Bone fractures in young dogs, conservative fracture treatment

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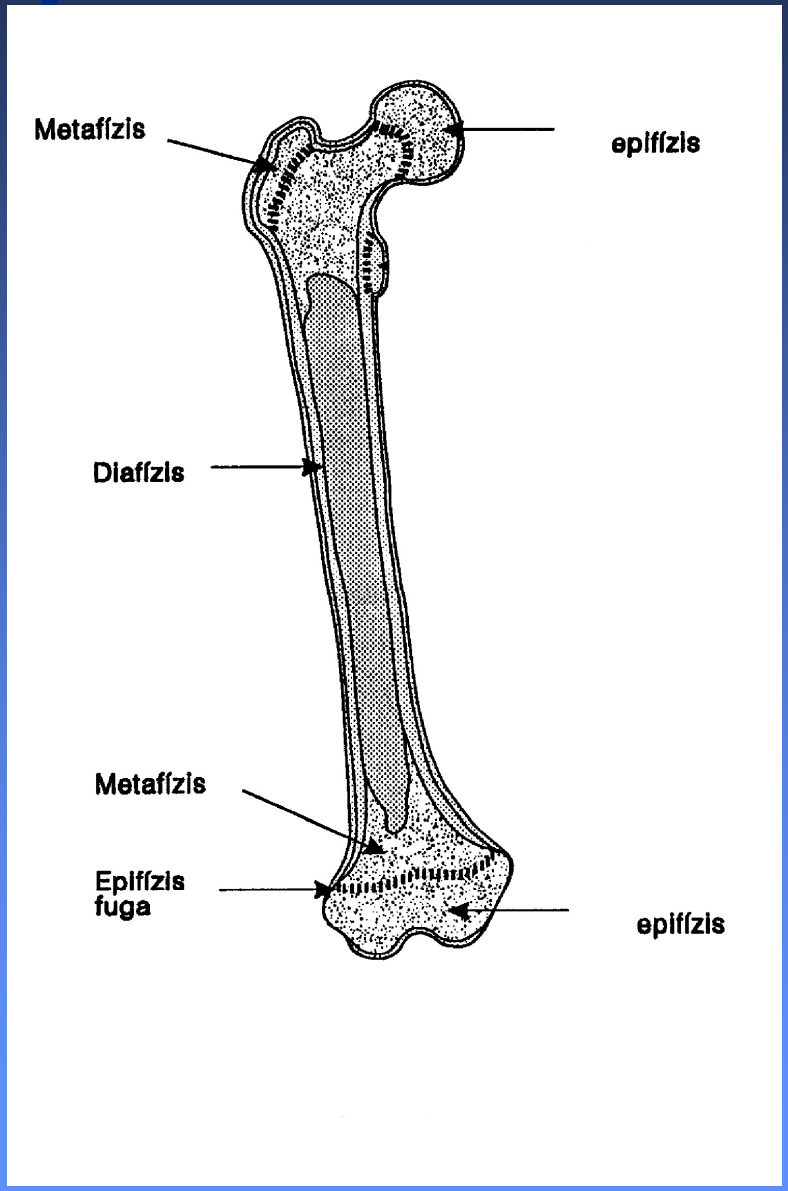
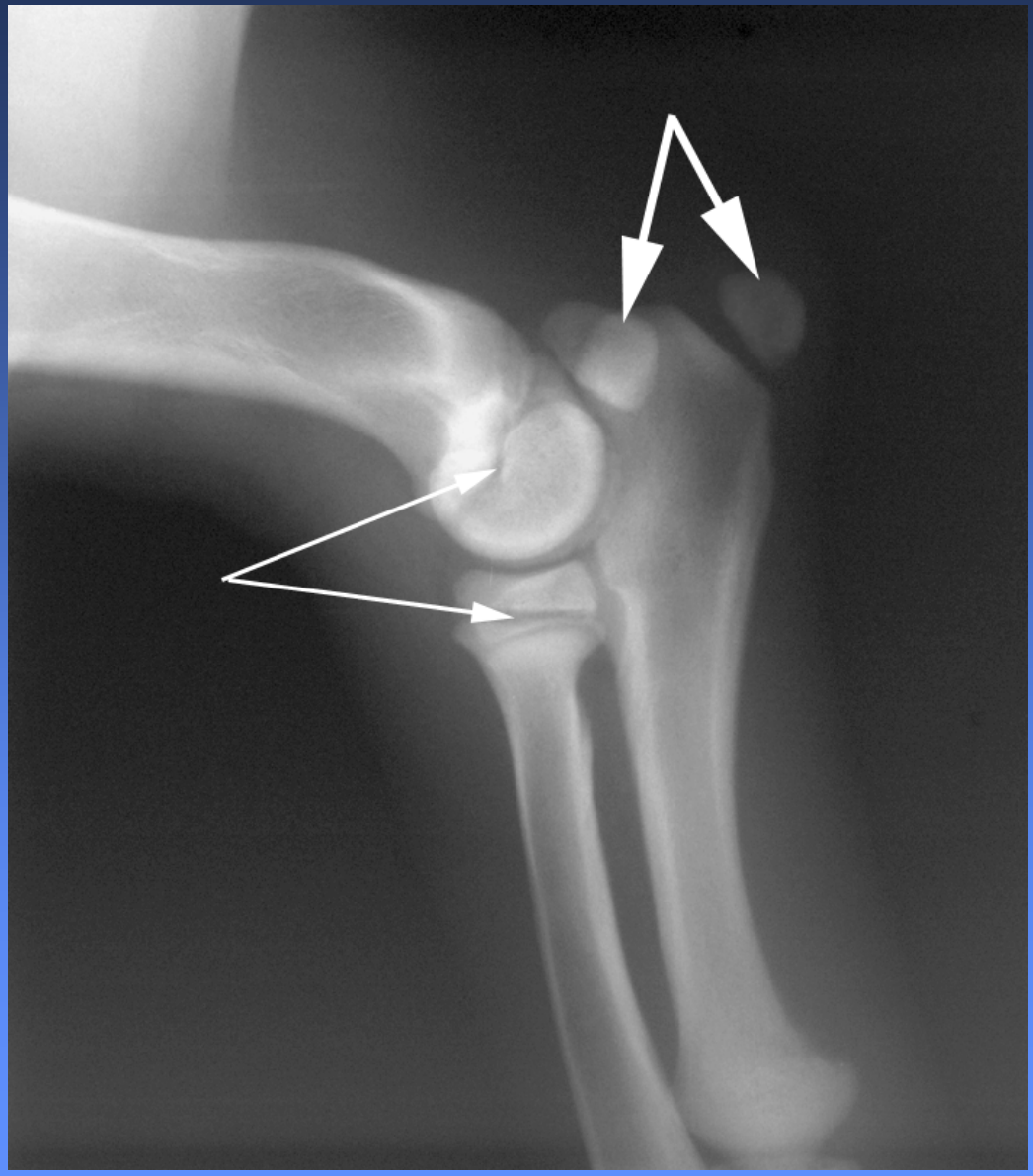
MAGYAR KISÁLLAT ORTOPÉDIAI EGYESÜLET

Bone fracture

is a complete or incomplete disruption in the continuity of the bone

Differences is growing dogs

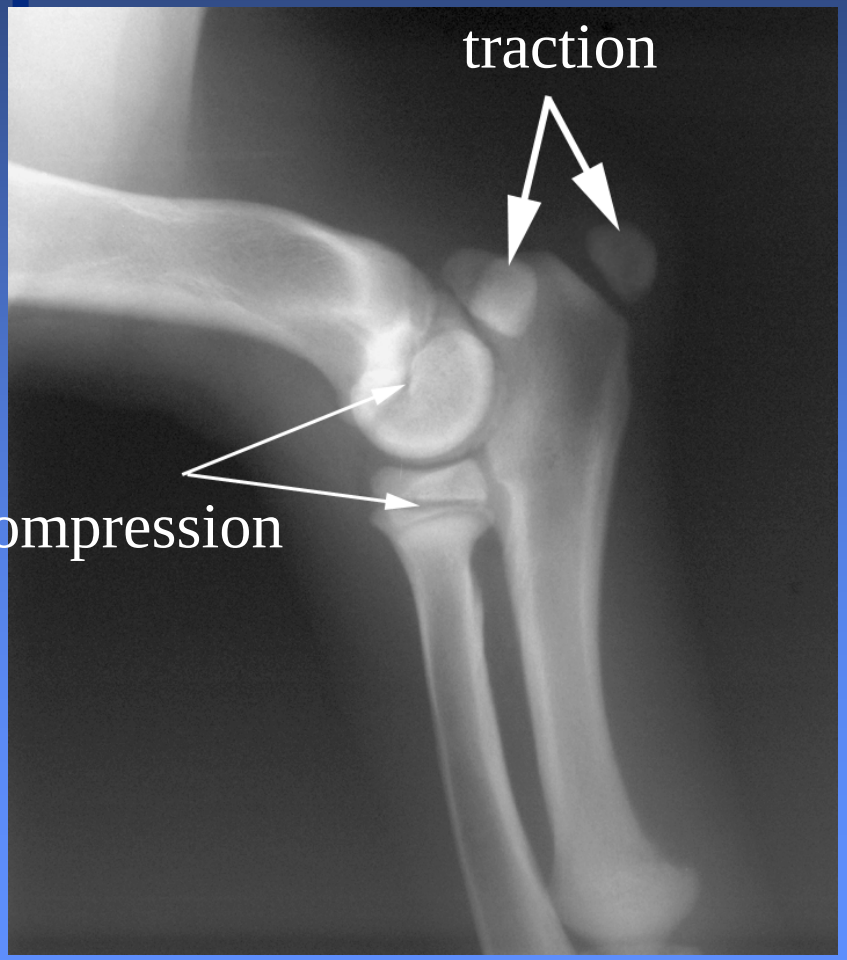




Typical fractures of immature dogs

- **Diaphyseal:**
  - **Fissure fractures**
  - **Green stick fractures**
- **Meta-epyphyseal:**
  - **Growing plate injury**

Fractures involving the Epiphyseal plate



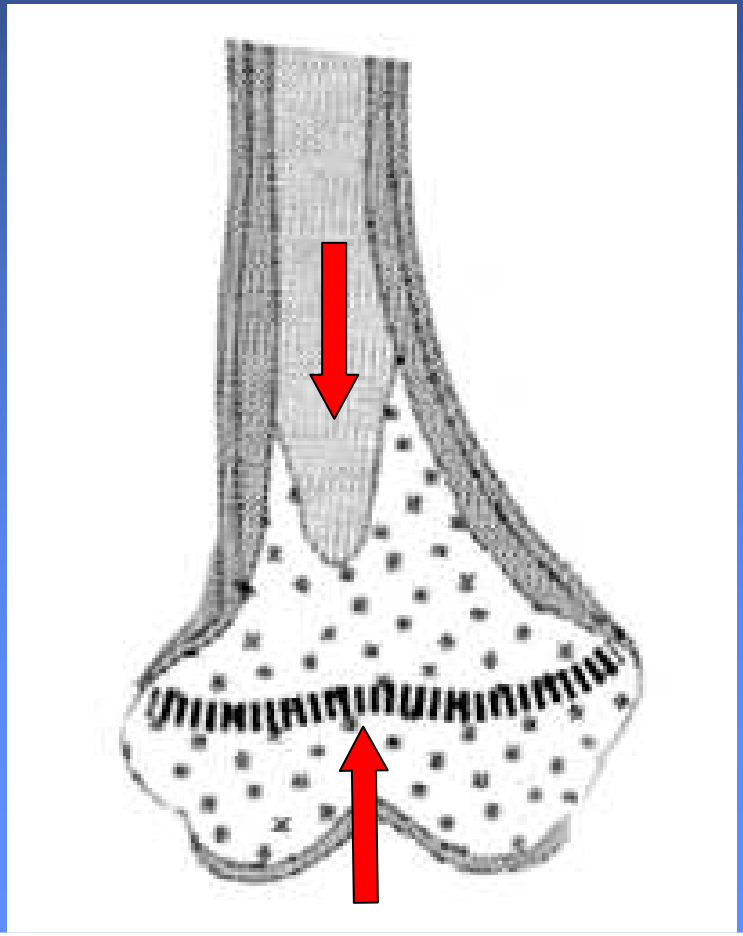
Epiphysis types

Epipyses under traction are subjected to avulsion injuries

Epipyses under compression

The injuries are classified by

Salter and Harris (SH I-V.)



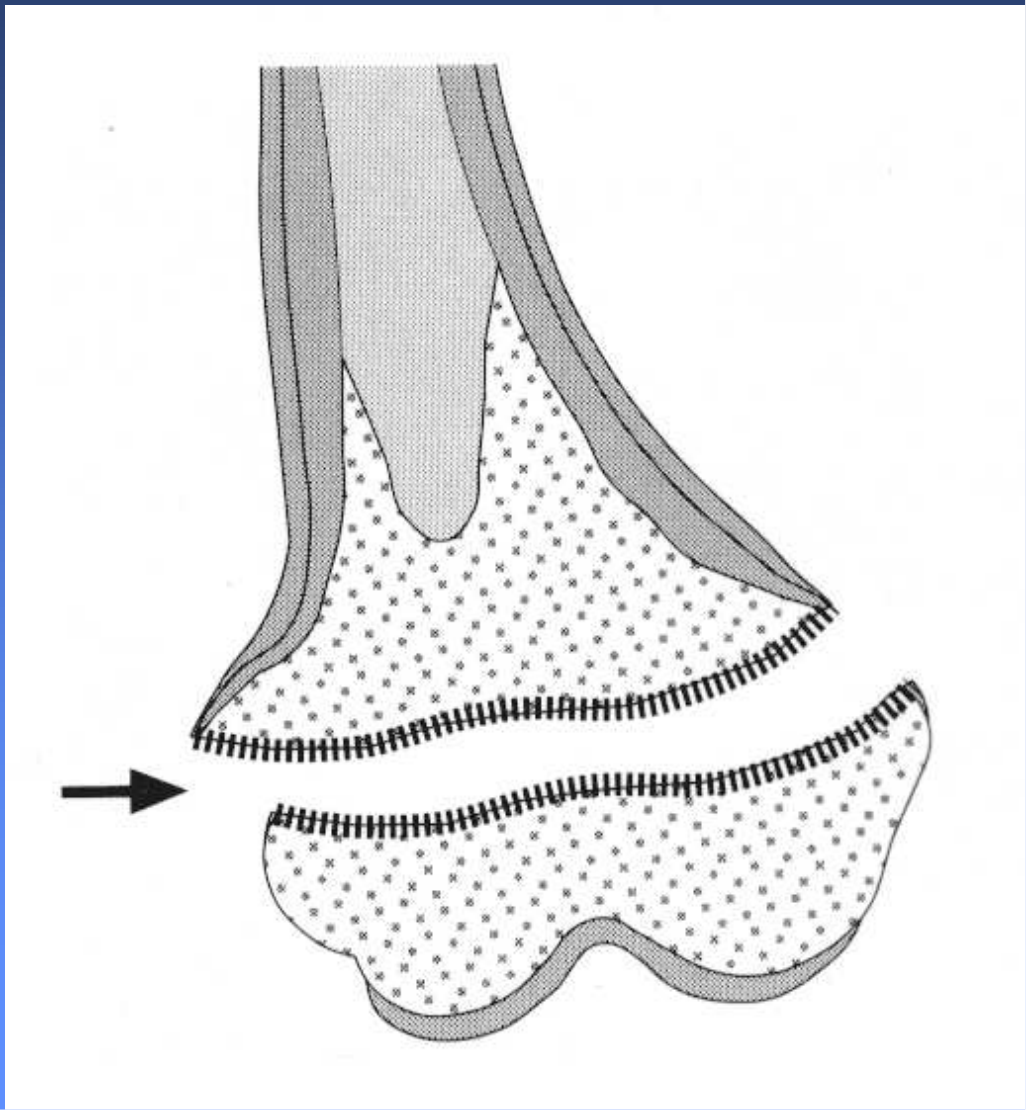
Salter-Harris classification SH I-V.

- As the number increases,

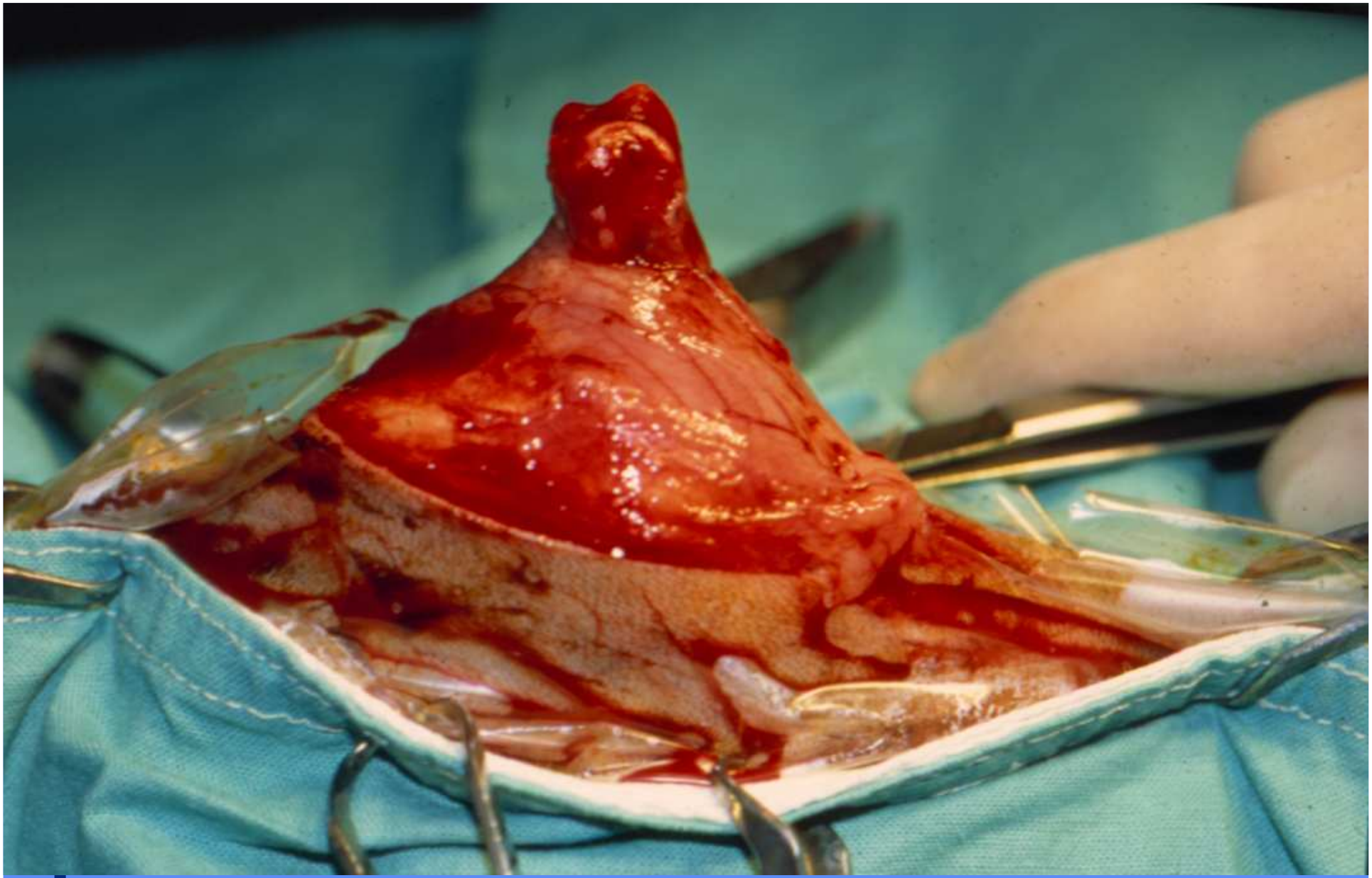
  the complication rate rises

SH-I.

- Complete separation between the epiphysis and metaphysis

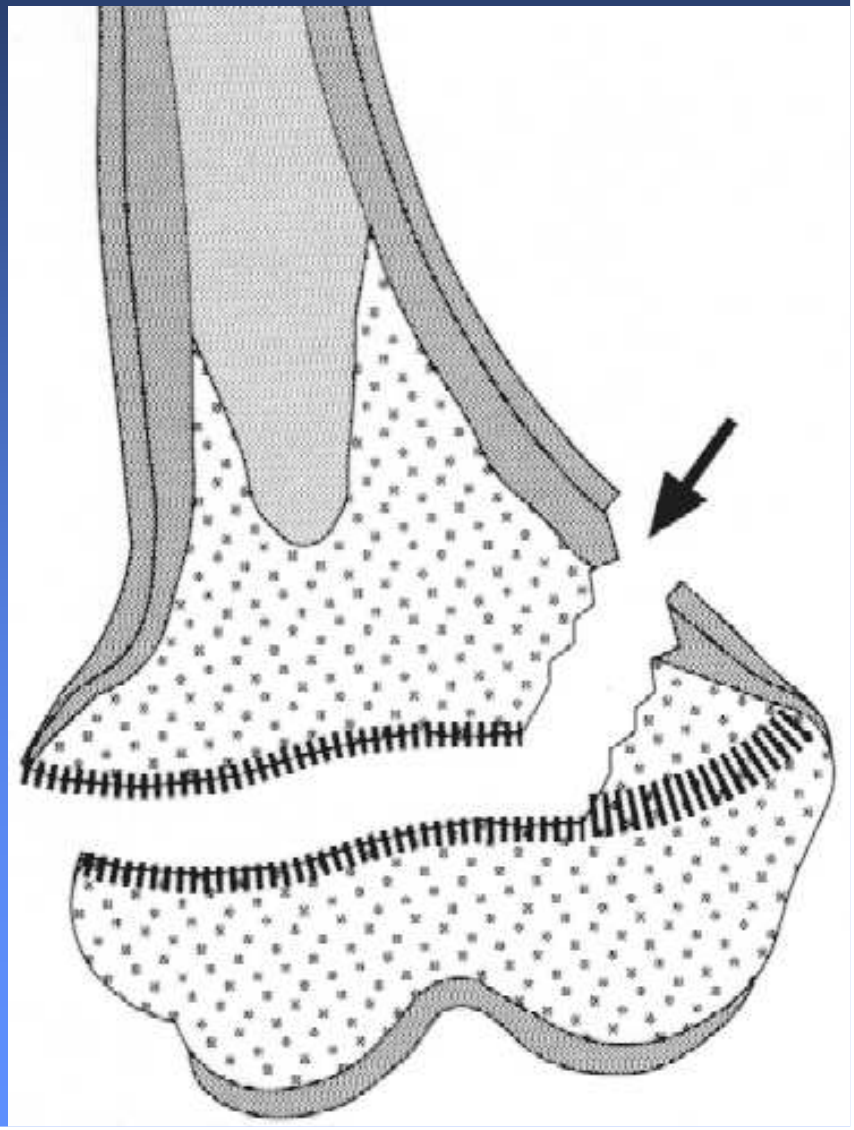


Distal femoral SH-I.

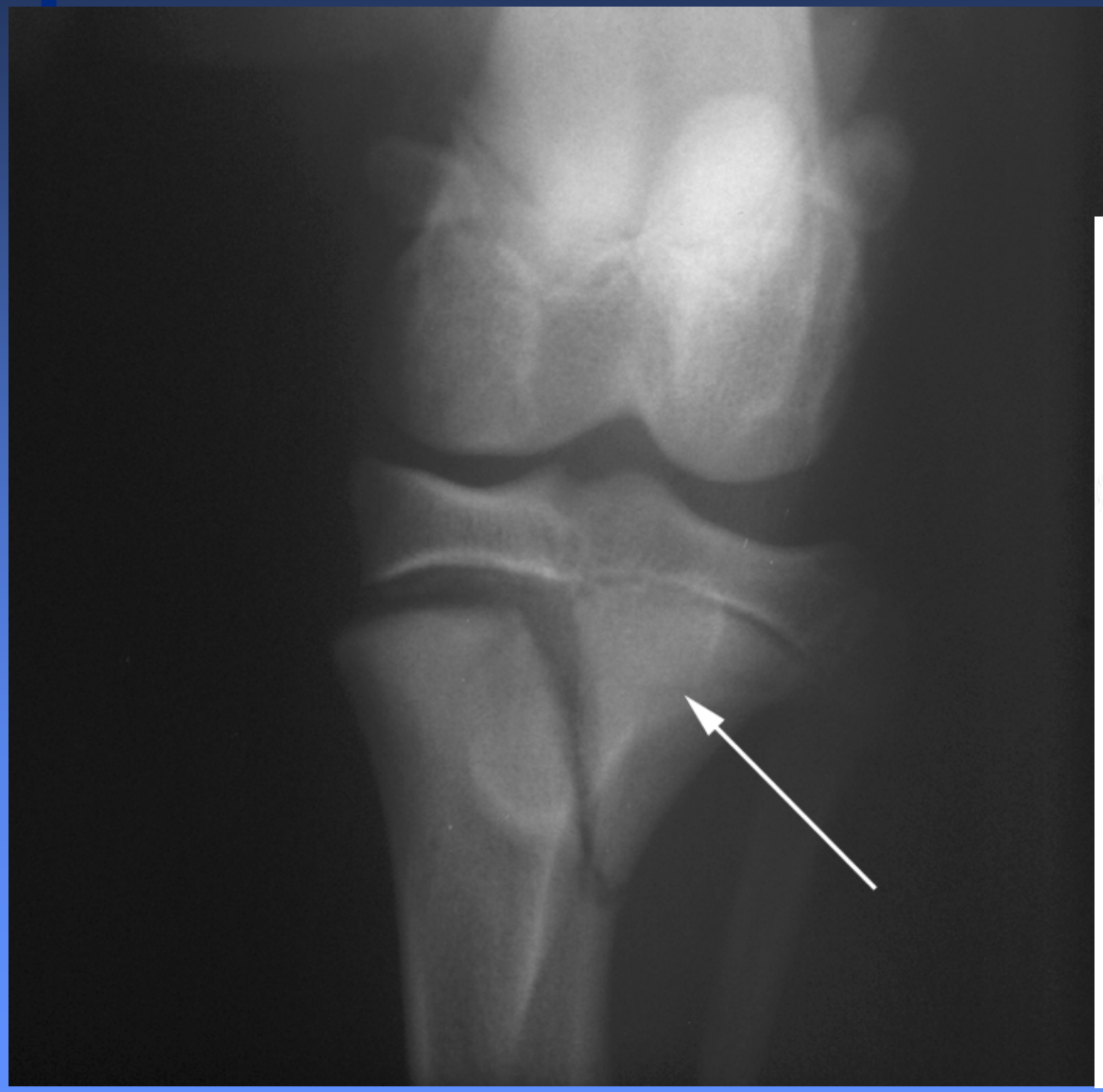


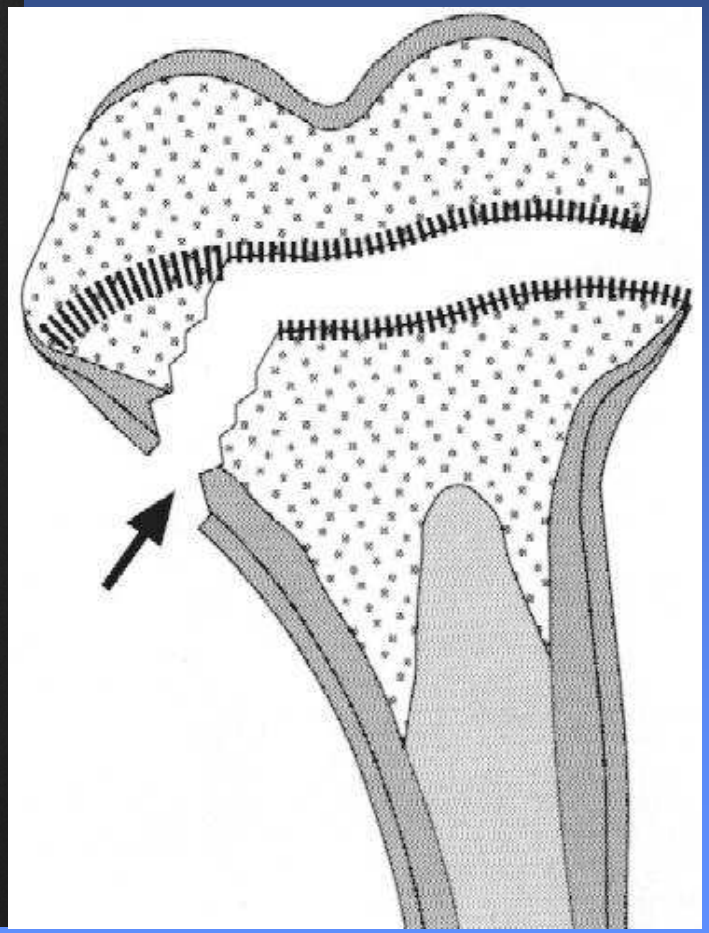
SH-II.

- The fracture starts in the metaphysis



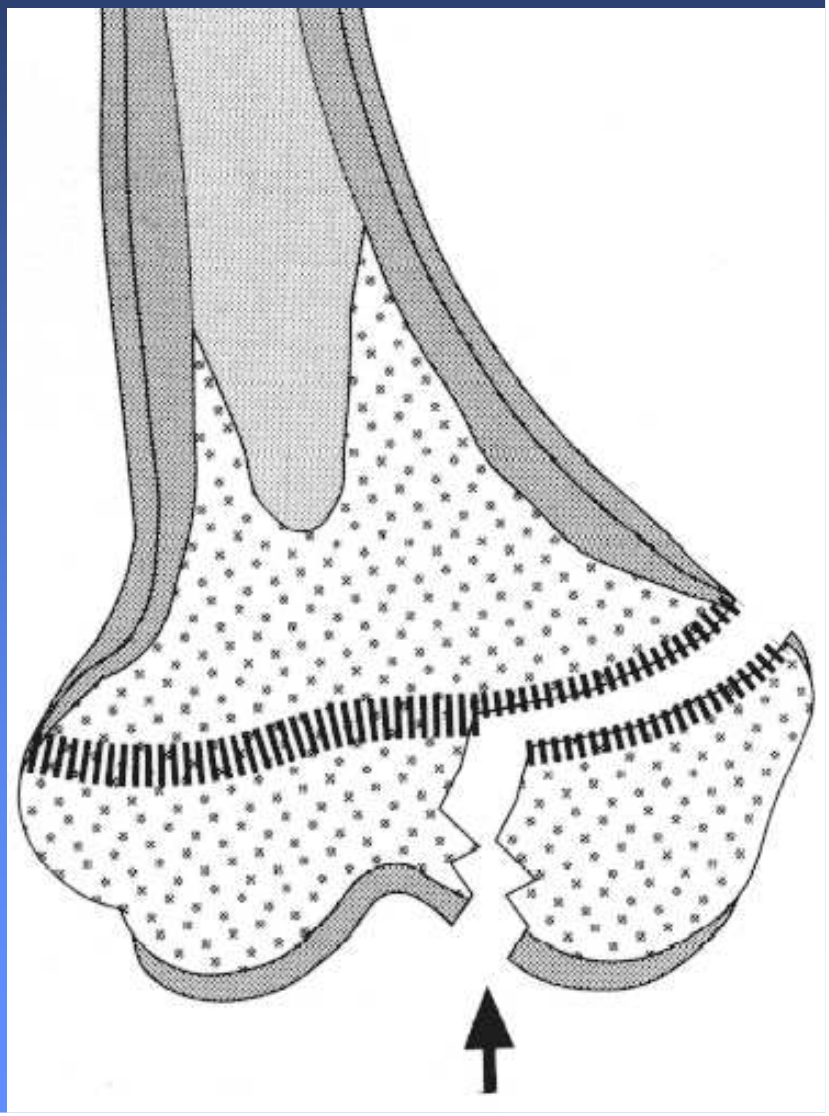
Tibia proximal SH-II



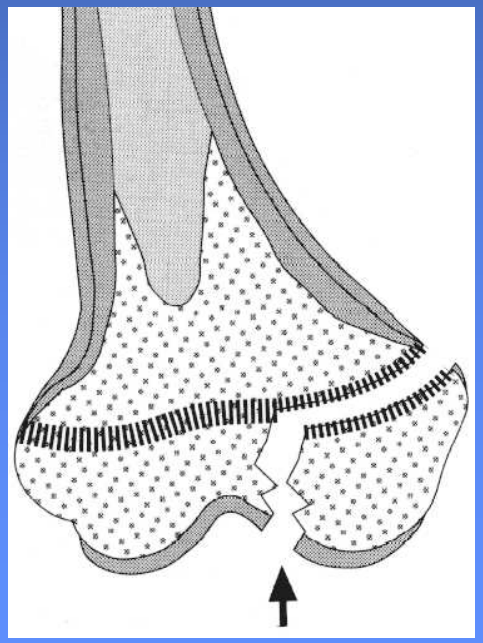


SH-III.

- **Intraarticular fracture**

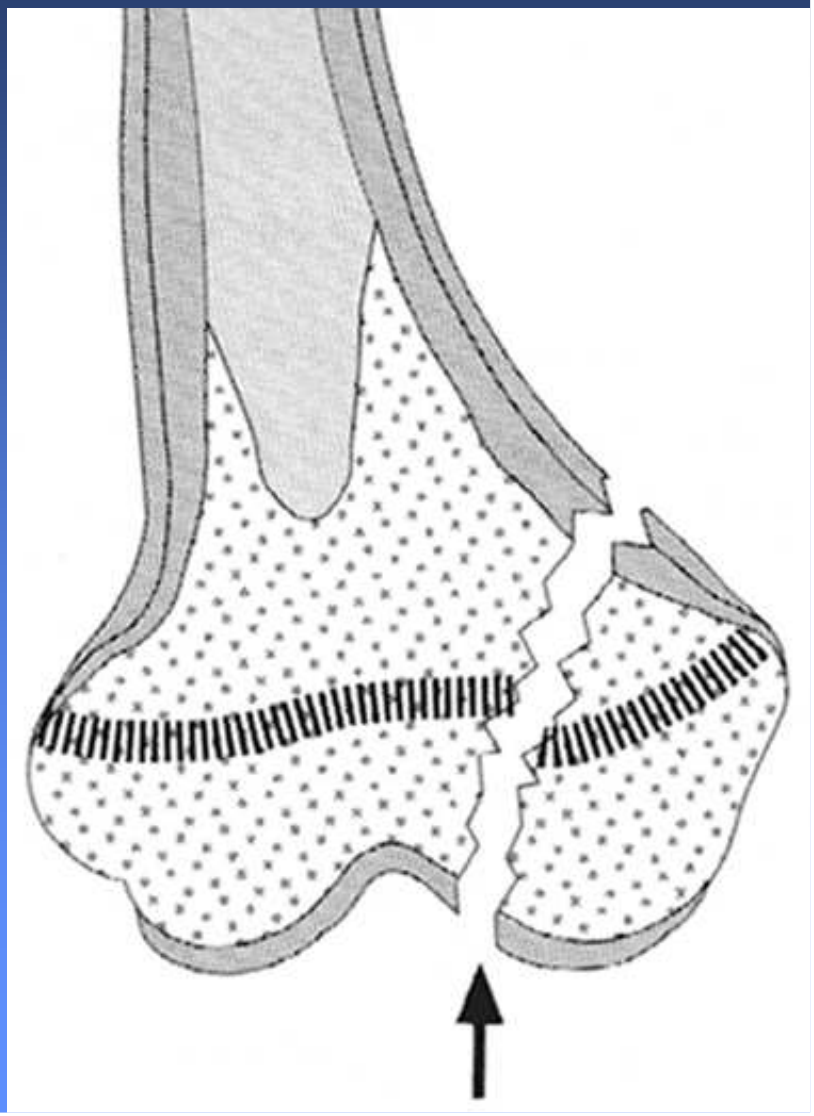


Humerus distal SH-III.

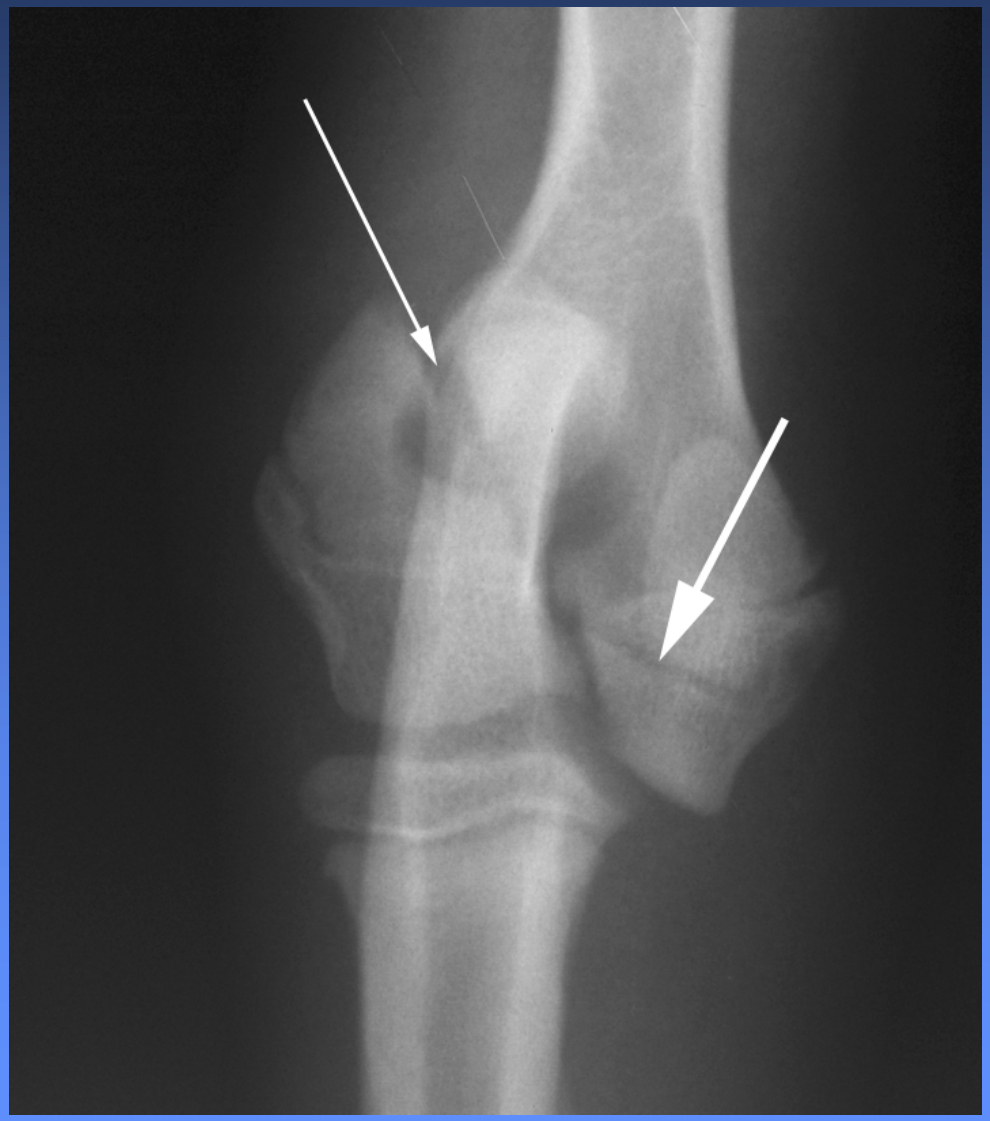


SH-IV.

- **Intraarticular fracture**



Humerus distal SH-IV.

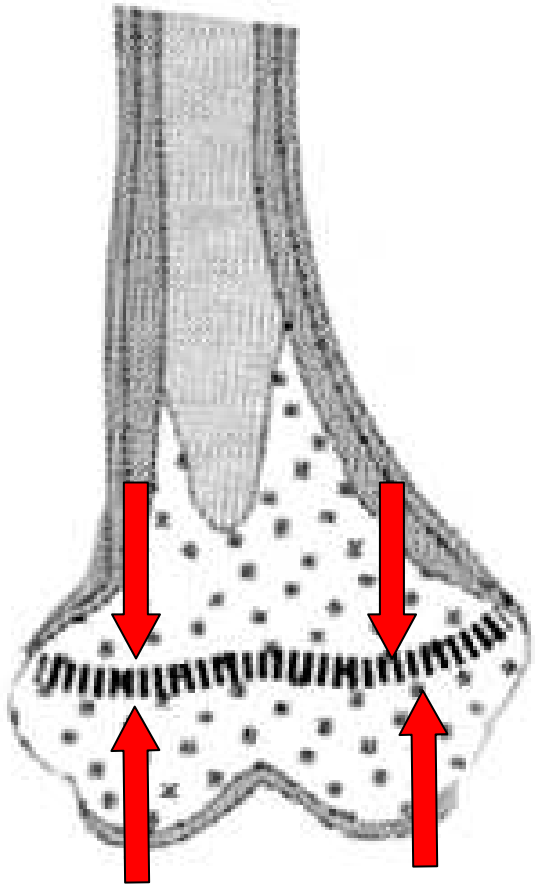


SH-V.

- No fracture line,

  no separation
- Only pain
- Repeat the X-ray

  after 2-3 weeks



Tibia prox. SH-V.

Tibia prox.
SH-V?

SH-V.

- **The prognosis depends on the growing potential and localisation**
- **Therapy:**

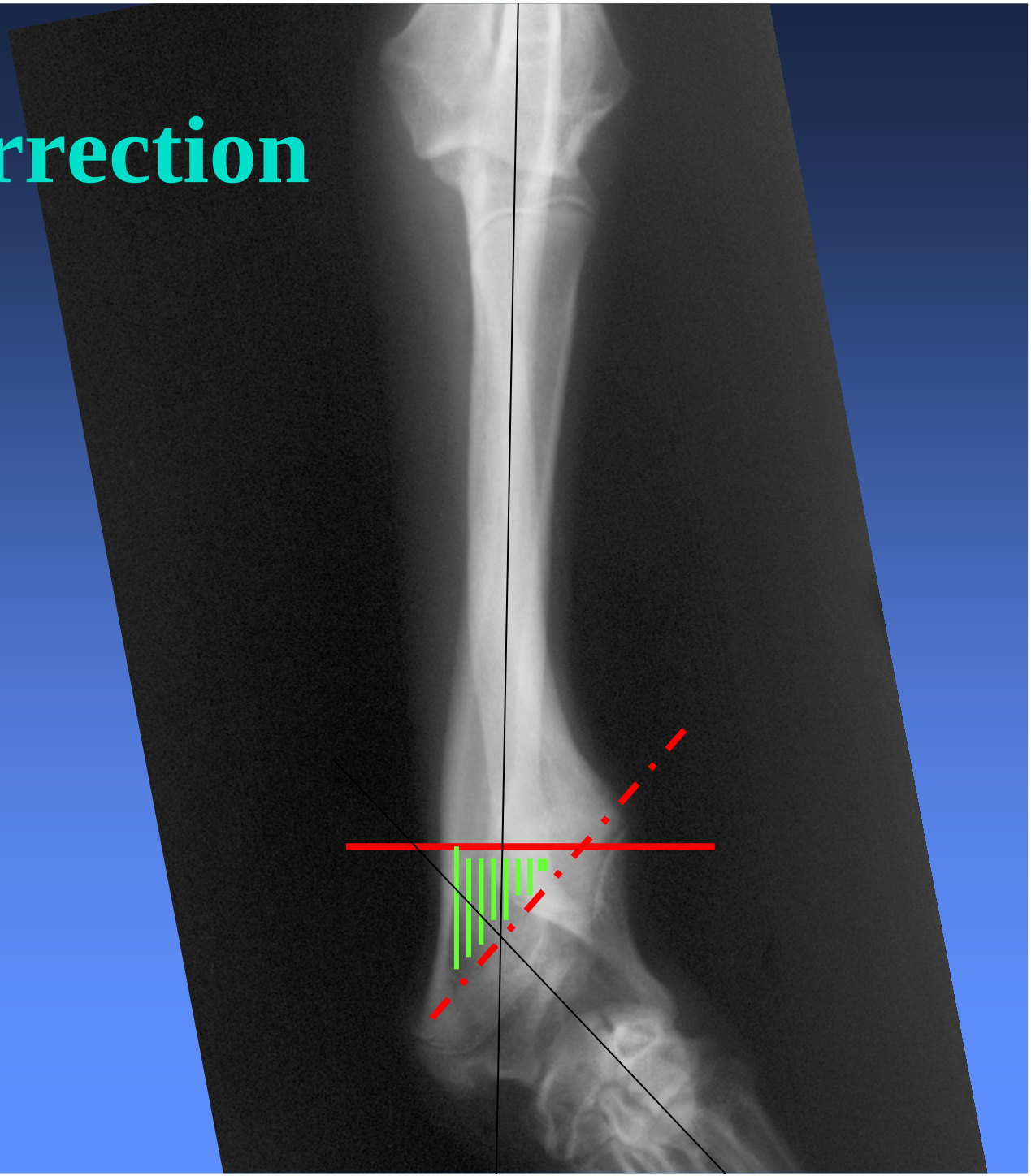
  Fresh cases: splinted bandage, rest NSAIDs

  Later: correcting the deformities

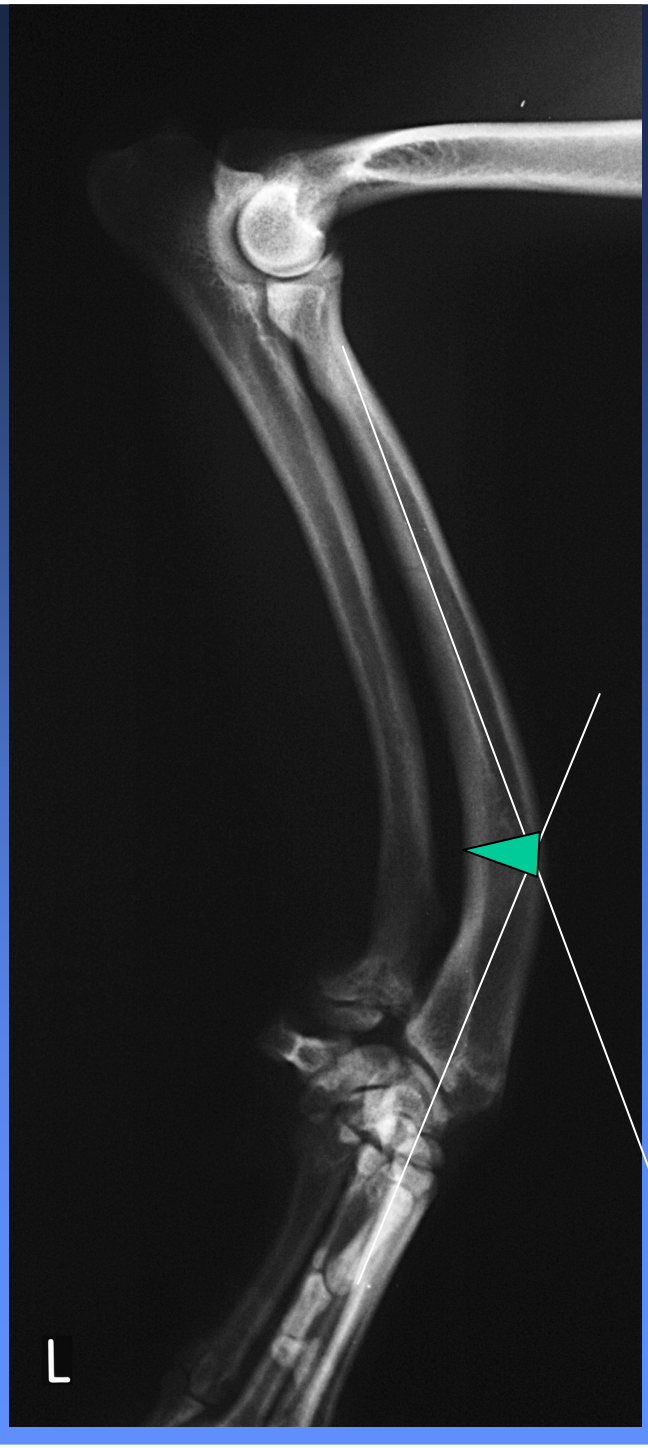
Radius-Ulna deformity (SH-V)

Radius-Ulna deformity (SH-V)
Piri (kuvasz 7month ♀)

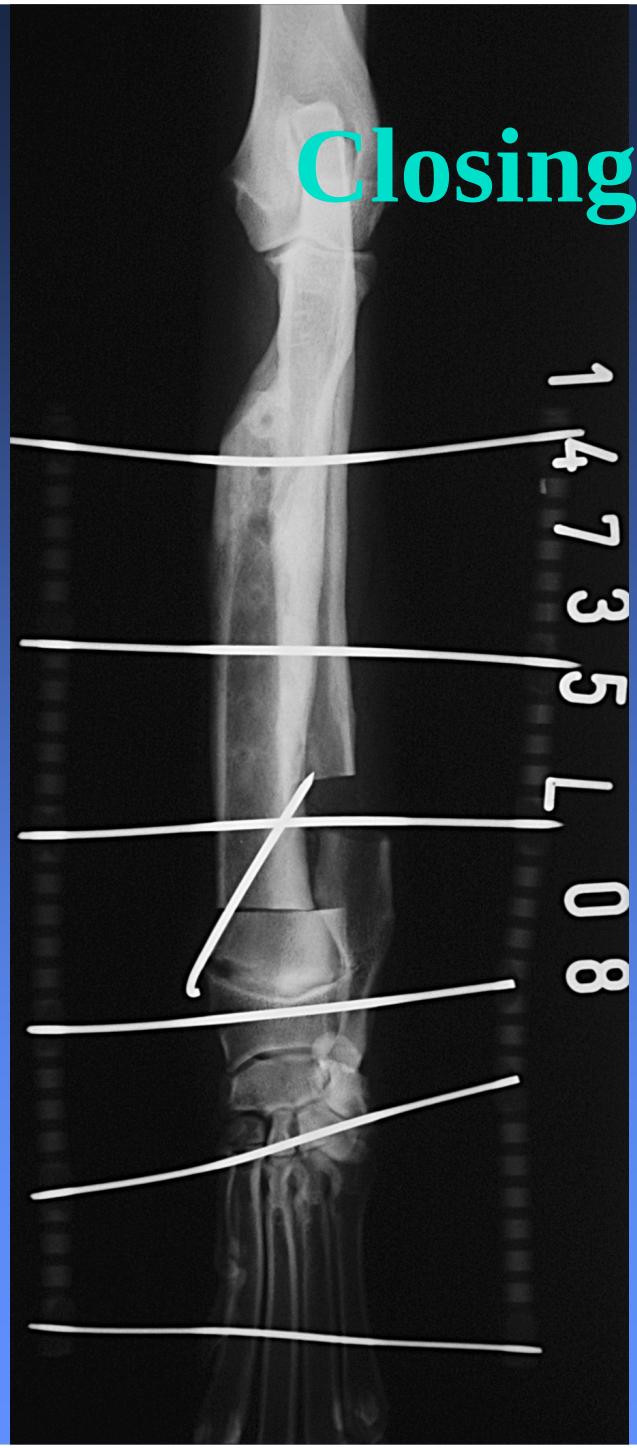
Valgus correction

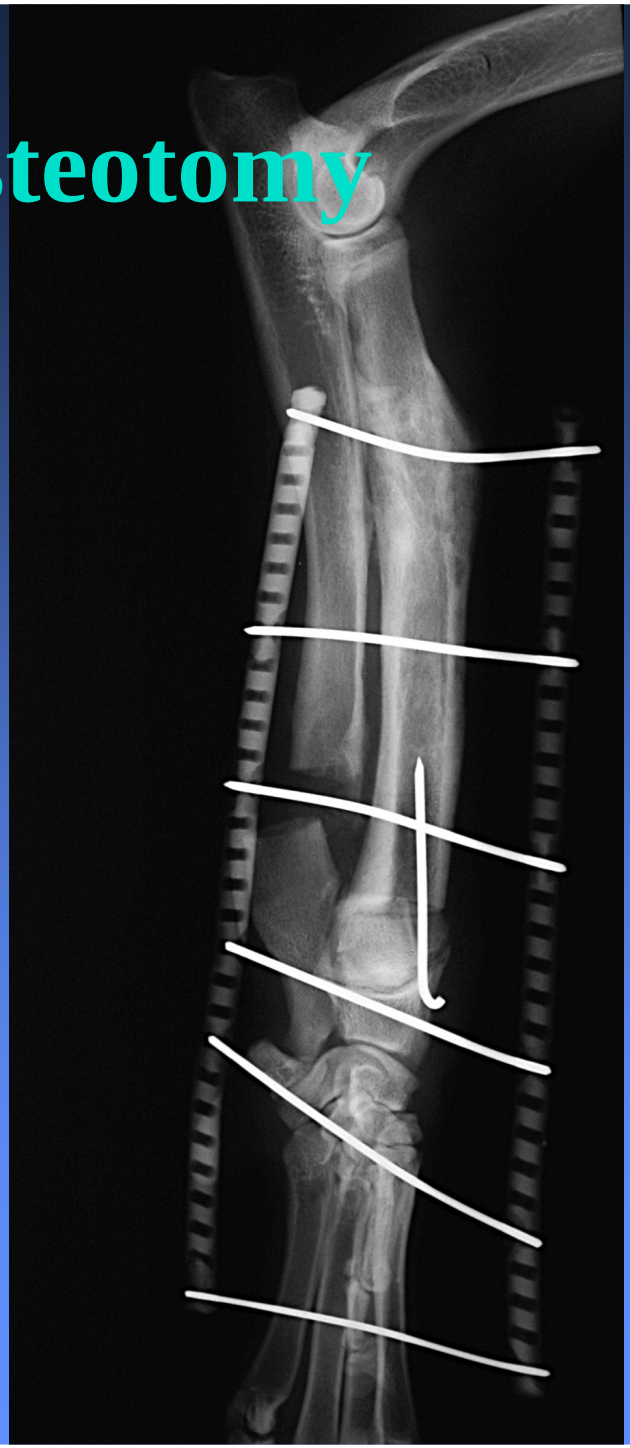


A-P correction



Closing wedge-osteotomy





Piri
before and after

SH I-IV. diagnostics

- **Trauma in history**
- **Swelling close to a joint**
- **Pain**
- **Loss of function**

Crepitation is not typical!

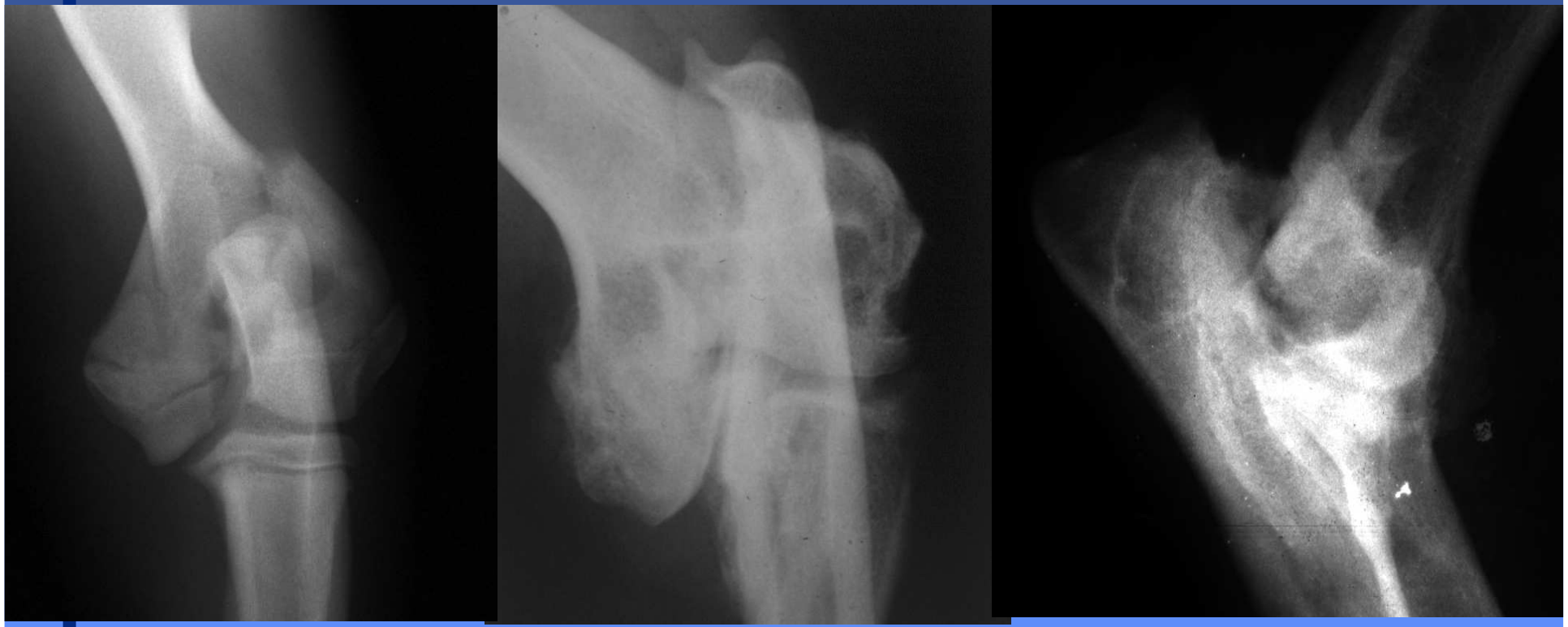
The therapeutic aspects of SH I-IV. fractures

- **<u>Absolute indication for surgery</u>**

- **Op.: -within 3-5 days**
  -small implants perpendicularly to the growing plate (adaptation osteosynthesis)

- **A plate or screw should never cross the epiphyseal plate**

The spontaneous healing is not acceptable



Conservative fracture treatment

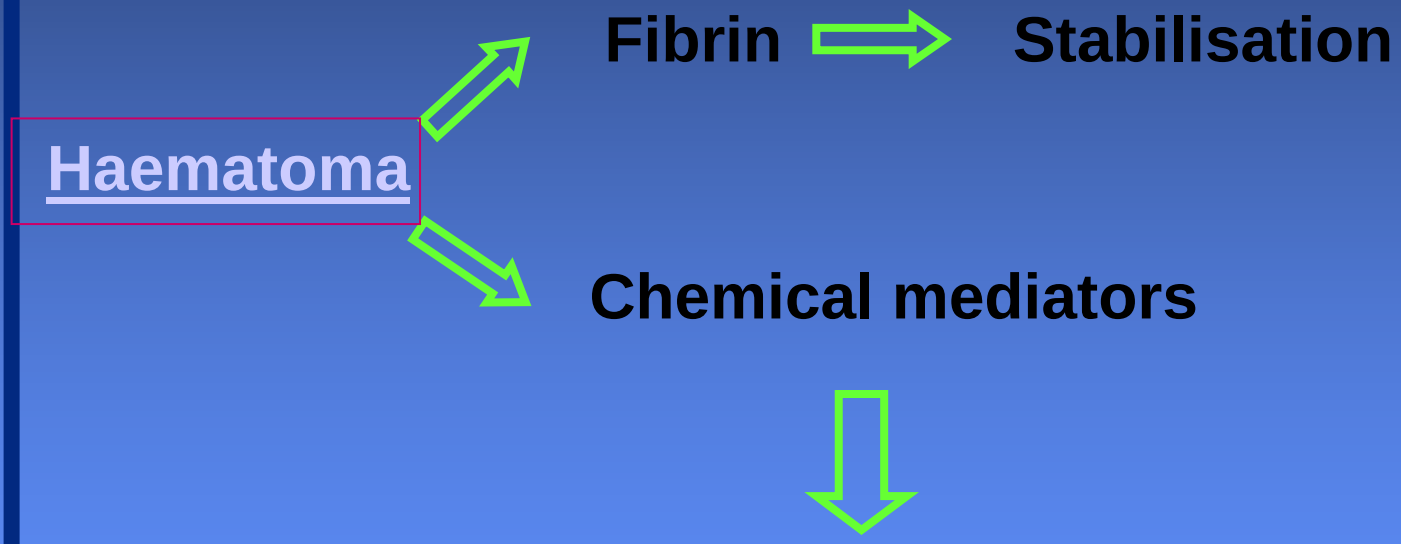
The healing process starts immediately

Force ⇒ **bone and soft tissue**

⇓

HAEMATOMA

The healing process



The mesenchimal cells

- Traction ⇨ Fibroblast
- Compression ⇨ Osteoblast
- Lack of Oxigen ⇨ Chondroblast

The healing process

Peri- and endosteum

- **Vascular buds**

⇩

Vascularisation

- **Osteogenetic tissues**

⇩

- **internal and external callus**

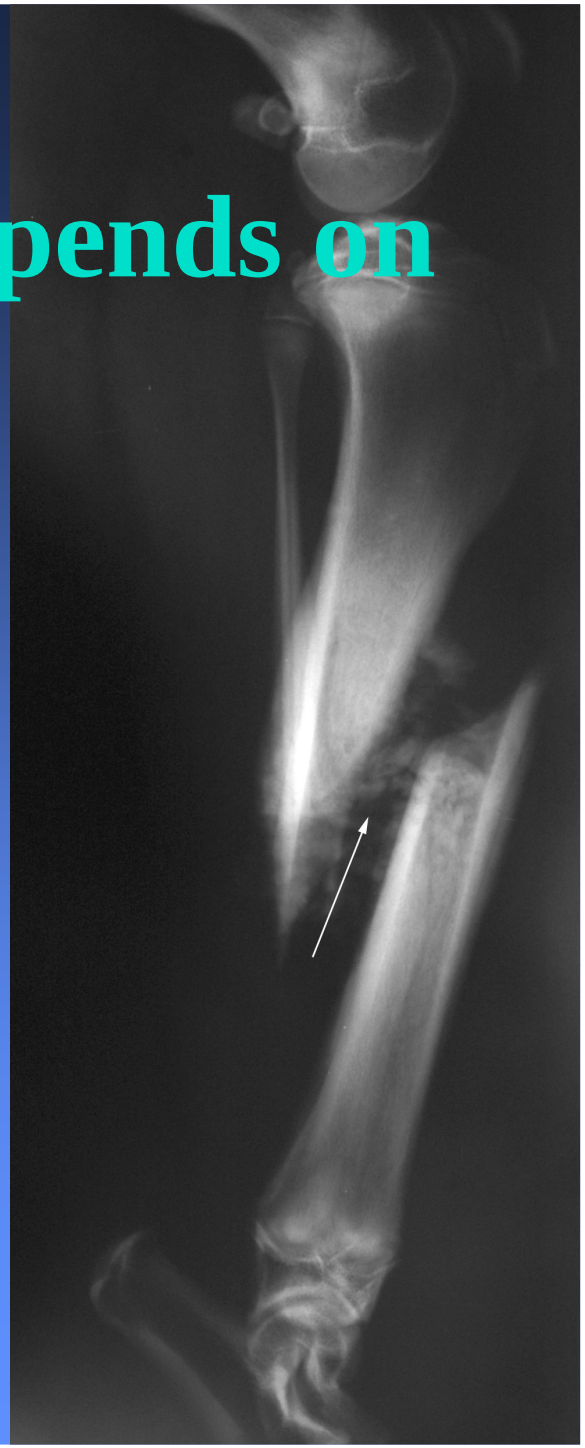
Aim: to help the healing process

- To antagonise the traction
- To protect the vascularity
- To assist the osteogenetic process

Stabilisation

The fracture healing depends on

- age
- fractur type
- soft tissue damage
- stability of the fixation
  - external - internal fixation
  - surgical - non-surgical therapy



Delaying the fracture healing

- unstable fixation
- too wide fracture gap
- severe soft tissue damage
- Infection
- poor general condition
- drugs (steroids)

The fracture treatment can be

- conservative
- surgical

The types of Conservative fract. management

- „Cage rest”
- Padded bandage
- Splinted bandage
- Casts

Conservative fracture management

Indication:

- Age
- Fracture type
- Locus

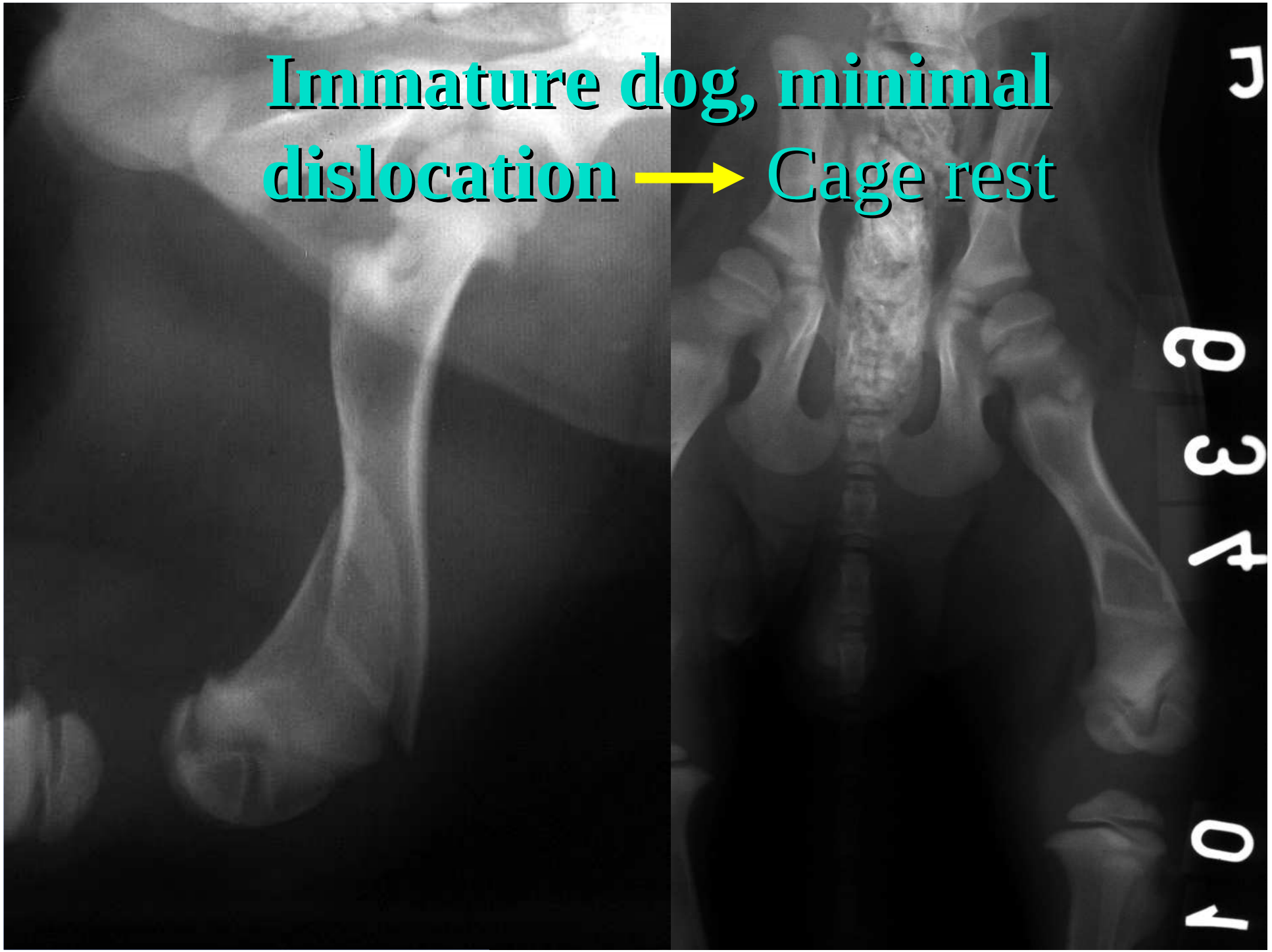
Perform:

- Adequate method
- Correct application
- Regular control

Indications for „Cage rest”

- Young age
- Incomplete fracture
- Minimally disloceted, stable fracture

Greenstick fr. and Infraction


Immature dog, minimal dislocation → Cage rest

Conservative fracture management
Bandage types

Padded bandages,

Splinted bandages,

Casts

Padded bandages

- Mainly for soft tissue protection (first aid)
- Goog absorbent
- Diminish swelling

Padded bandages

- Contact layer
- Padding layer
- Compression layer
- Outer layer

Padded bandages

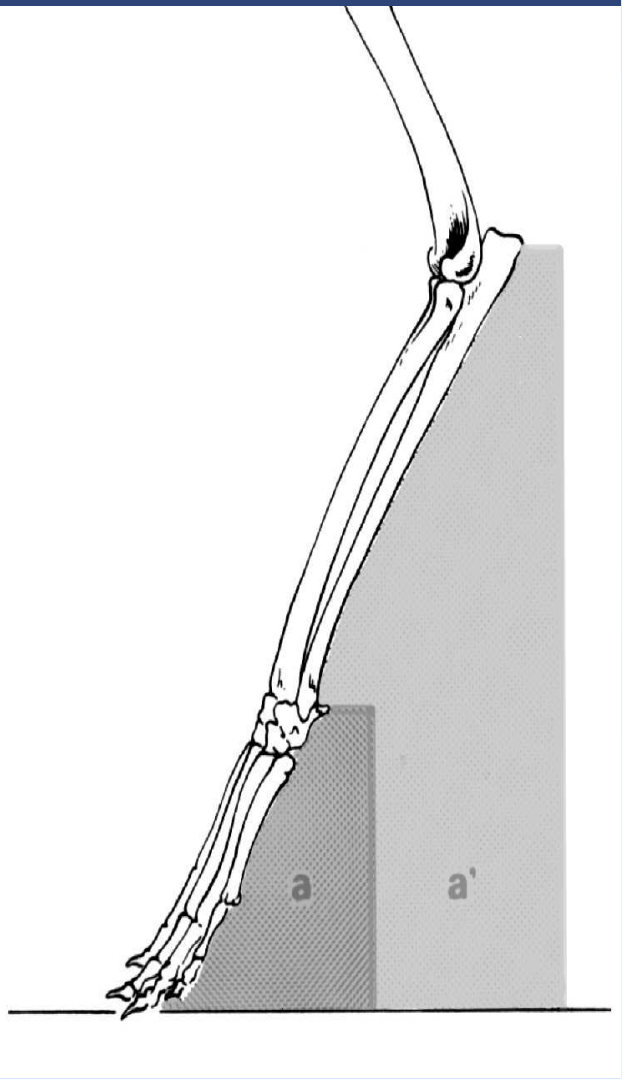
Padded bandages

Conservative fracture treatment splinted bandages indication:

- Fractures distal to the elbow and knee
- Simple, relatively stable after reposition

Splinted bandages

- The frtacture should be at the middle of the bandage
- The bandage extends from the toes to the middle of radius/tibia, humerus/femur
- The splints end 1,5-2 cm from the edge

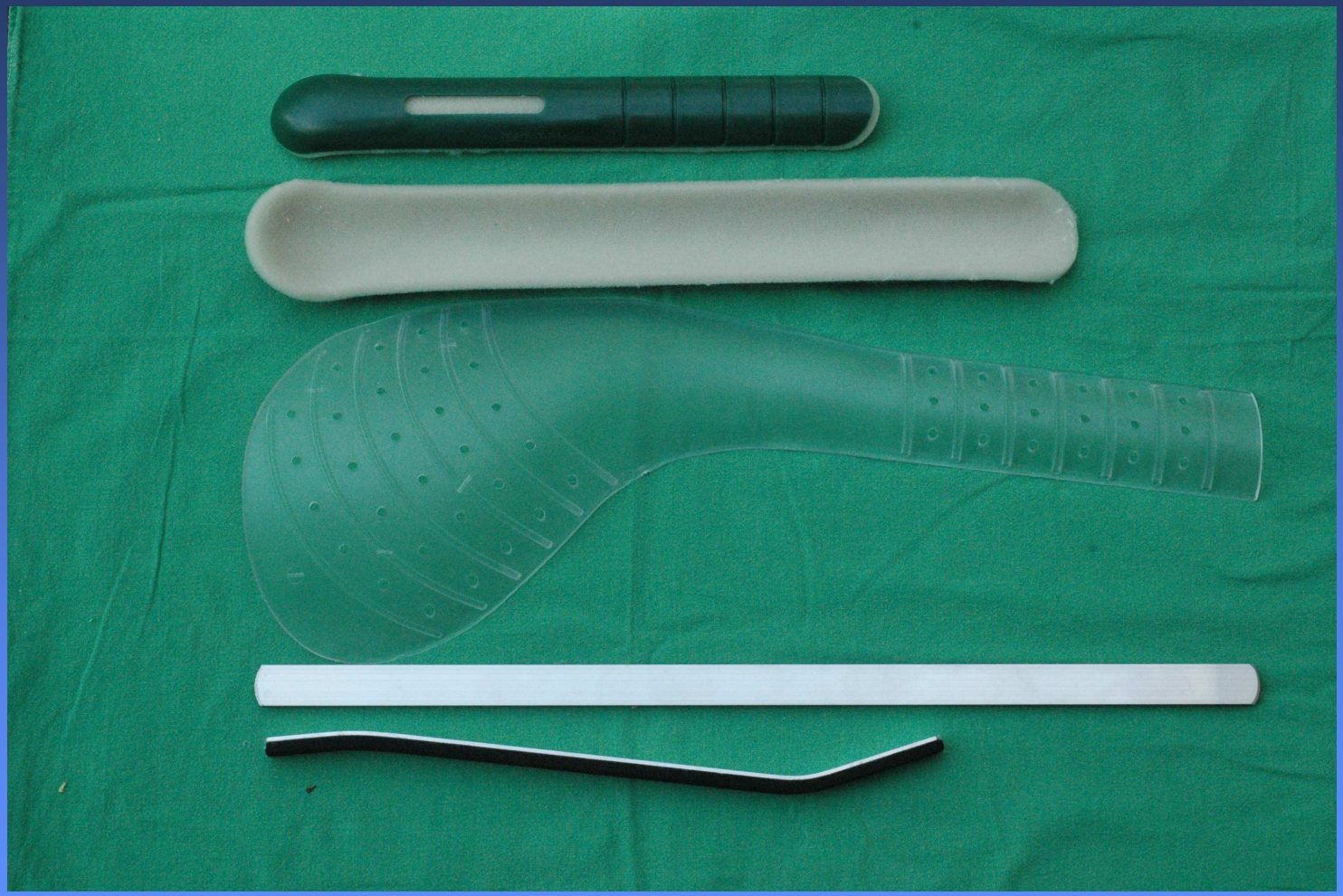


Anatomy of splinted bandages

- Contact layer
- Padding layer
- Compression layer
- Splints
- Outer layer

Splinted bandages

Splints



Splinted bandages

Anatomy of Casts

- Contact layer
- Padding layer
- Compression layer
- Cast layer

The harder and more expensive the cast, the biger the possibility of complications

Application of a cast

Cast removal

Complications associated with bandages

- Swelling
- Dermatitis
- Joint stiffnes /fracture disease/

Kara 1y. mongrel ♀

Kara 1y. mongrel ♀

Kara 1y. mongrel ♀

Handling of bandages

- Restricted activity
- Keeping clean and dry
- Being aware of complications
- Cheques for loosening

Thank You!