

Fractures of the bones of the leg

Fractures of the bones of the foot include fractures of the heel bone, ankle bone, other tarsal bones, metatarsal bones, and toe joints. Other foot injuries can be dislocations of the talus and other tarsal bones.

Fractures of the calcaneus

Due to the predominance of spongy bone tissue, the calcaneus breaks quite often. Fractures of the calcaneus account for 2% of all fractures. Fractures of the calcaneus are usually caused by an impact on the heel when jumping from a great height. This injury is often associated with fractures of the lumbar vertebrae and other bones of the leg.



X-ray image of a heel bone fracture

Essex-Lopresti classification

- Type I - *extra-articular* fractures
- Type II - *intra-articular* fractures, which are divided into *articular-depressed* and *lingual* type

Clinical picture and diagnosis

The limb cannot be loaded due to **extreme pain**, the talocrural joint can only be moved very limitedly. Everything is accompanied by massive edema, sometimes even compartment syndrome. Hematoma and bullae form at the site of injury. The diagnosis is carried out using an X-ray examination, the calcaneus is scanned in **the axial and anteroposterior projection**. CT scans and 3D reconstructions are also

performed.

Treatment

For non-dislocated fractures and extra-articular displaced fractures, the leg is immobilized with a modeling plaster. This is a **conservative** therapy. Intra-articular fractures are treated with **surgery**. The calcaneus is stabilized with a screw, fan of Kirschner wires, or an external fixator. During surgery, the calcaneus is also repositioned and remodeled.

Fractures of the ankle bone

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Neck fractures

The neck of the talus breaks against the tibia during a high impact when the leg is forcibly dorsiflexed. Dislocation of fragments sometimes occurs due to shearing forces. The leg is extremely painful, swollen and cannot be used to move.

RTG is used for diagnosis. Specifically, an **anterior, lateral and oblique dorsoplantar** image is performed. If there was no dislocation of the fragments, plaster fixation is used for treatment. Dislocated fractures should be repaired as quickly as possible, then fixed with plaster and checked with an X-ray.

Fractures of the body

The body of the ankle bone breaks by transferring the energy, which is created when the foot hits the ground violently, from the tibia to the talus. In many cases, *comminuted fractures* occur.

Clinical signs include pain, deformity, swelling, hematoma, and limited ability to move.

Non-dislocated fractures are treated conservatively. Dislocated fractures are stabilized by osteosynthesis.

Fractures of other tarsal bones

In addition to the calcaneus and talus, the tarsal bones include the os cuboideum, os naviculare and ossa cuneiformia. Fractures of these bones usually occur by a **direct** mechanism. Because of the strong *interosseous ligaments* there is usually no dislocation of the fragments.

Clinical picture and diagnosis

The leg is painful, swelling occurs and a hematoma forms. The diagnosis is confirmed by **X-ray images**'.

Treatment

Non-dislocated fractures are fixed with a modeling plaster, so they are treated conservatively. Dislocated fractures must be re-set, fixed with crossed Kirschner wires to adjacent bones.

Metatarsal fractures

They are usually caused by a *direct* mechanism - by running over or falling a heavy object on the leg. Specific fractures are ``fractures of the base of the V. metatarsus, which are caused by the pull of the tendon *m. fibularis brevis*, and the so-called "marching (fatigue) fractures" II., III. and IV. metatarsus.

Clinical picture

Fractures are accompanied by pain and swelling.

Treatment

Non-dislocated fractures are treated conservatively. Dislocated fractures are solved by transfixation with Kirschner wires, or they are stabilized with small plates. The base of the V. metatarsus is fixed intramedullary with a screw.

Fractures of the finger joints

These fractures occur similarly to fractures of the metatarsal bones by a **direct** mechanism.

Treatment

Fixation with Kirschner wires or a small plate is used for fractures of the "base joint of the thumb". Other fractures of the finger joints are treated only with patch fixation.

Dislocation of the ankle bone

- **Subtalar luxation** - The position of the tibiotalar joint does not change, only dislocation occurs in the subtalar and possibly also in the talonavicular joint. Depending on which direction the foot is against the ankle bone, it is an *anterior, posterior, medial* or *lateral peritalar dislocation*.
- **Complete (double) dislocation** - Dislocation occurs in the *lower and upper ankle joint*. There will be a complete interruption of the vascular supply to the thallus. It may be an open wound.

Clinical picture and diagnosis

The leg is painful and its shape is greatly deformed. Diagnosis is made by X-ray examination.

Treatment

Urgent reduction of dislocations is performed. The leg is then immobilized with a cast.

Luxation of other tarsal bones

Most often, dislocations occur in the *Chopart* and the *Lisfranc joint*. Isolated luxation of the "navicular bone" also occurs quite often.

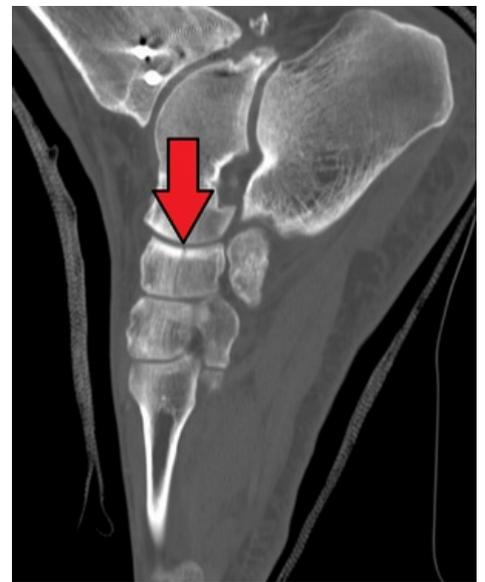
Luxation in Chopart's joint

In most cases, conservative therapy is used for dislocations in Chopart's joint, reduction is ideally performed under general anesthesia. This is followed by plaster fixation, which immobilizes the joint.

Dislocation in the Lisfranc joint

Complete and partial dislocations and dislocation fractures occur in the Lisfranc joint. Treatment is based on early reduction and subsequent plaster fixation. If the joint is unstable, it is transfixed with Kirschner wires.

Isolated navicular dislocation



A complete isolated dislocation of the os naviculare is also called an *enucleation*. It occurs during a violent plantar flexion of the leg. In this injury, the navicular bone can be felt, protruding above the surrounding bones. Early reduction and plaster fixation are performed.

Links

References

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References

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