TRAUMA

Techniques of reduction (1)

Direct and indirect reduction

Tasks

Examine bone models; reduce fractures directly or indirectly, according to fracture pattern, location, and surgical approach

Learning objectives

- Differentiate between direct and indirect reduction
- Relate both techniques to specific indications and bone segments

Take-home message

Direct reduction

- Fracture reduction is achieved by direct manipulation with instruments and under direct or C-arm vision

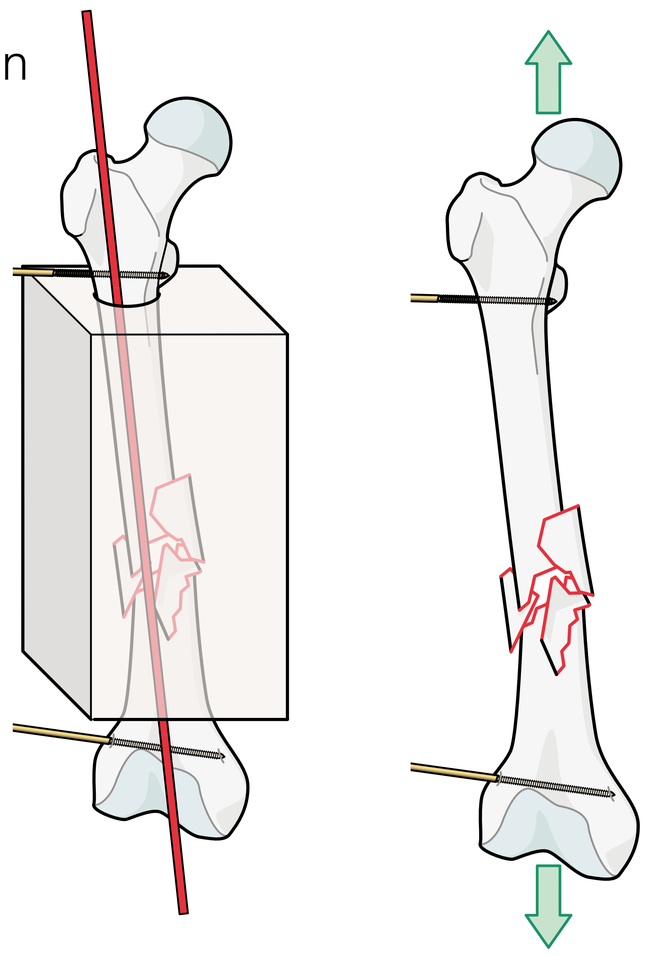
Indirect reduction

- Fracture site is not exposed, reduction is performed by applying corrective forces and moments at a distance from the fracture utilizing distraction with soft tissues such as capsule, ligaments, periosteum, muscles, tendons
- Reduction is checked clinically or using image intensifier, x-rays

Metadiaphyseal segment

Indirect reduction to obtain

- Length
- Axial alignment
- Rotational alignment



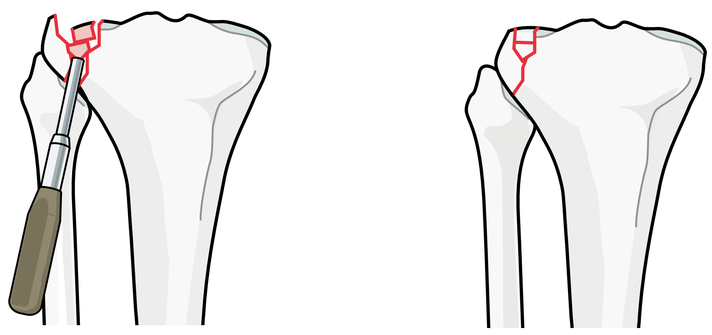
A diaphyseal fracture is a black box

- No visualization
- No direct contact

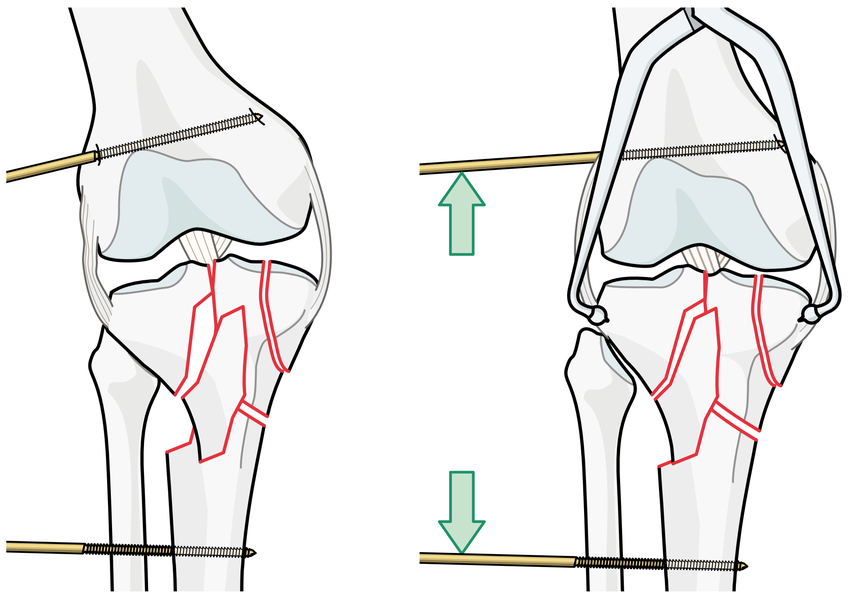
Articular segment

Anatomical reconstruction of the joint surface

Direct reduction



Indirect reduction, ligamentotaxis



AO TRAUMA

Techniques of reduction (1)

Use of reduction clamps

Tasks

1 Examine a variety of reduction clamps/forceps

2 Apply different tools at different anatomical sites

Learning objectives

- Identify the degrees of freedom for each clamp
- Recognize difficulties in the application of the different devices
- Analyze biological advantages and shortcomings of different clamps

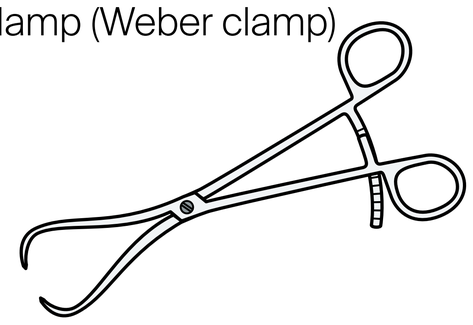
Take-home message

Use proper tools according to the anatomical and technical conditions

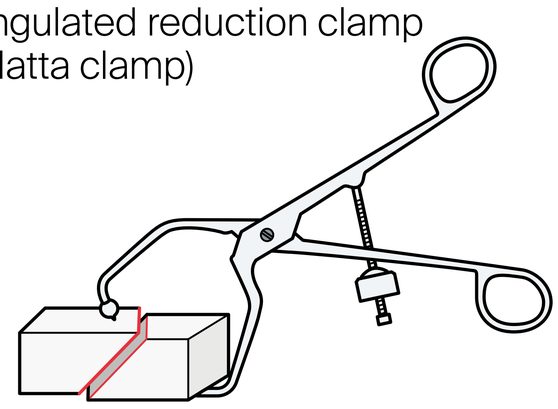
The term clamps and forceps are sometimes used interchangeably.

Pointed reduction clamps

Pointed reduction clamp (Weber clamp)



Angulated reduction clamp (Matta clamp)



Standard reduction clamp

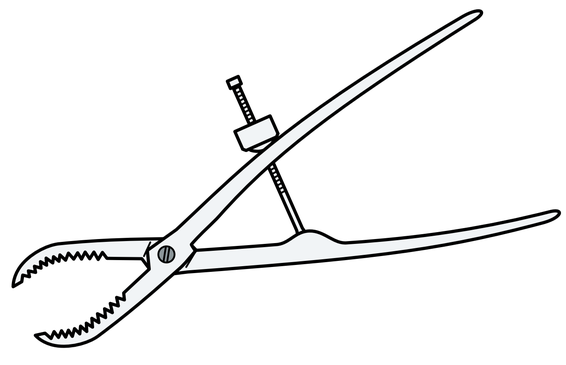
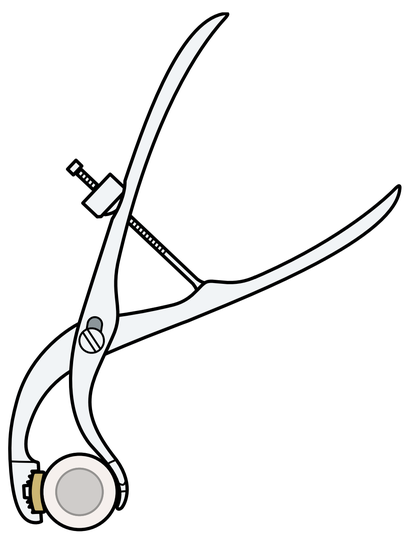
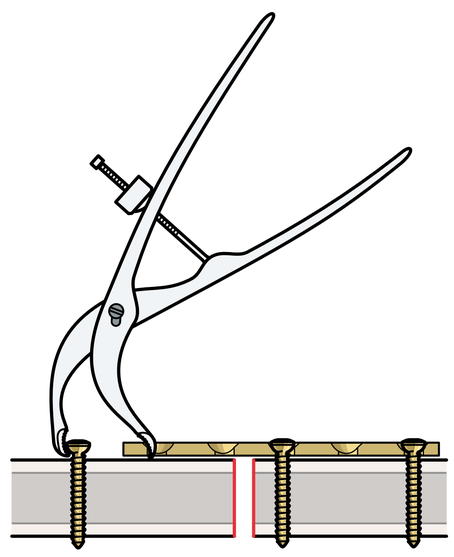


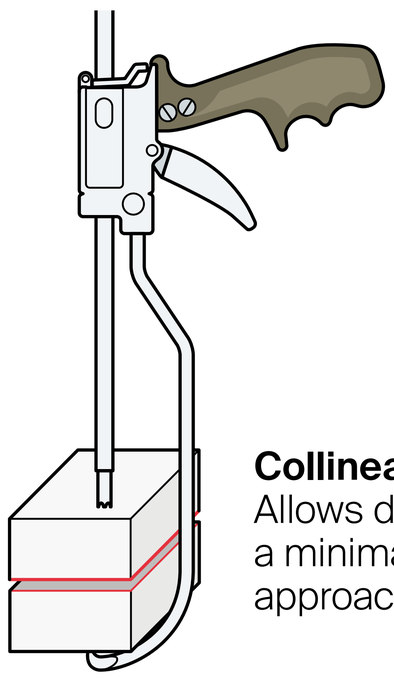
Plate holding clamp



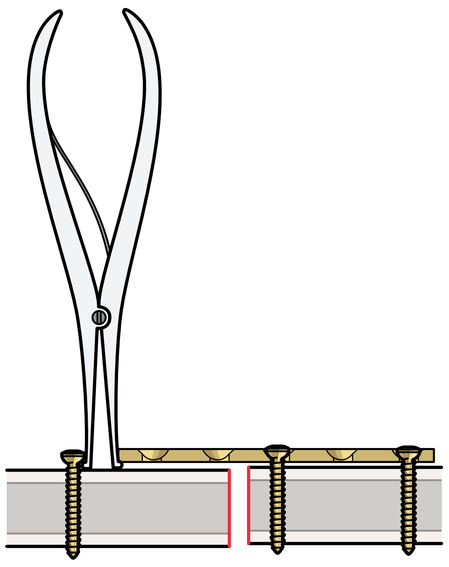


Compression
Pulling the plate end towards the screw

Other reduction tools



Collinear reduction clamp
Allows direct reduction through a minimally invasive surgical approach



Lamina spreader