

Types of fractures and their dislocations

A **fracture** is a disruption of the continuity of the bone. It is caused by overcoming the elastic capabilities of the tissue by pressure, tension, displacement, or a combination of all of the above. The mechanism of formation can be either **direct**, when the force acts directly at the fracture site, or **indirect**, when forces are applied in an area far from the fracture site. Fractures caused by a direct mechanism are usually accompanied by severe damage to soft tissues; in indirect ones, the skin cover is not broken. Roughly speaking, we can divide fractures into **open** and **closed**.

We distinguish between fractures :

- **Accident**,
- **Fatigue** (stress) which arise on the basis of repeated microtraumas during overuse,
- **Pathological**, resulting from weakening of the bone, for example by metastasis.

Fracture Types

Division according to the mechanism of formation

1. **Compression fractures** are those when violence acts in the axis of the bone, the spongiosa is mainly broken. Typically, this involves the proximal part of the tibia and calcaneus.
2. **Impact fractures** are caused by the application of violence to a small area of bone that is pushed inward. We find them, for example, on the *bones of the skull* ..
3. **Strain fractures** are caused by the stretching of [[muscles]and tendons. They are usually found in attachment sites; *patella, olecranon, tuberculum majus, spina iliaca anterior superior*.
4. **Bending fractures** are caused by the action of shearing, displacement forces, for example on the neck of the femur .



Metacarpal fracture

Division according to the course of the fracture line

- **transverse**
- **oblique**
- **spiral**
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- **vertical** (chiseled in compacts, impressive in spongiosa)
- **tangential** (osteochondral)
- **avulsion** (with muscle attachments)

Division according to the number of fragments

- **two, three, four** and **fragmentary**
- **two-story fracture** – on long bones, when the intermediate fragment is longer than 6 cm



Pathological fracture – metastasis of non-small cell lung cancer

dislocation fractures

⚠ **Dislocations are always evaluated according to the position of the *peripheral* fragment against the central fragment (only dislocation fractures of the spine are described in the opposite way).**

Dislocation fractures:

- *ad latus* – to the side,
- *ad longitudinem* – to length:
 1. *with distraction* (prolongation),
 2. *with contraction* (shortening),
- *ad axim* – angular,
- *ad peripheriam* – rotary.

According to the result of the reduction, we are talking about fractures ::

- reusable and stable,
- reponible and unstable,
- irreponible.

Classification of fractures

The main importance is the **AO classification** (classification according to the Arbeitsgemeinschaft für Osteosynthesefragen, i.e. the working association for questions of osteosynthesis):

- *first figure* – expresses the affected bone
 - 1 – humerus
 - 2 – forearm bones
 - 3 – femur
 - 4 – lower leg
 - 5 – spine
 - 6 – pelvis
 - 7 – hand
 - 8 – foot
 - 9 – head
- *second figure* – determines the bone segment for long bones:
 - 1 – proximal epimetaphysis
 - 2 – diaphysis
 - 3 – distal epimetaphysis
- *third figure* shows the type of fracture (A-C), for each part it is specific
 - each type is divided into **groups 1-3**
 - each group is further divided into **subgroups 1-3**

With a higher number, the severity of the fracture increases. (note: AO classification was well received, with the exception of the proximal part of the humerus (AO is very complex) and the femur, where this classification is not sufficient).

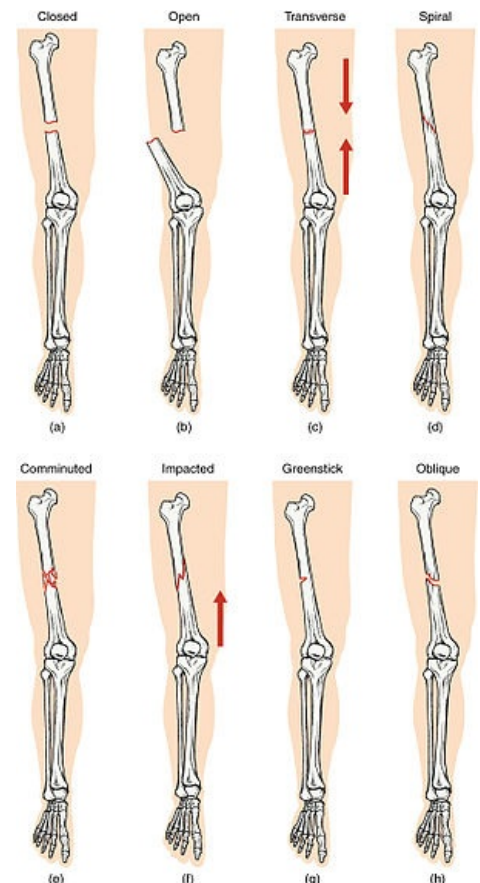
Links

Related Articles

- bone fractures (signpost)
- open fractures
- fracture healing disorders
- injury

References

- VIŠŇA, Petr and Jiří HOCH, et al. *Traumatology of adults: a textbook for medical faculties*. 1st edition. Prague: Maxdorf, 2004. 157 pp. ISBN 80-7345-034-8



Overview of fracture types



CT dislocation fracture of the lumbar spine