orthopaedic Trauma Nurse Coordinator: 0151 525 5980 ask for bleep
- Ward 17 Orthopaedics ward: 0151 529 3511/3812
- Major Trauma Ward co-ordinator (24 hour service) (0151) 529 6255
- Fracture Clinic (Monday to Friday) (0151) 529 2554
- NHS Direct: 111

If you require a special edition of this leaflet

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Tel No: 0151 529 2906

Email: interpretationandtranslation @aintree.nhs.uk