

Problems and solutions of using monorail external fixation in the femur

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Conventional external fixator is not stiff enough to control deforming forces in the femur



Circular
fixator is
bulky



Monorail external fixator give stability and comfort for patient



DE BASTIANI MONOLATERAL FRAME

Limb Lengthening by Callus Distraction (Callotasis)

Giovanni De Bastiani, M.D., Roberto Aldegheri, M.D., Lodovico Renzi-Brivio, M.D.,
and Giampaolo Trivella, M.D.

Institute of Clinical Orthopaedics and Traumatology, University of Verona, Verona, Italy



FIG. 1. Diaphyseal limb lengthener (dynamic axial fixation system).



J Pediatr Orthop, Vol. 7, No. 2, 1987

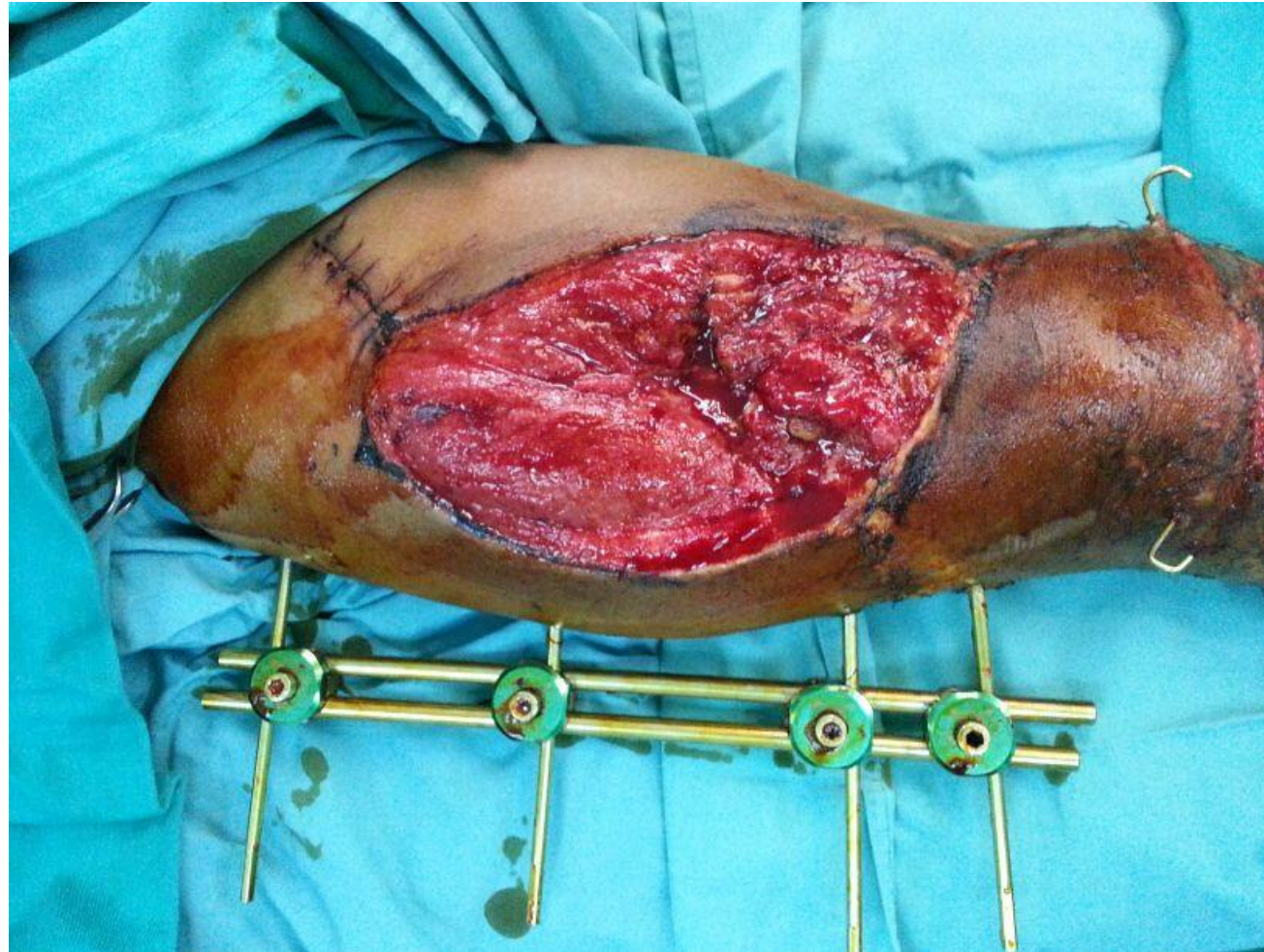
Use for

- Fracture fixation
- Deformity correction
- Bone transport

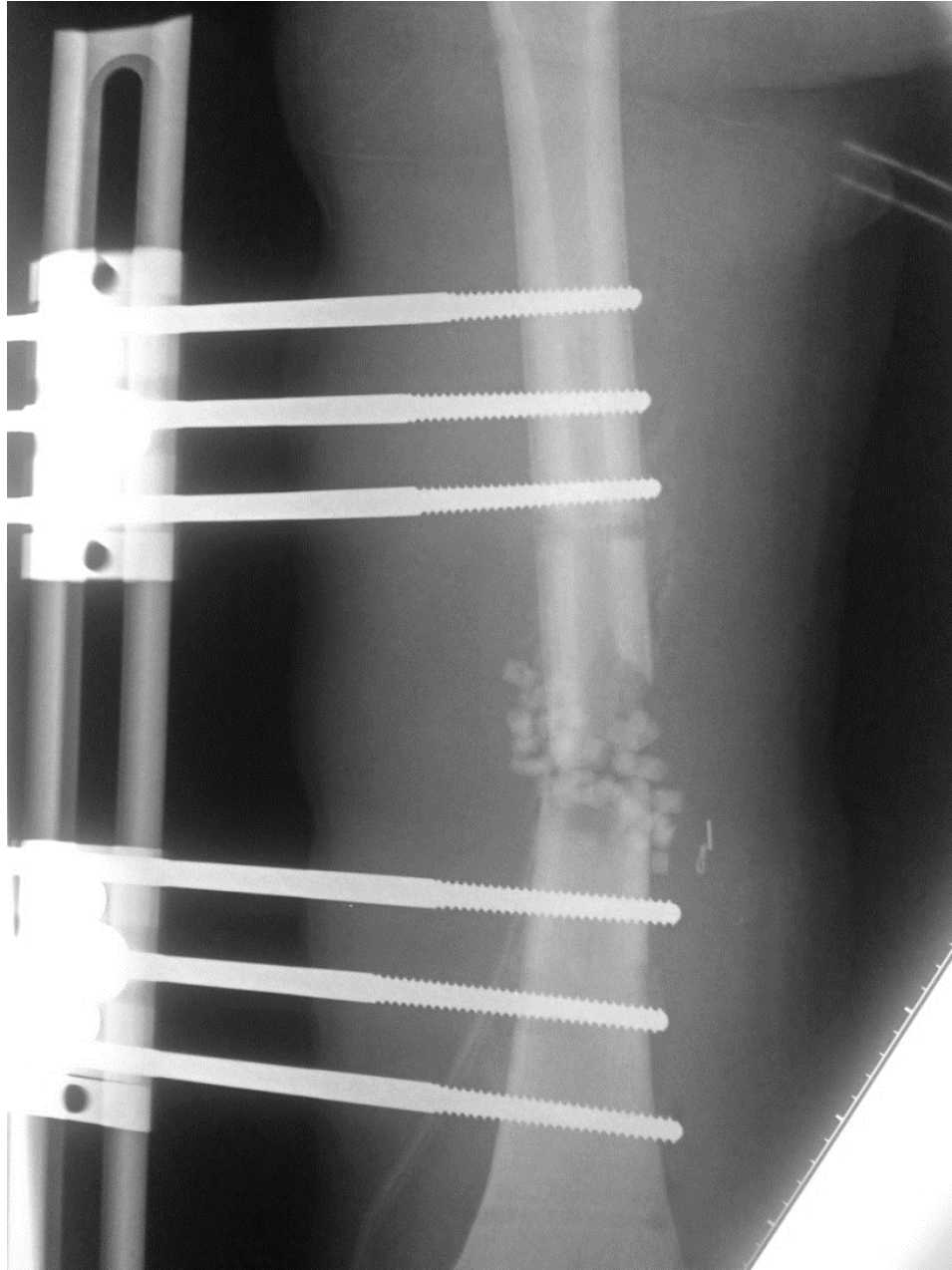
Temporary stabilisation



Definitive fixation



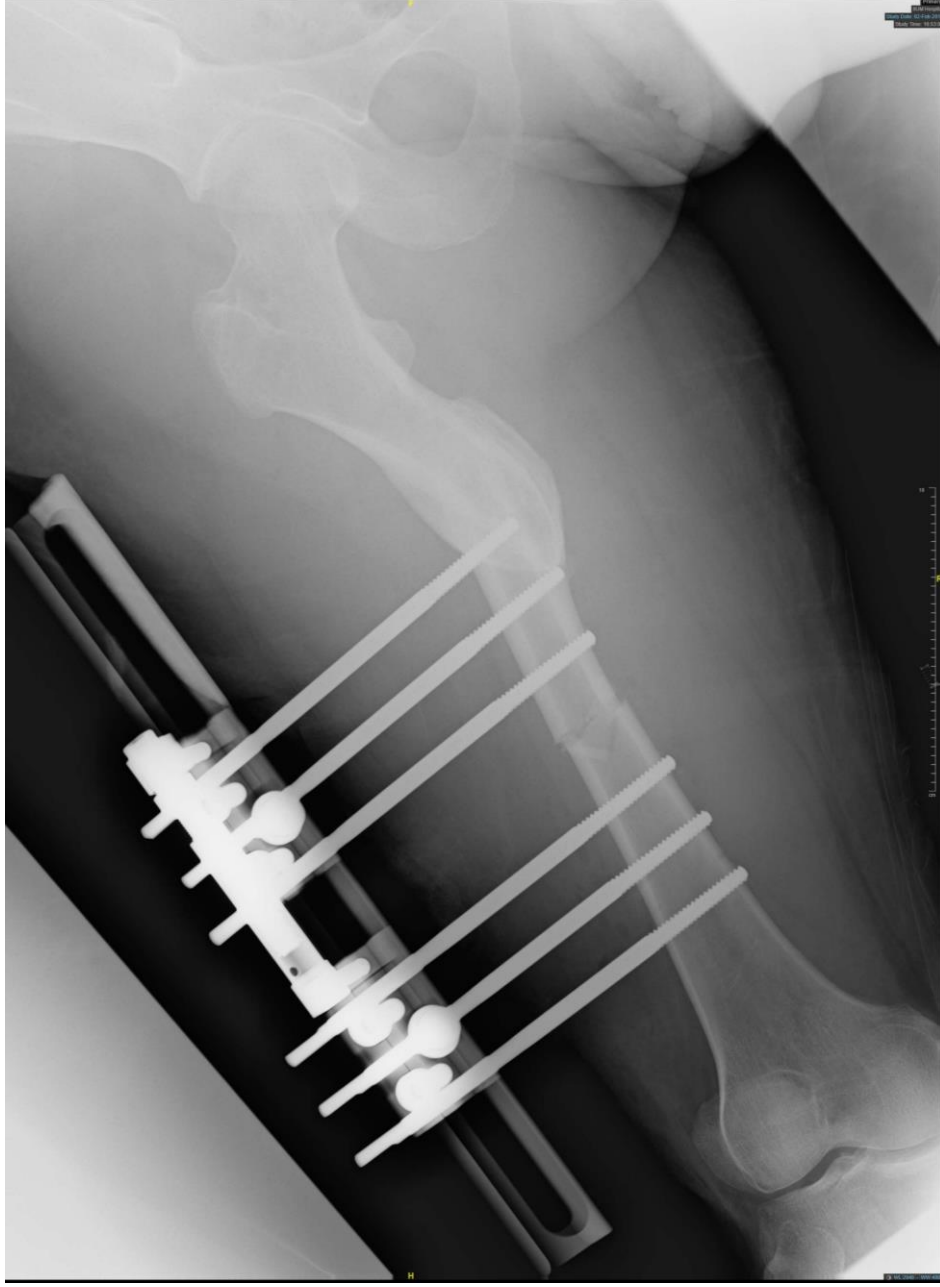




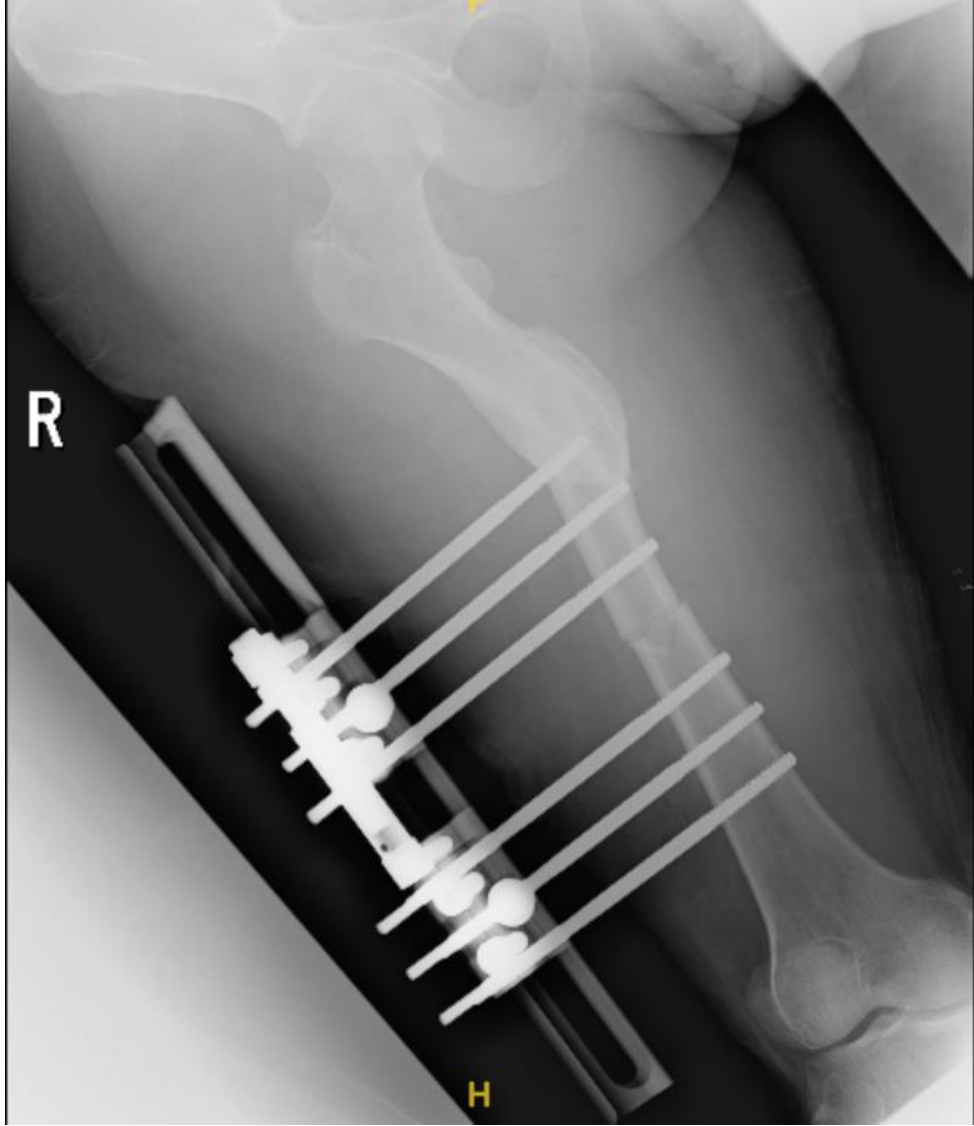
After removal 5 months after injury

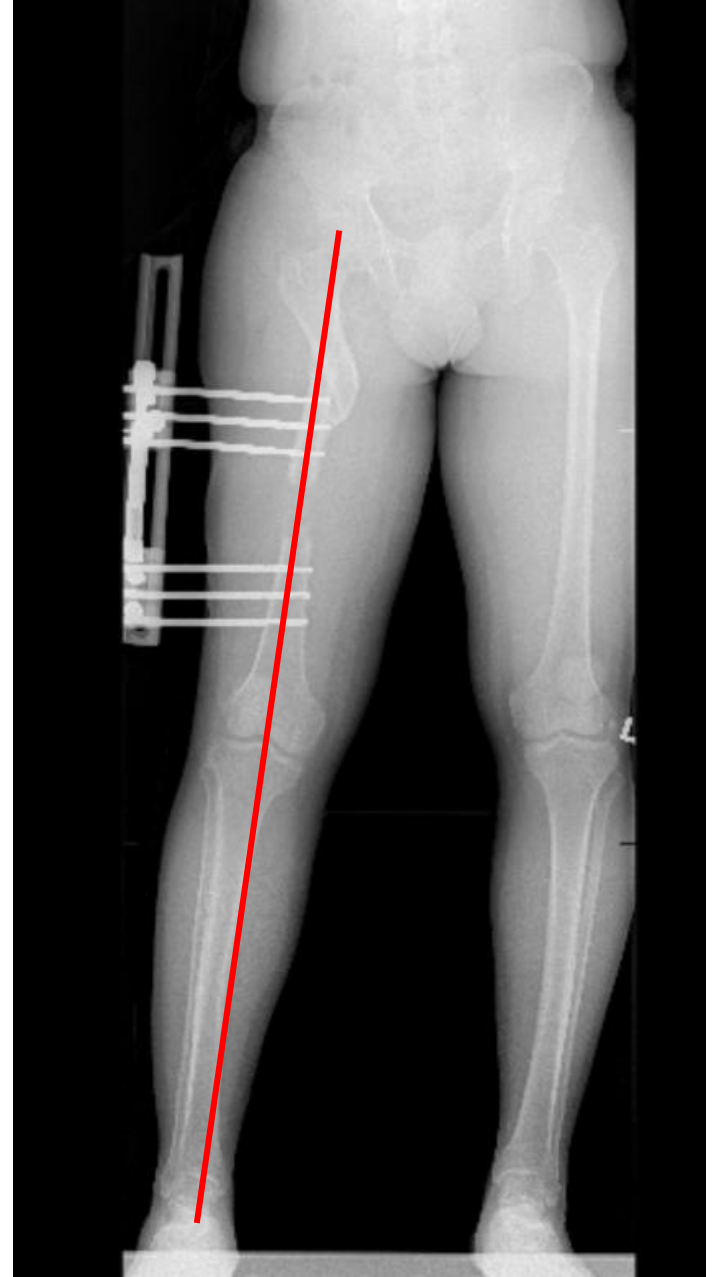
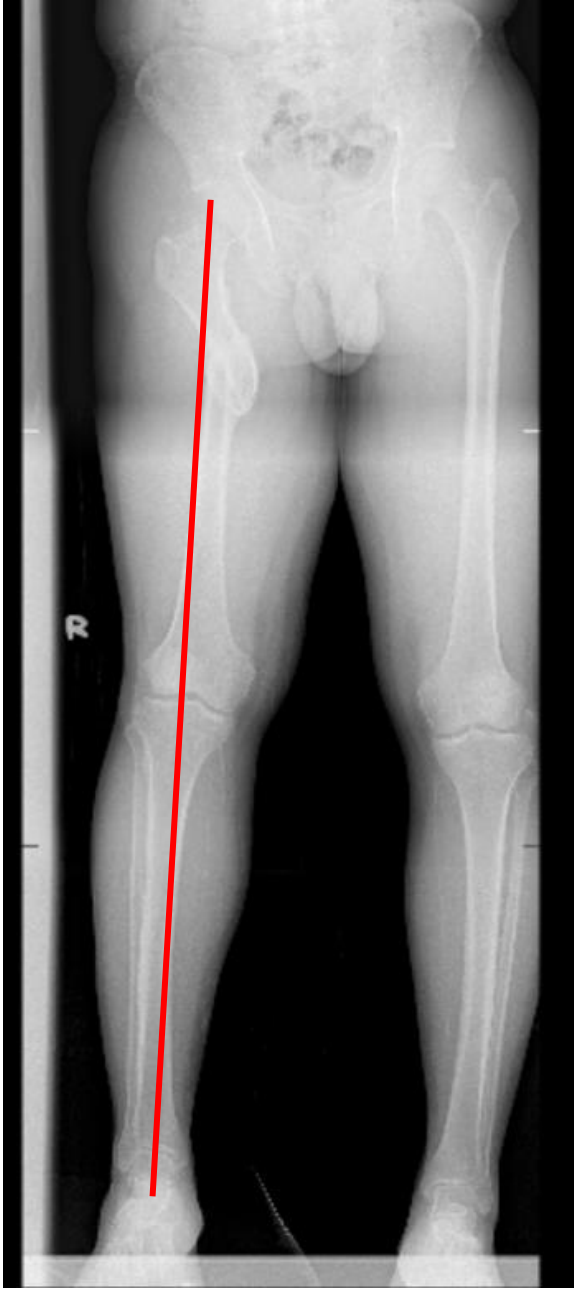


Lengthening





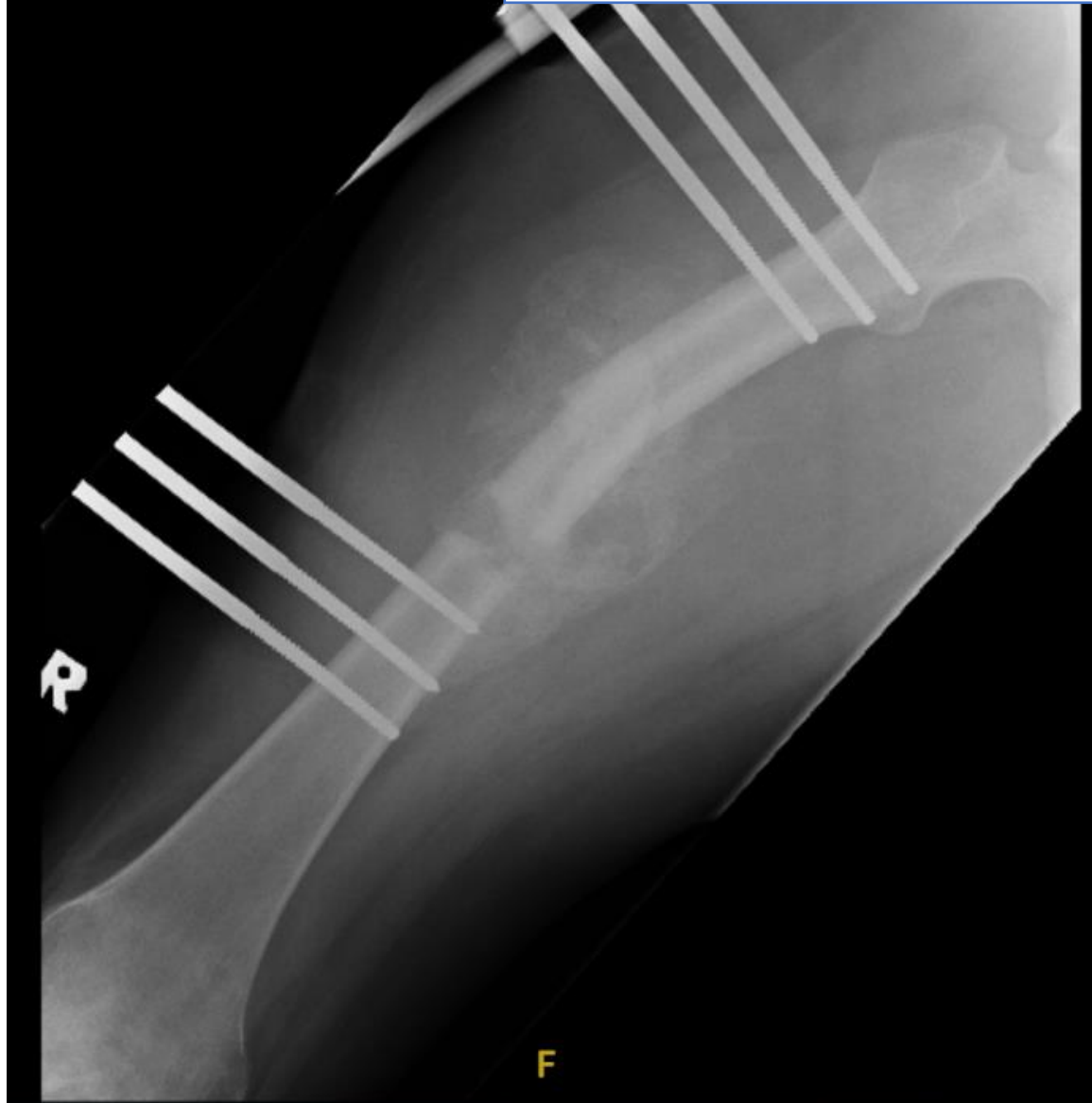


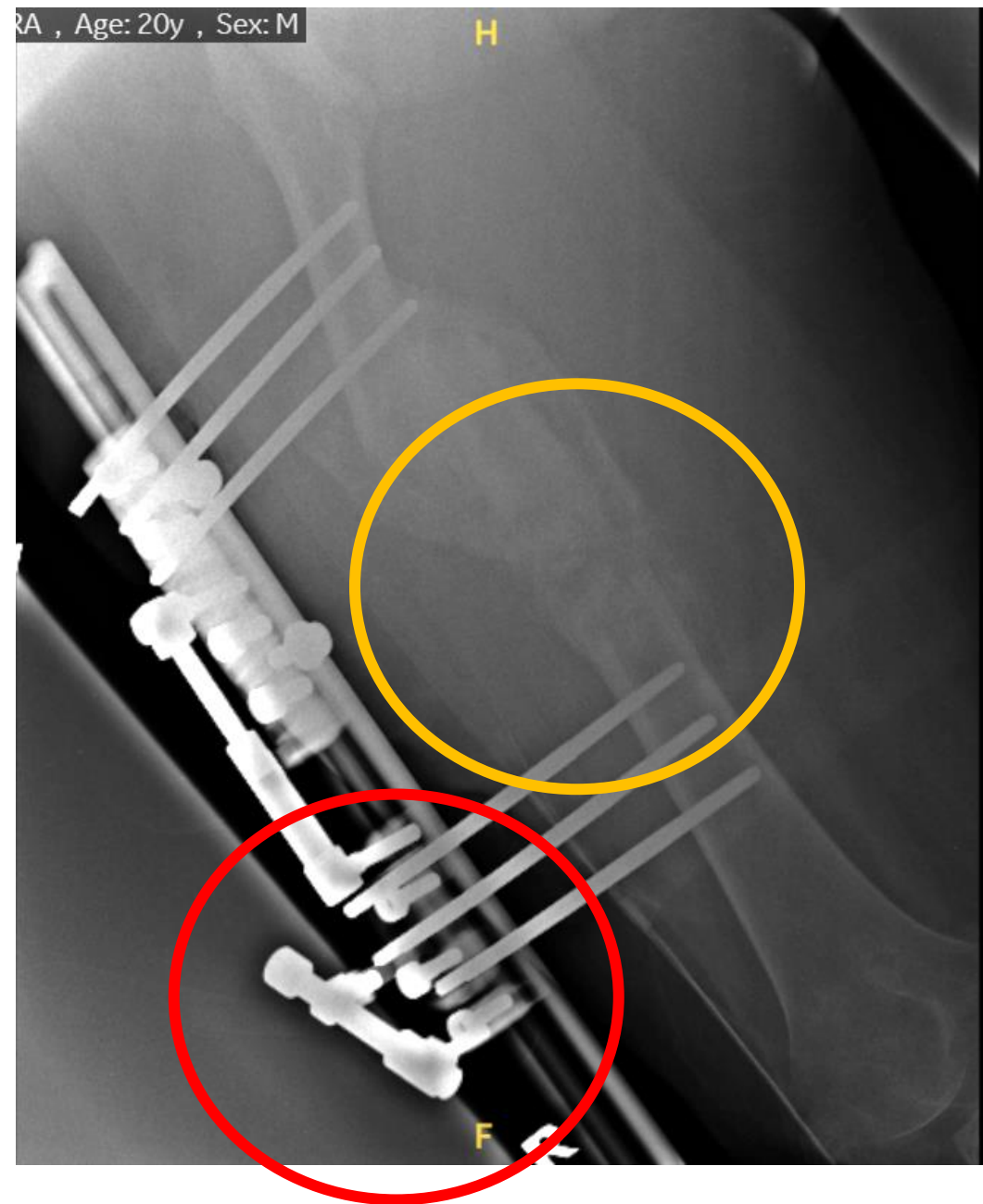
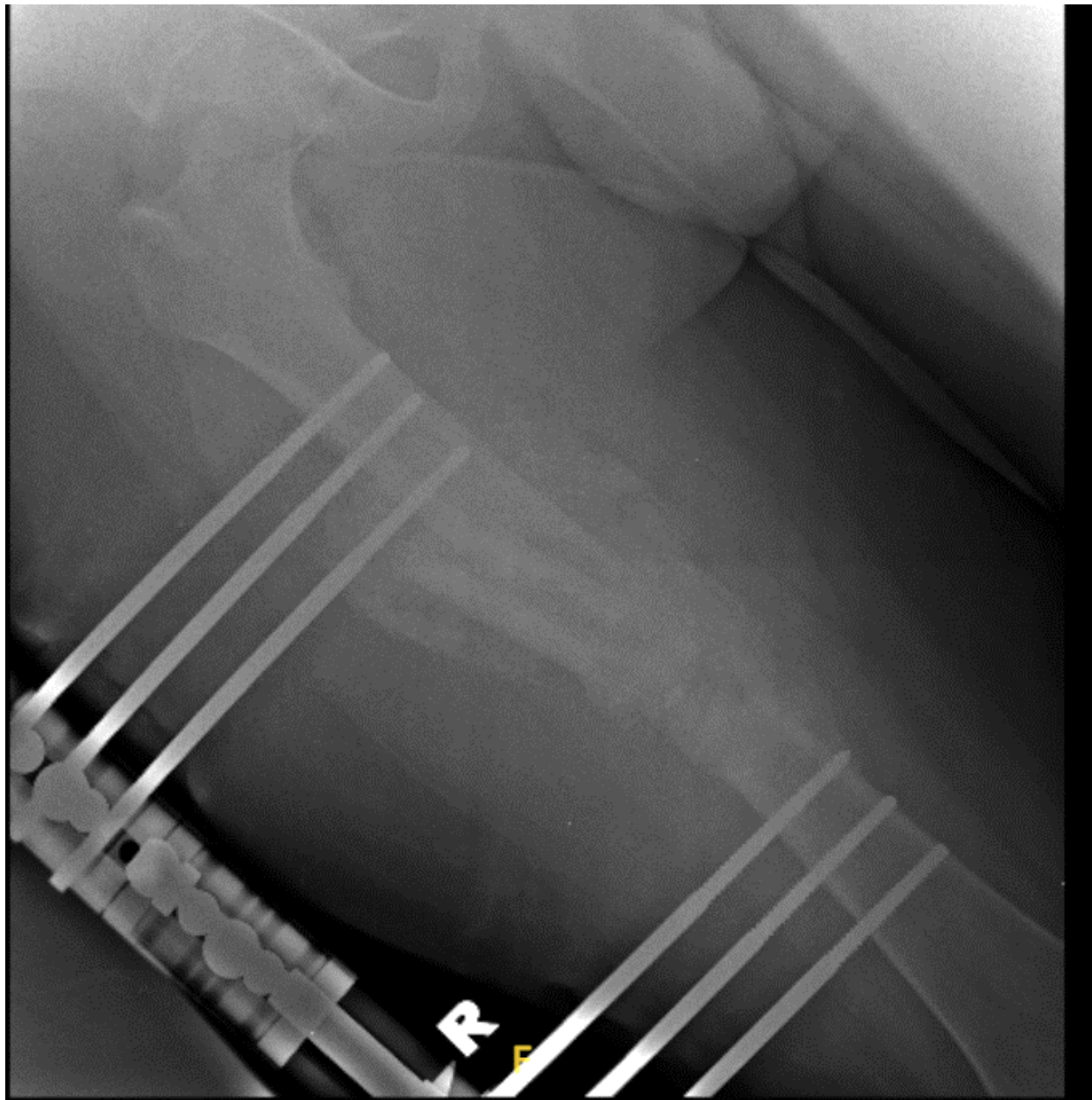


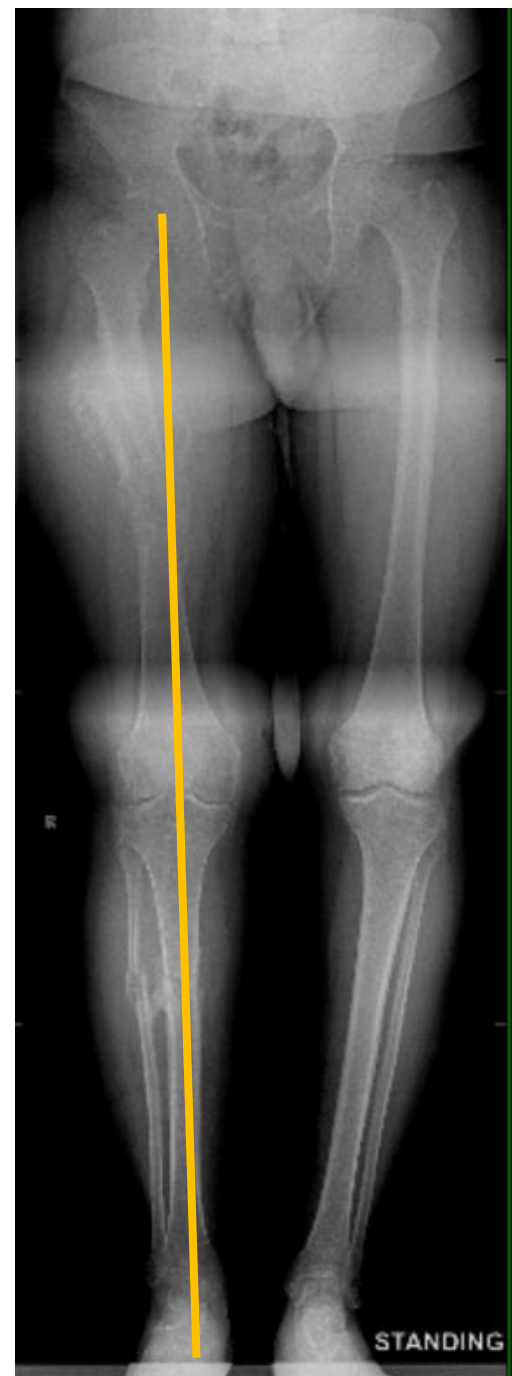
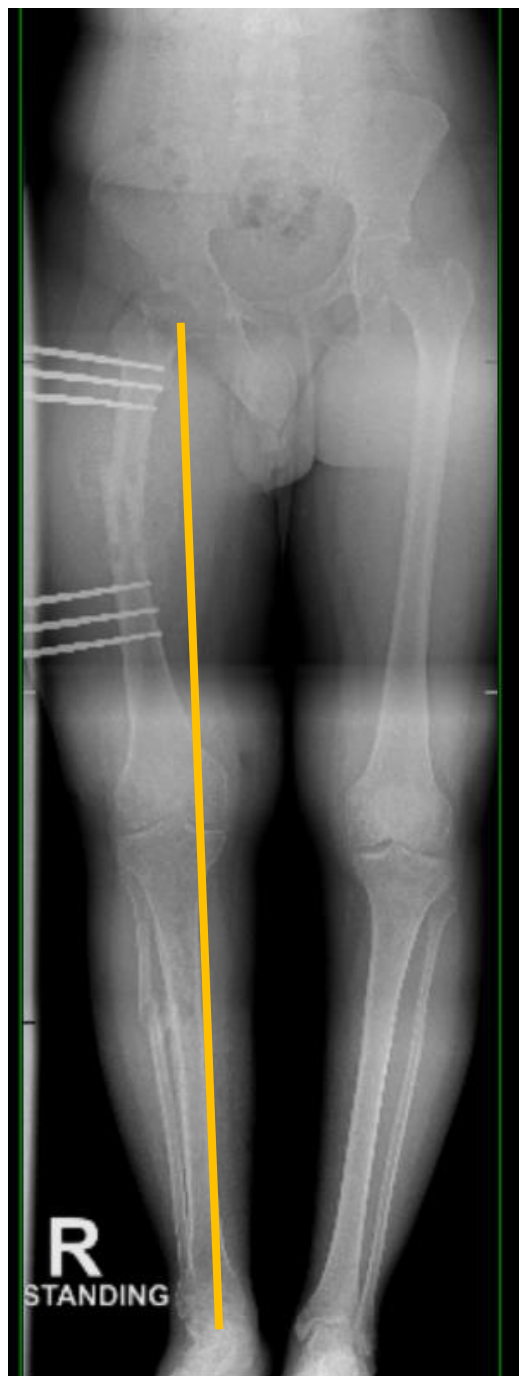


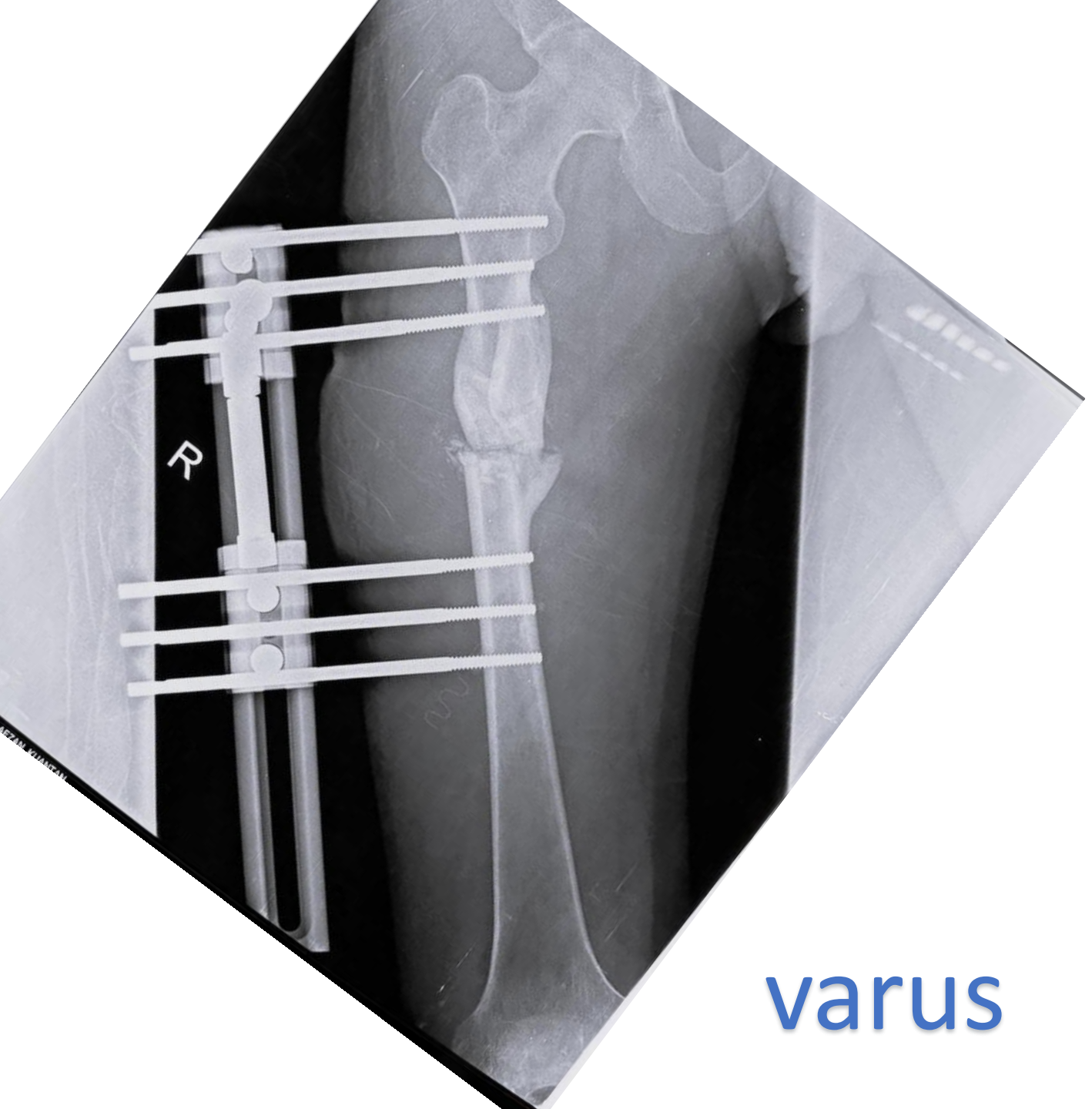
L RA , Age: 20y , Sex: M

Deformity correction

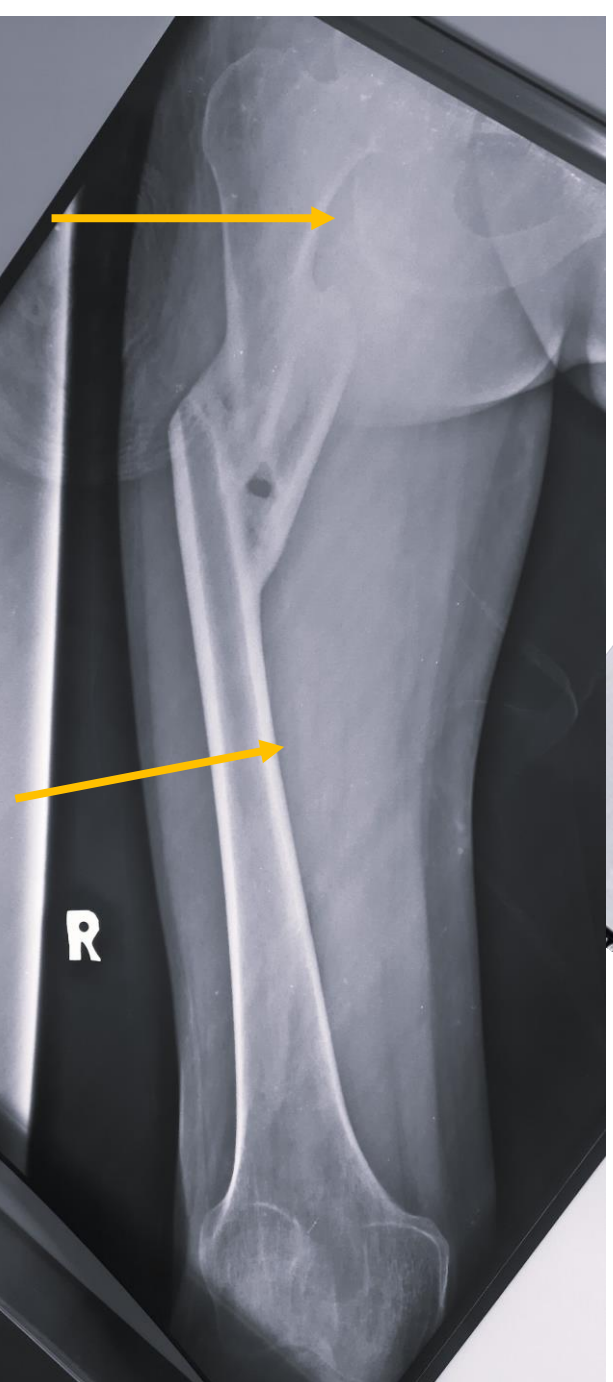






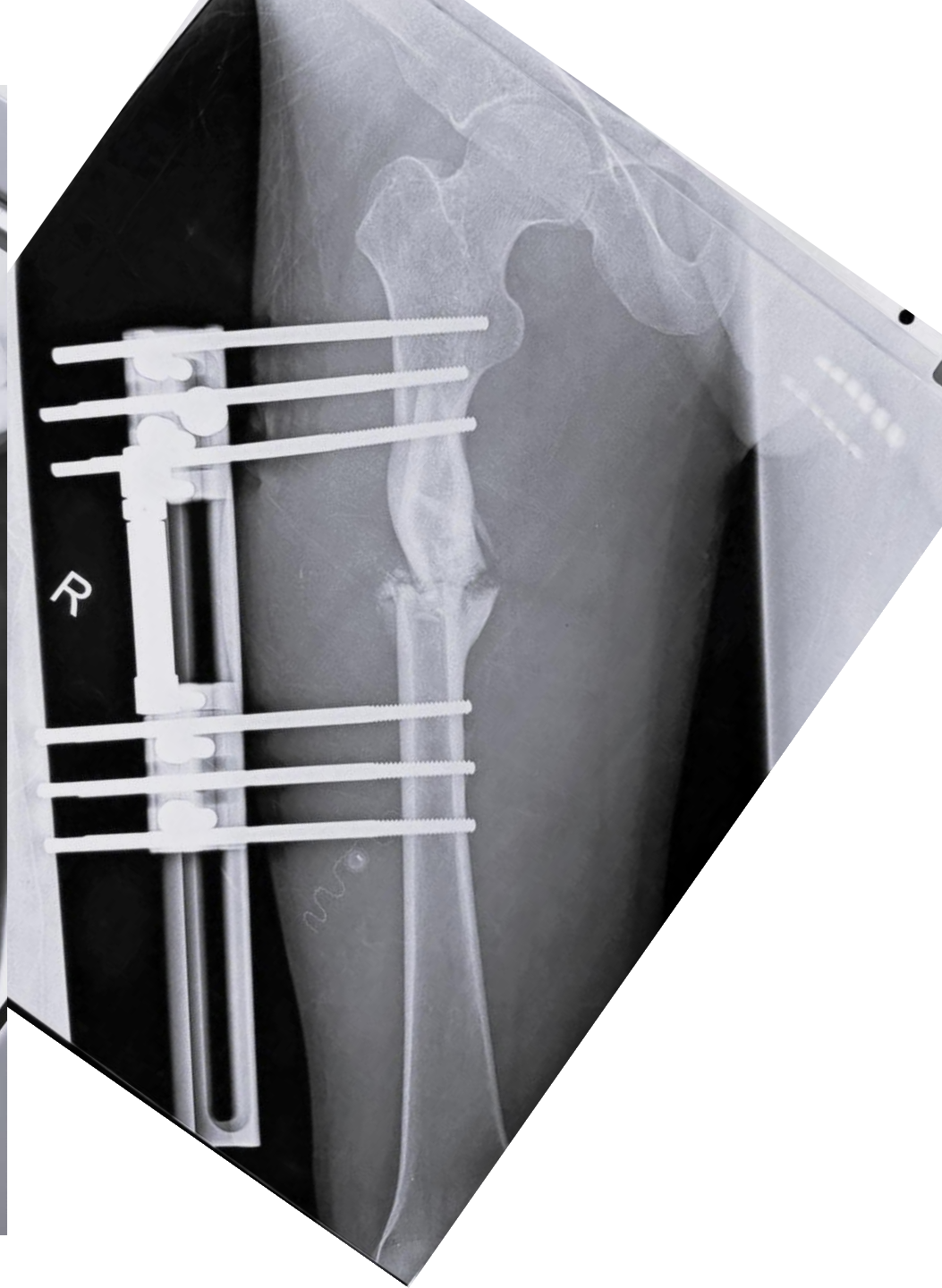


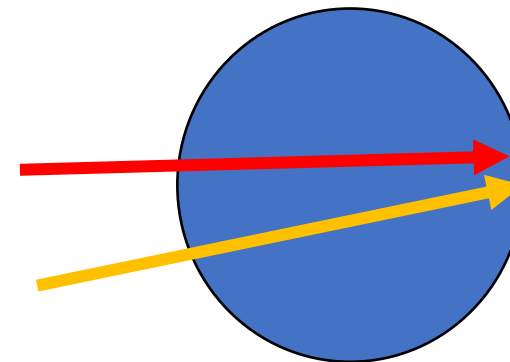
varus



Multipplanar
Deformity correction

Procurvatum





External rotation



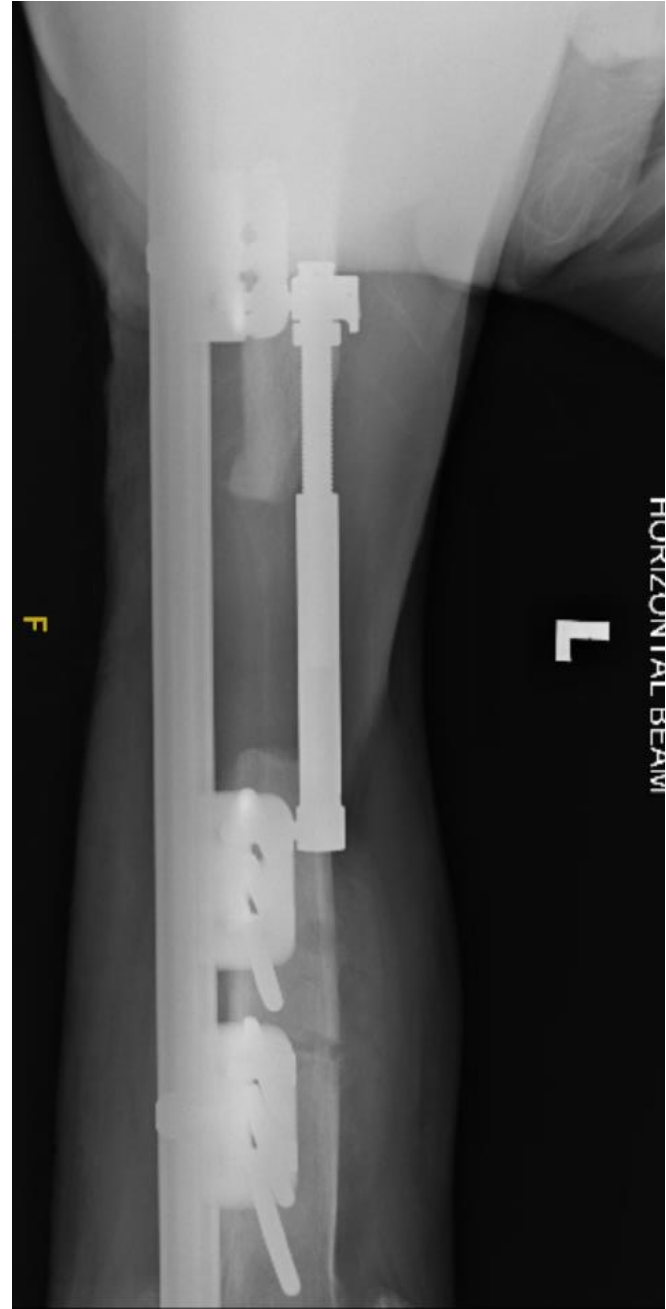
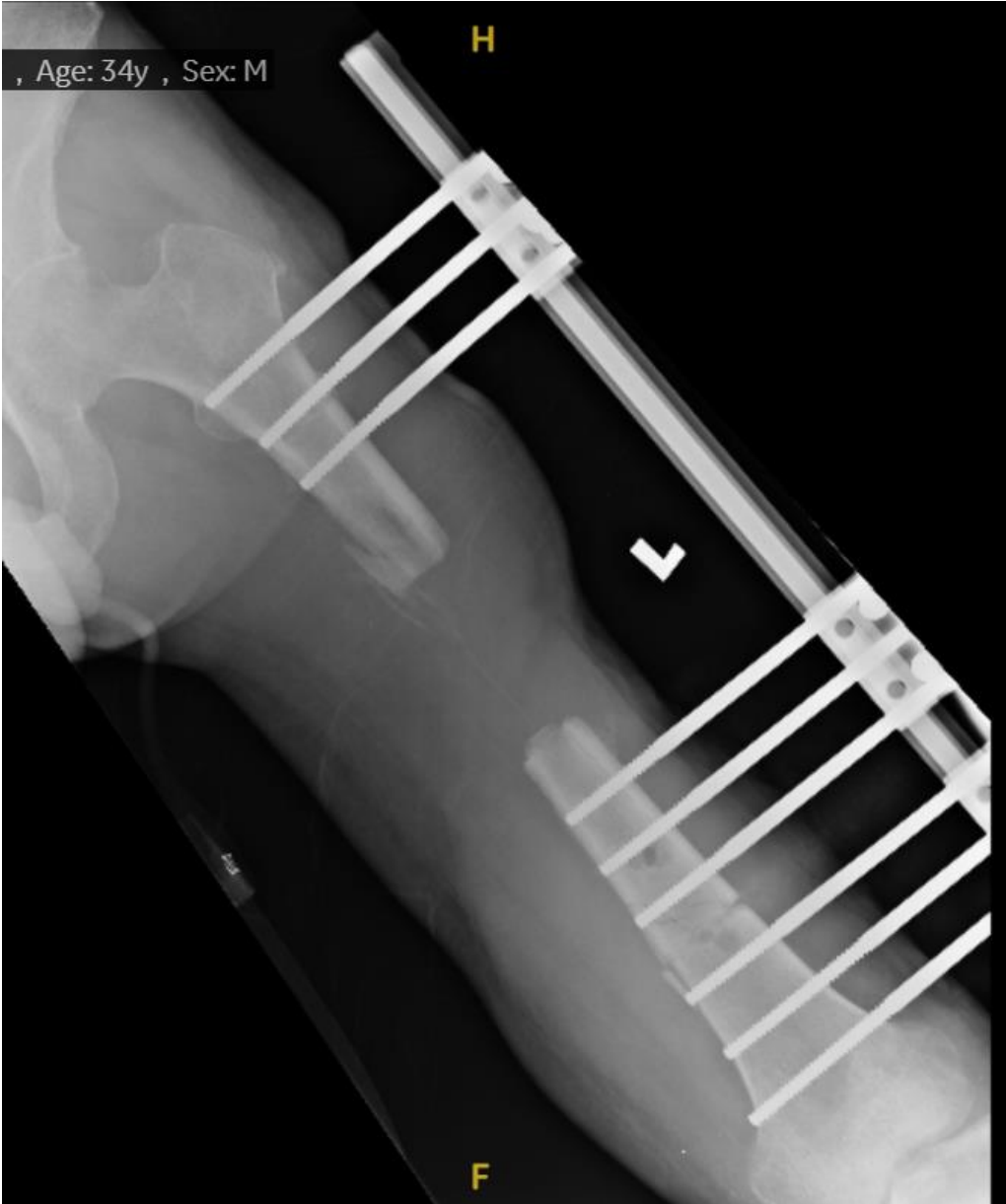
Lengthening

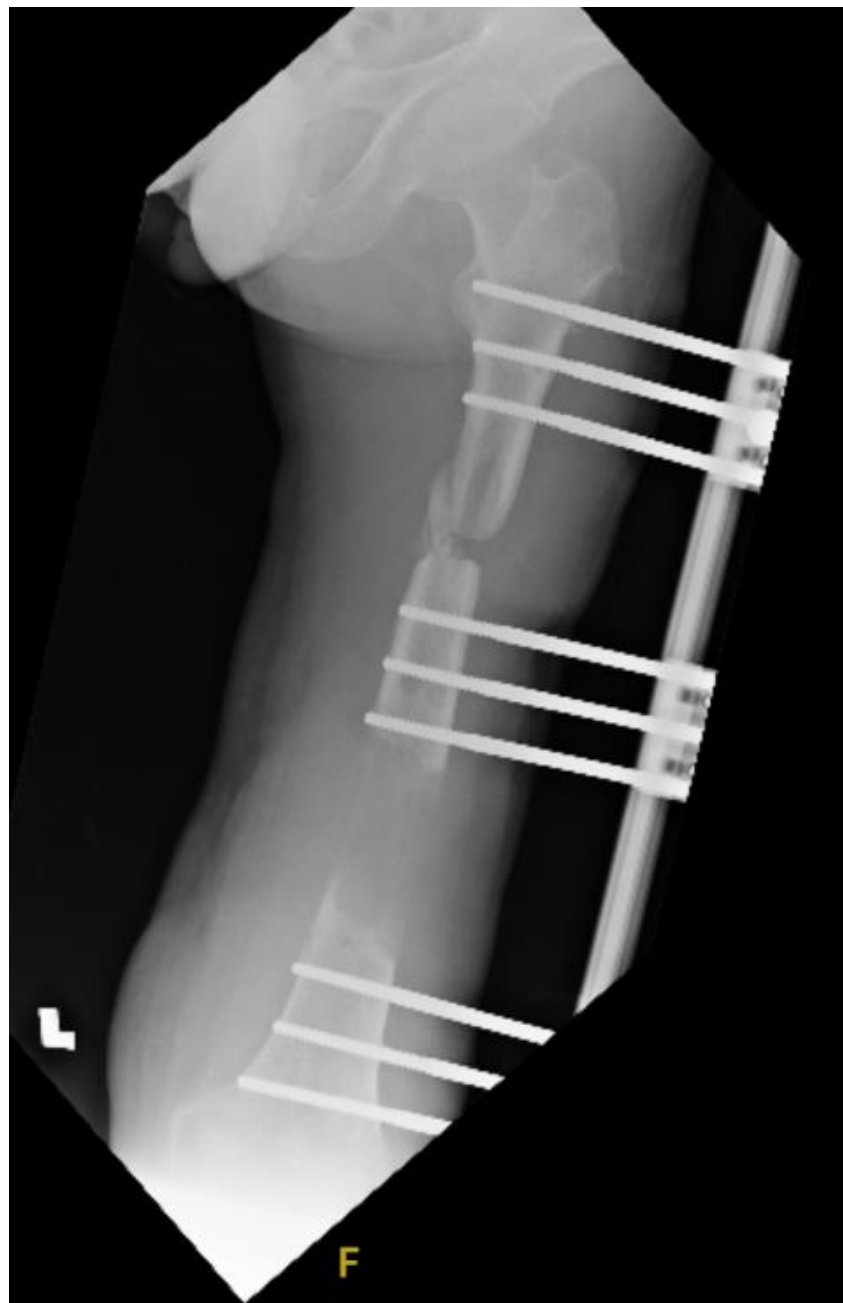


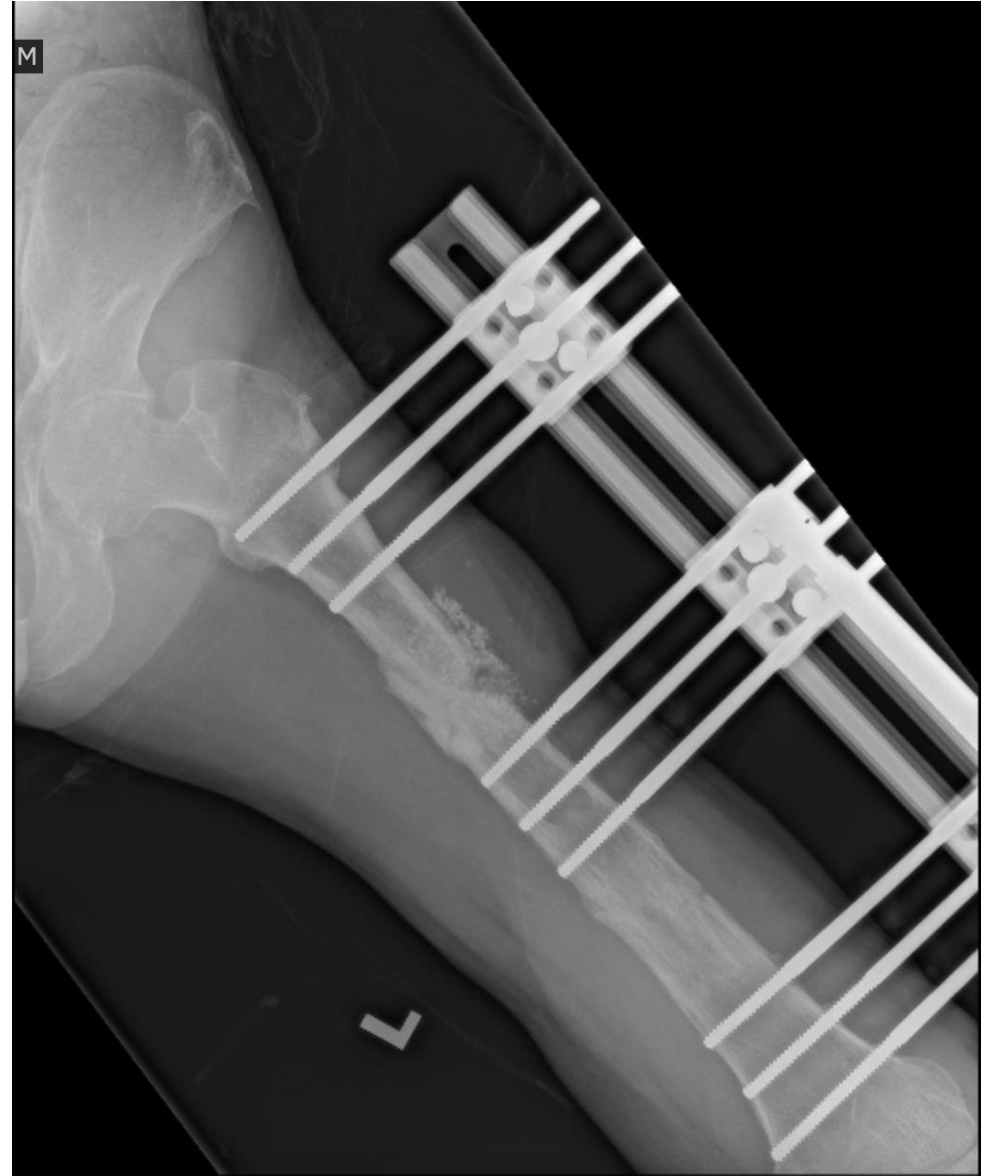
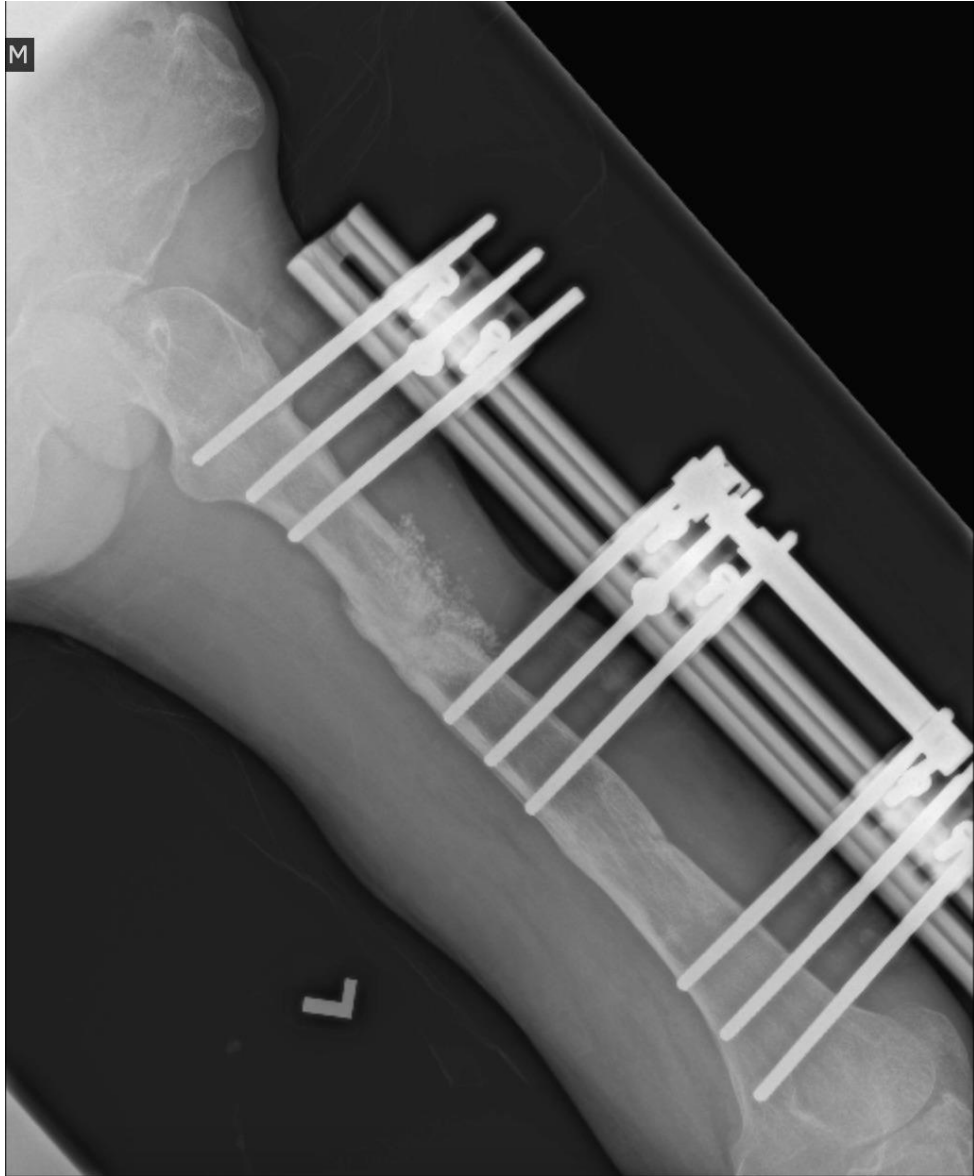
Bone Transport





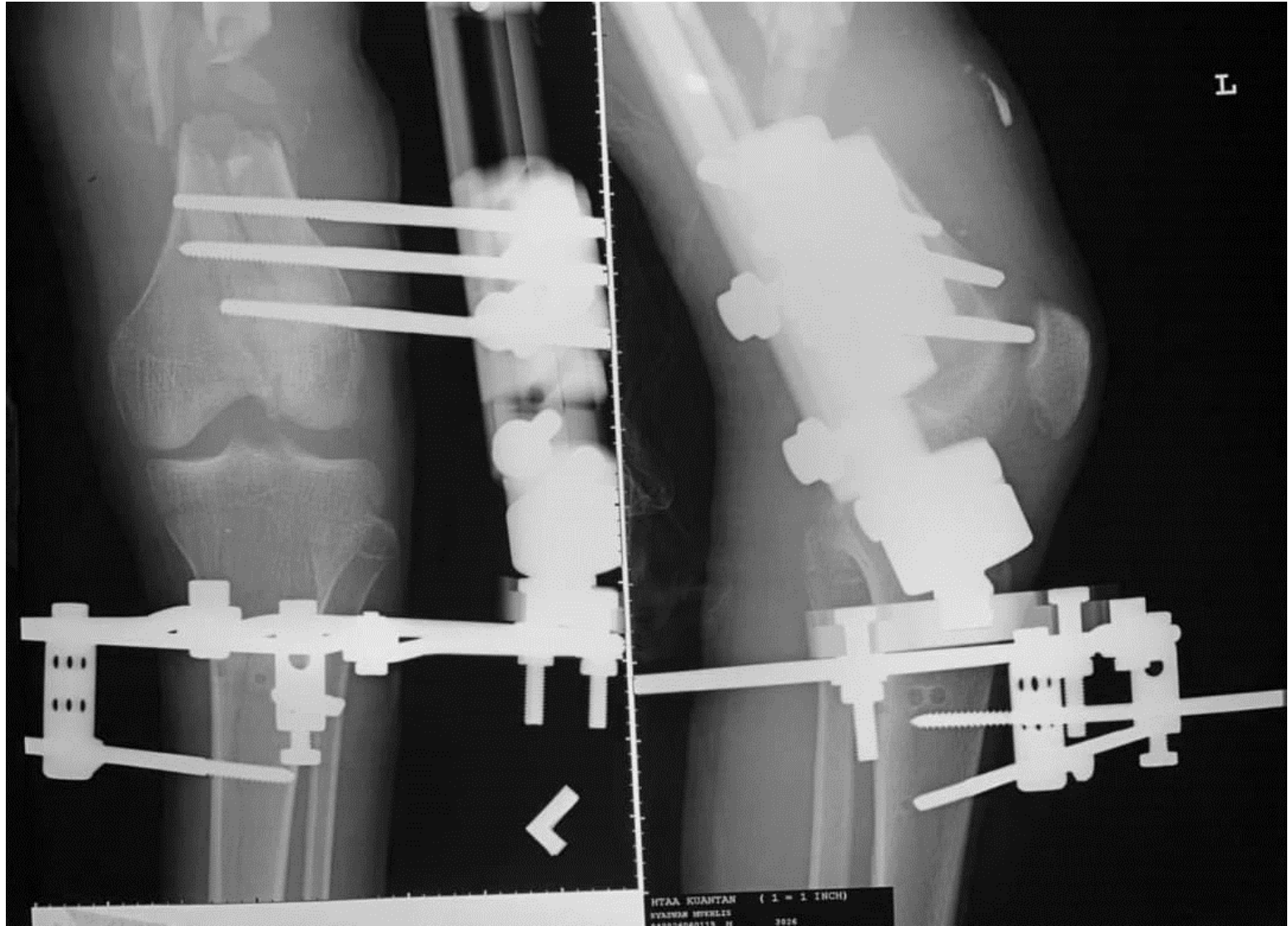
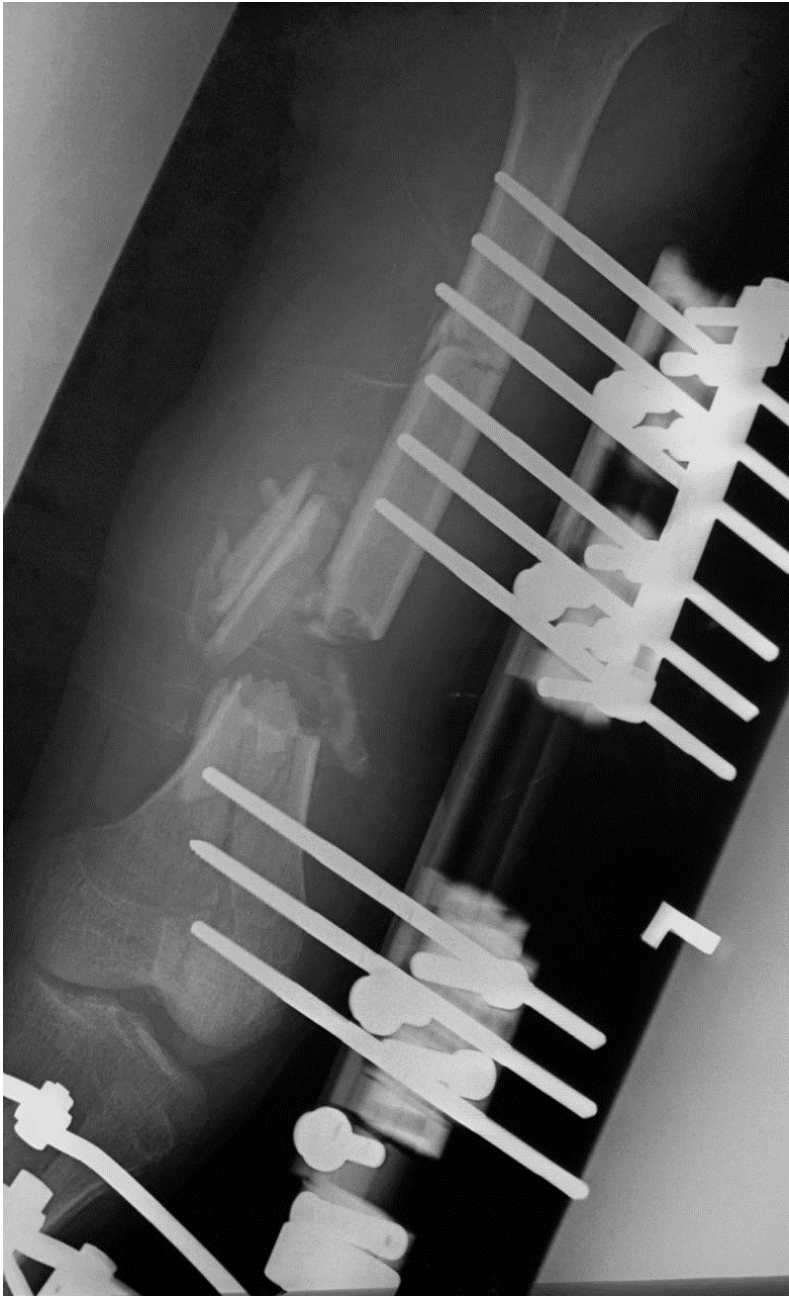






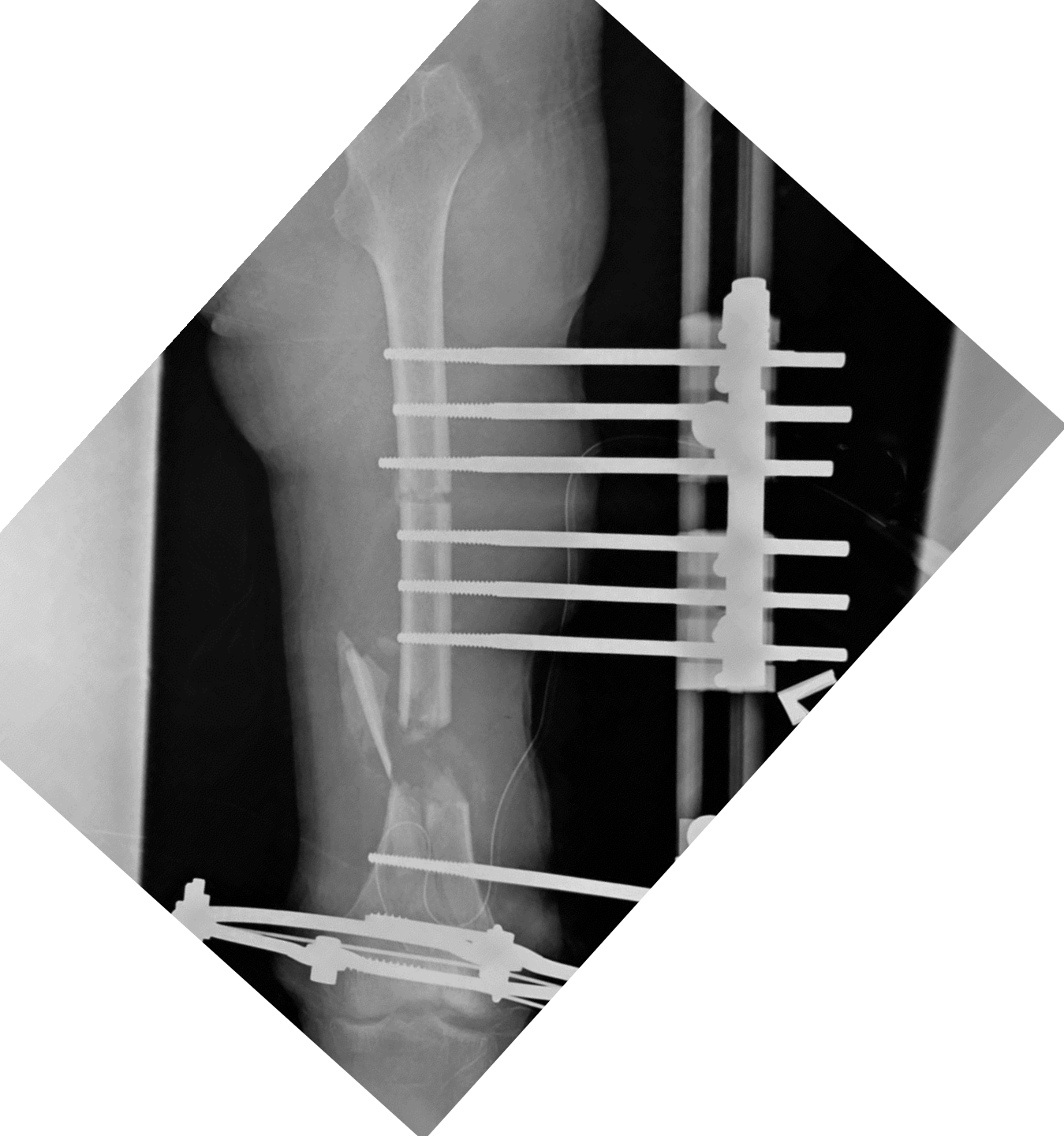
Can only be used in the shaft,
difficult for distal fracture











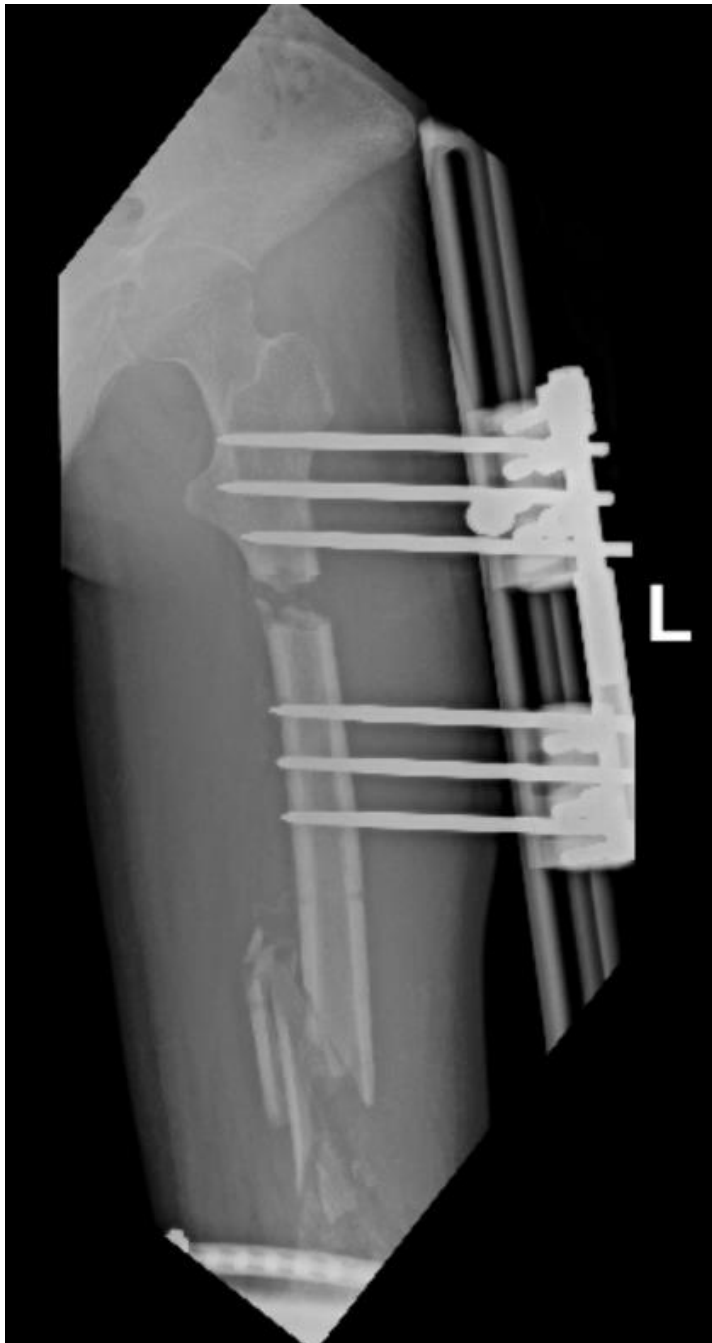
SH,, , Sex: M

Case 2



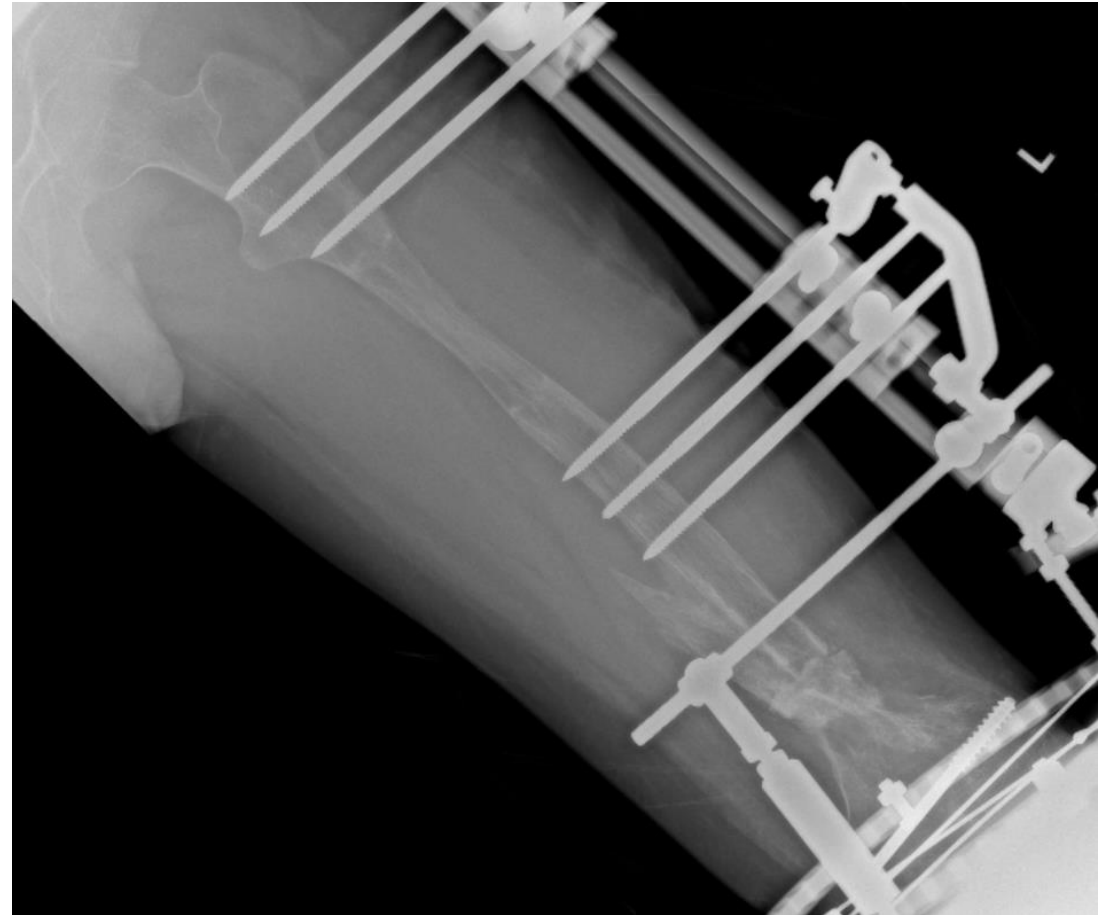
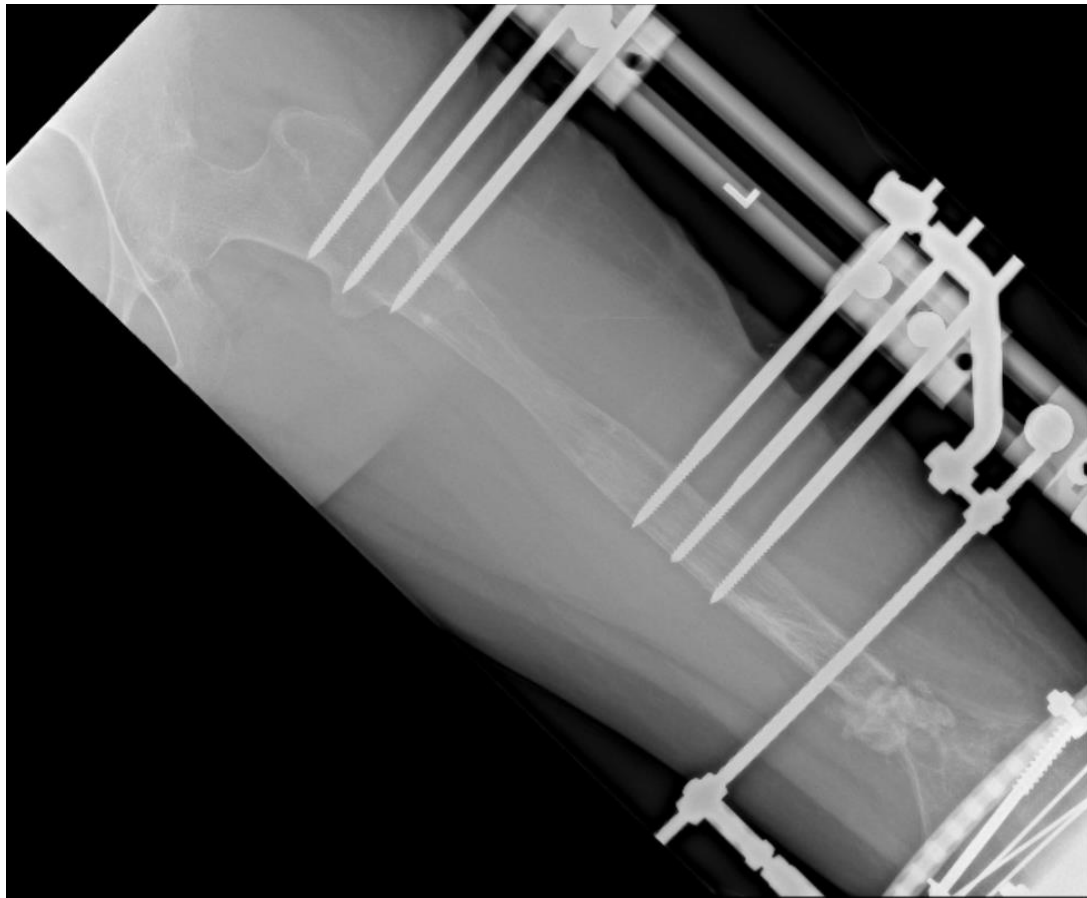
SH,, , Sex: M





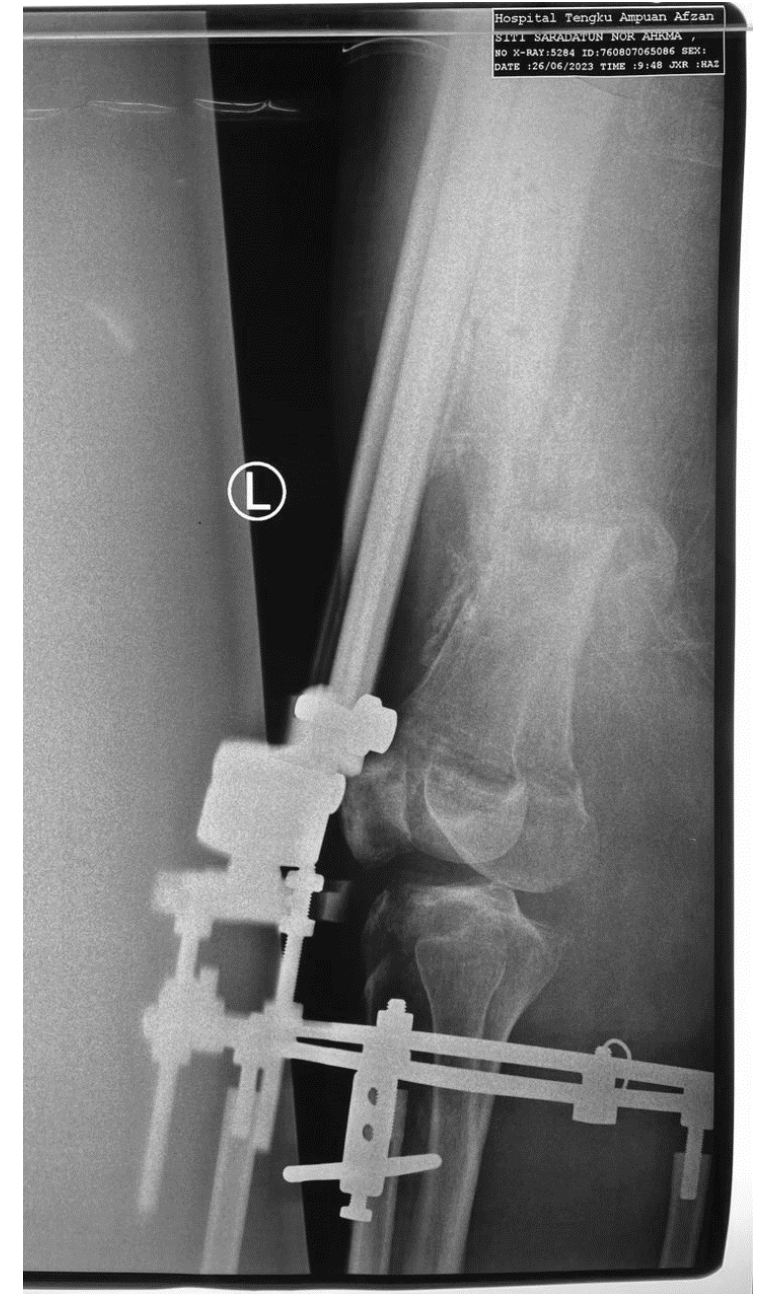








Spanning hybrid frame

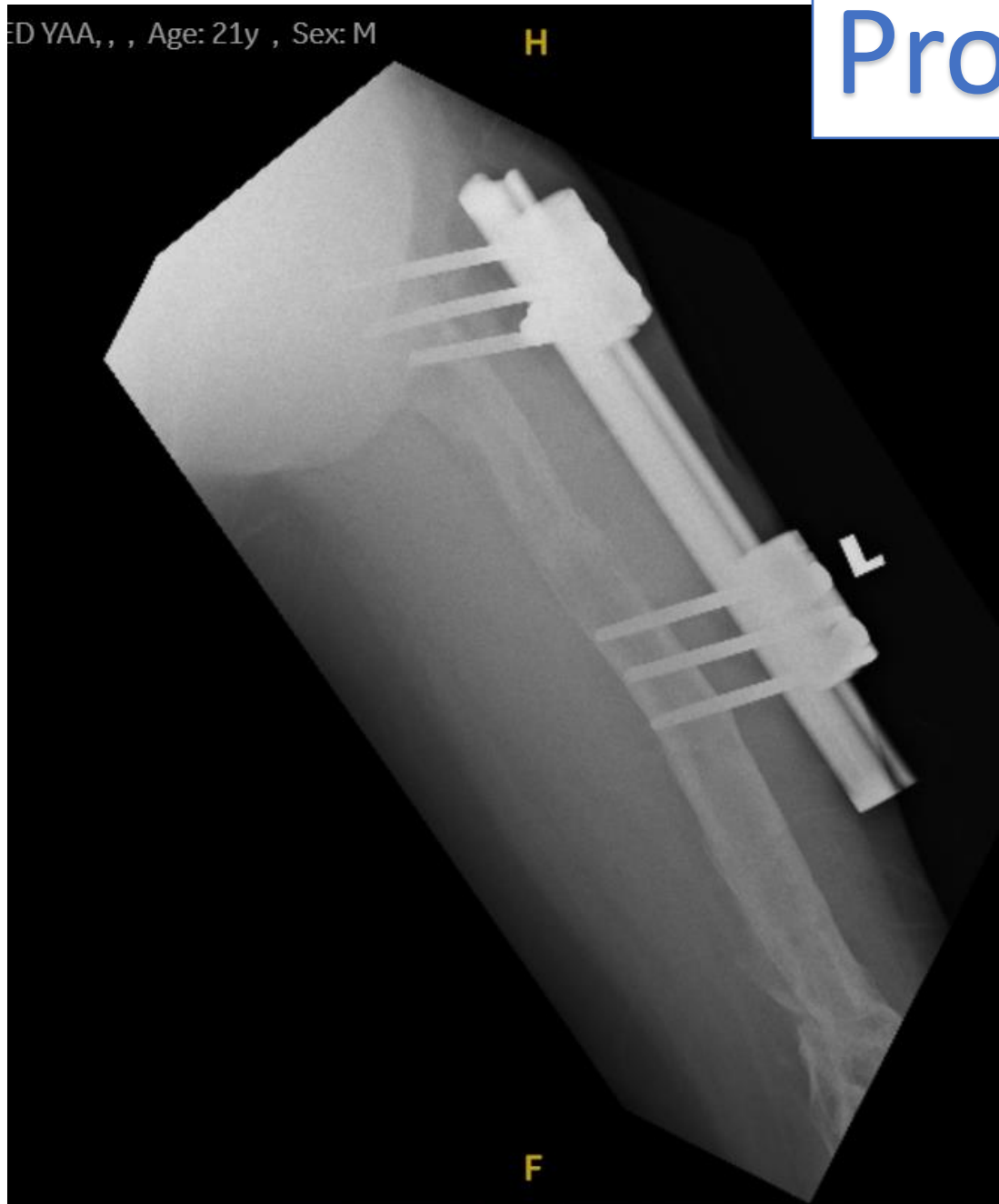


Problems

ED YAA, , Age: 21y , Sex: M

H

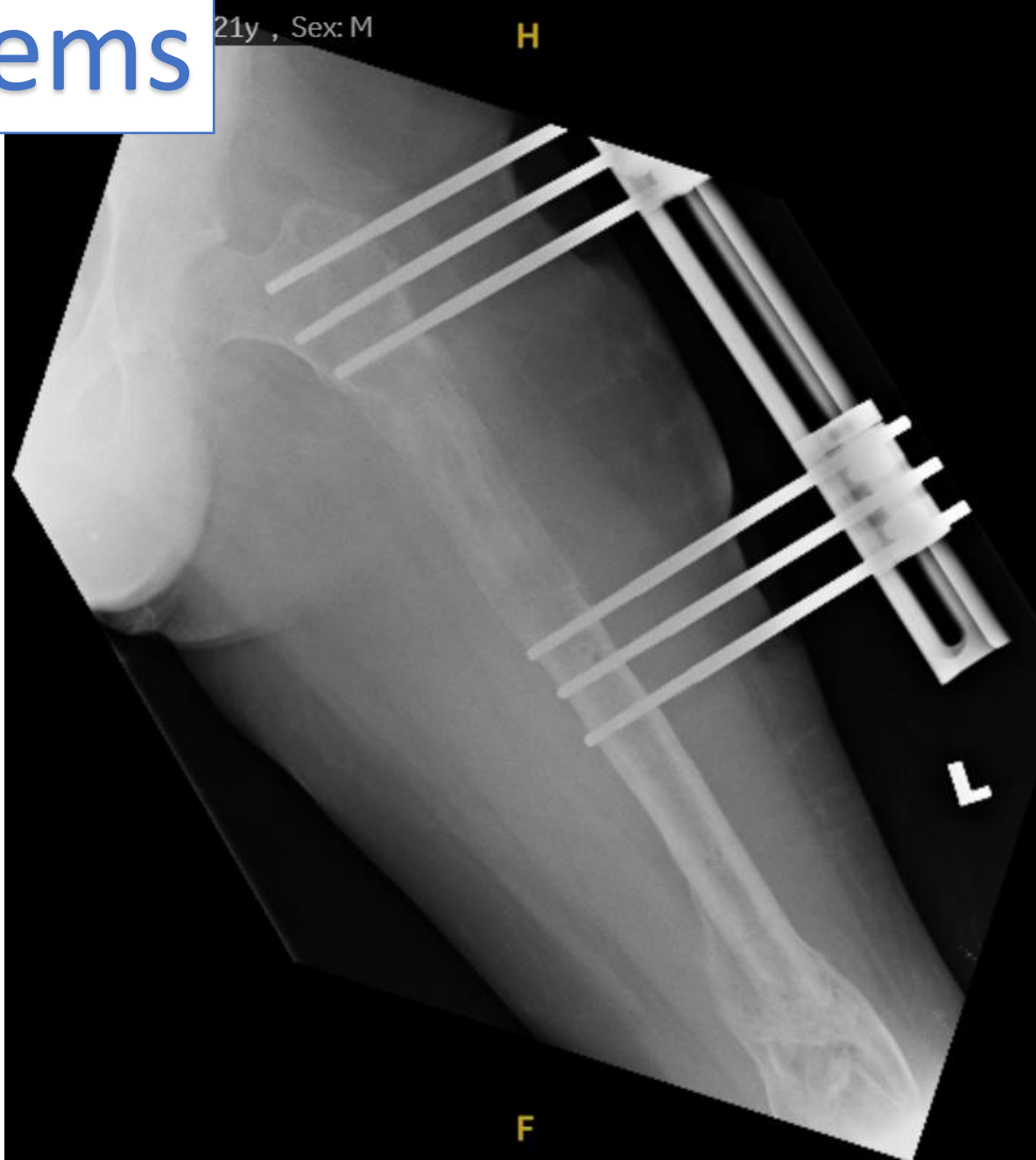
F



21y , Sex: M

H

F

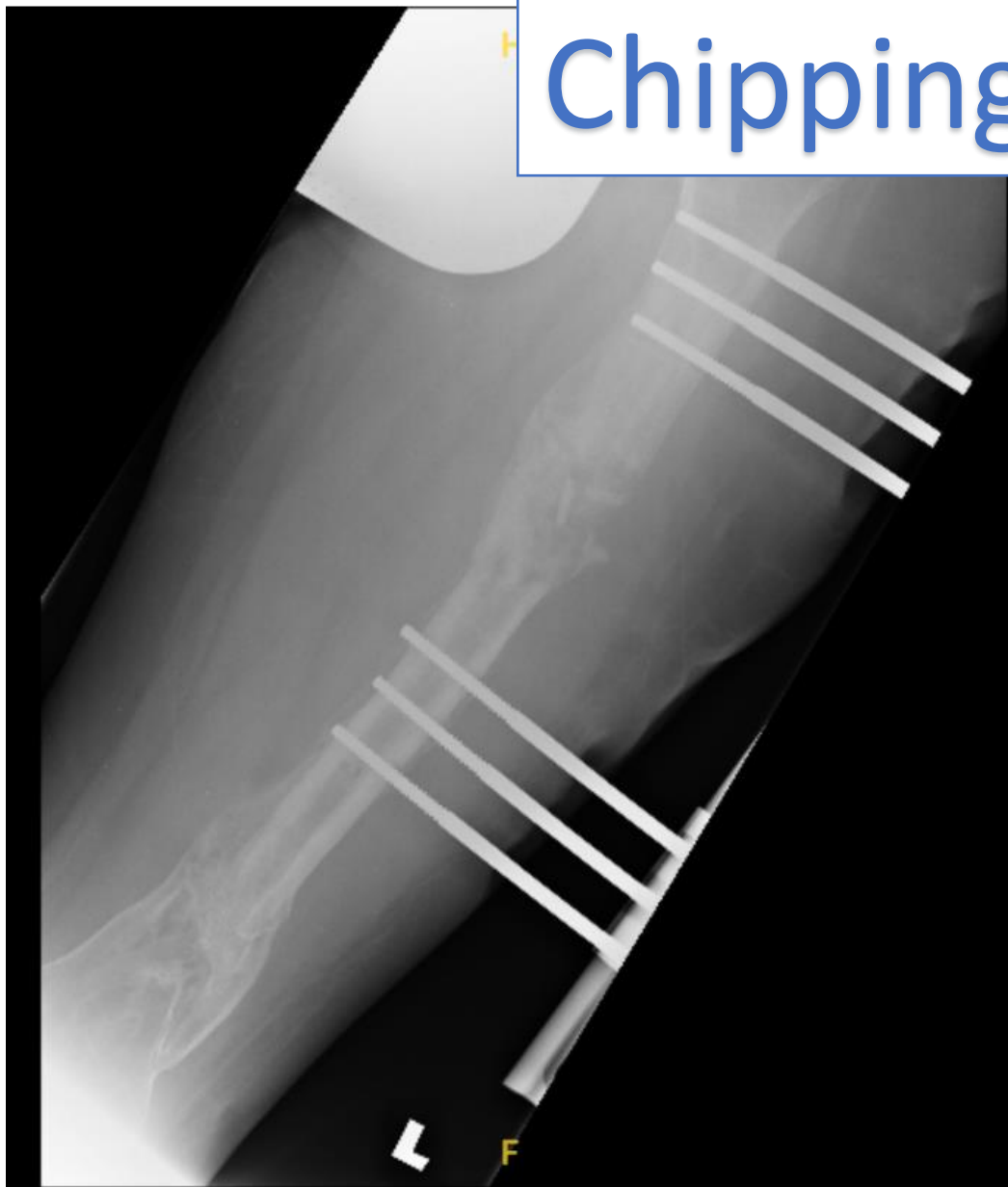


MED YAA,, , Age: 21y , Sex: M

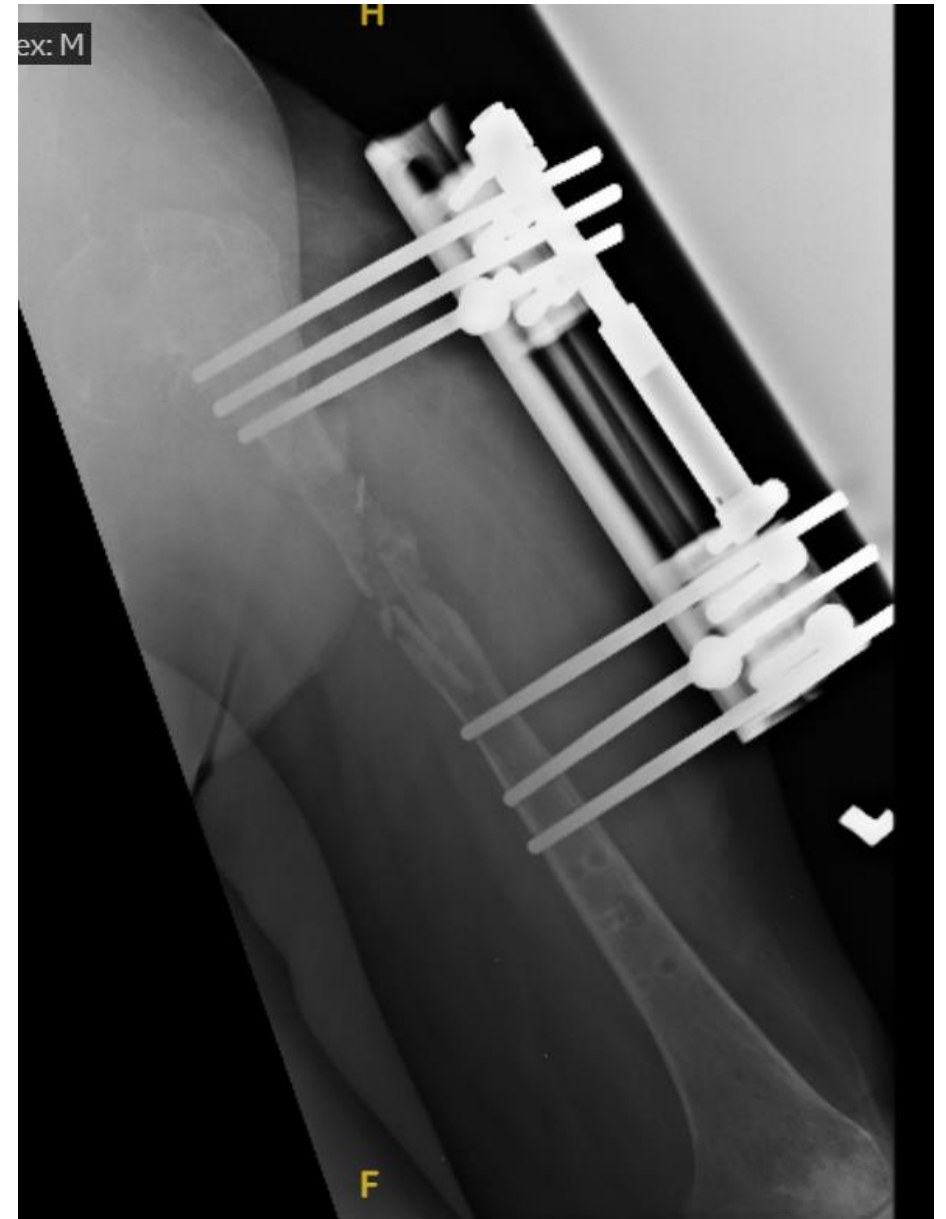
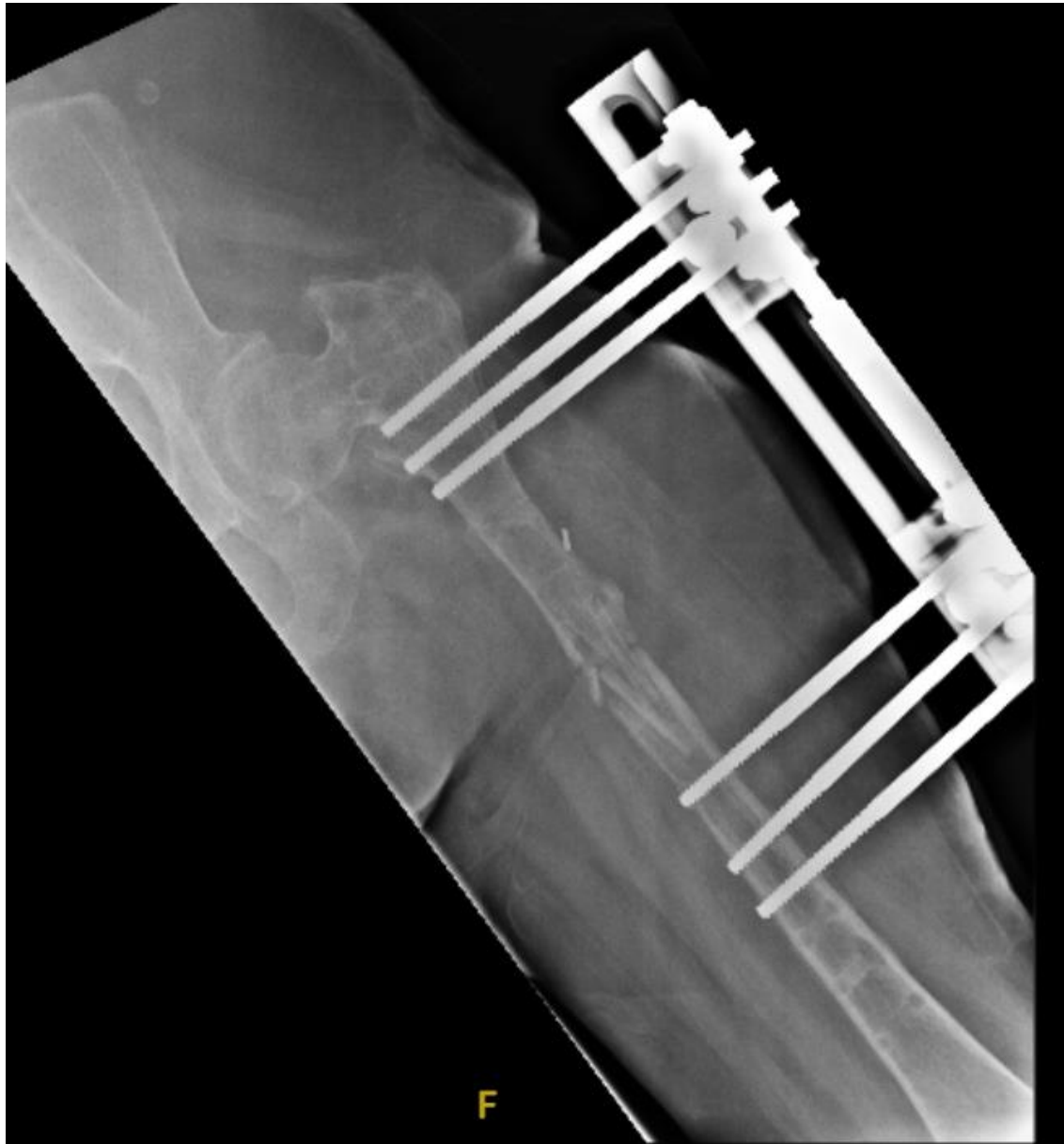


Fracture at regenerate

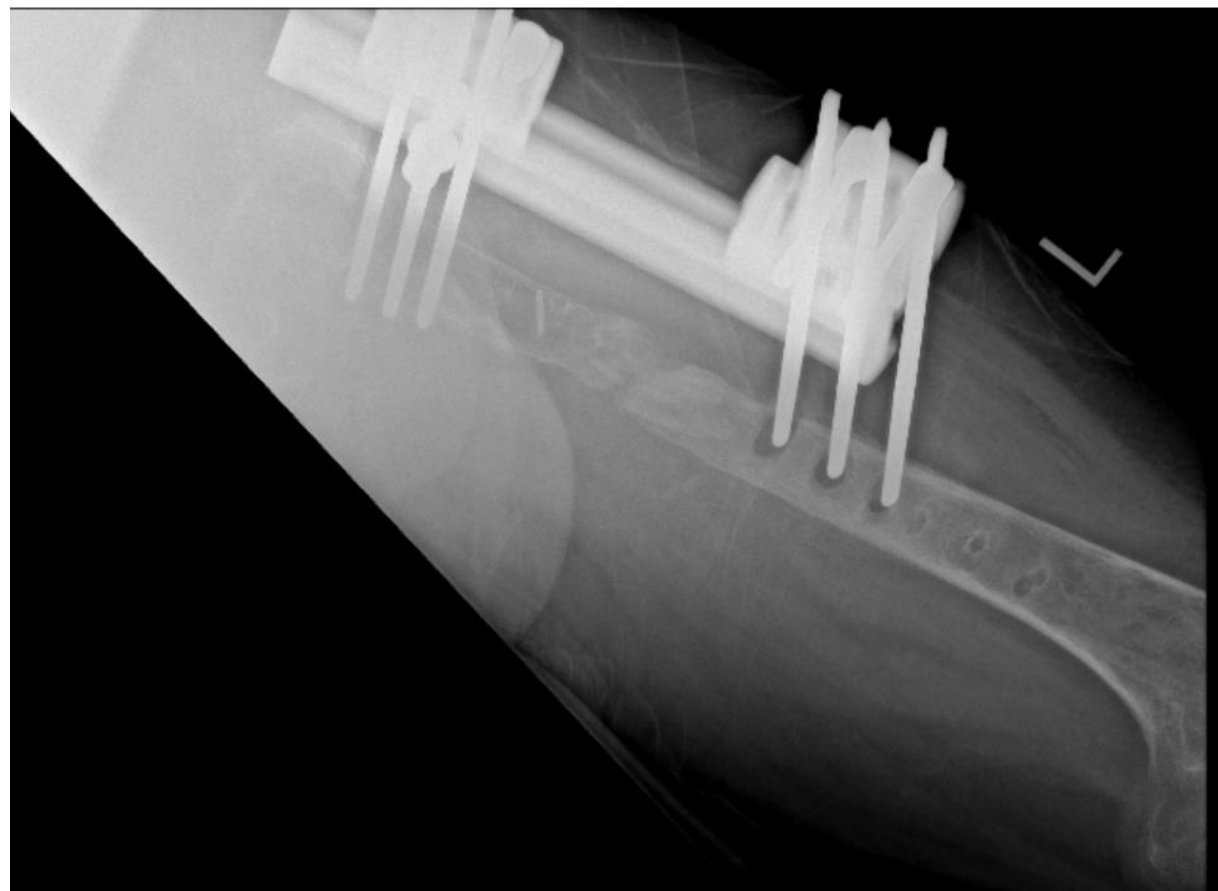
Chipping osteotomy







Loosening





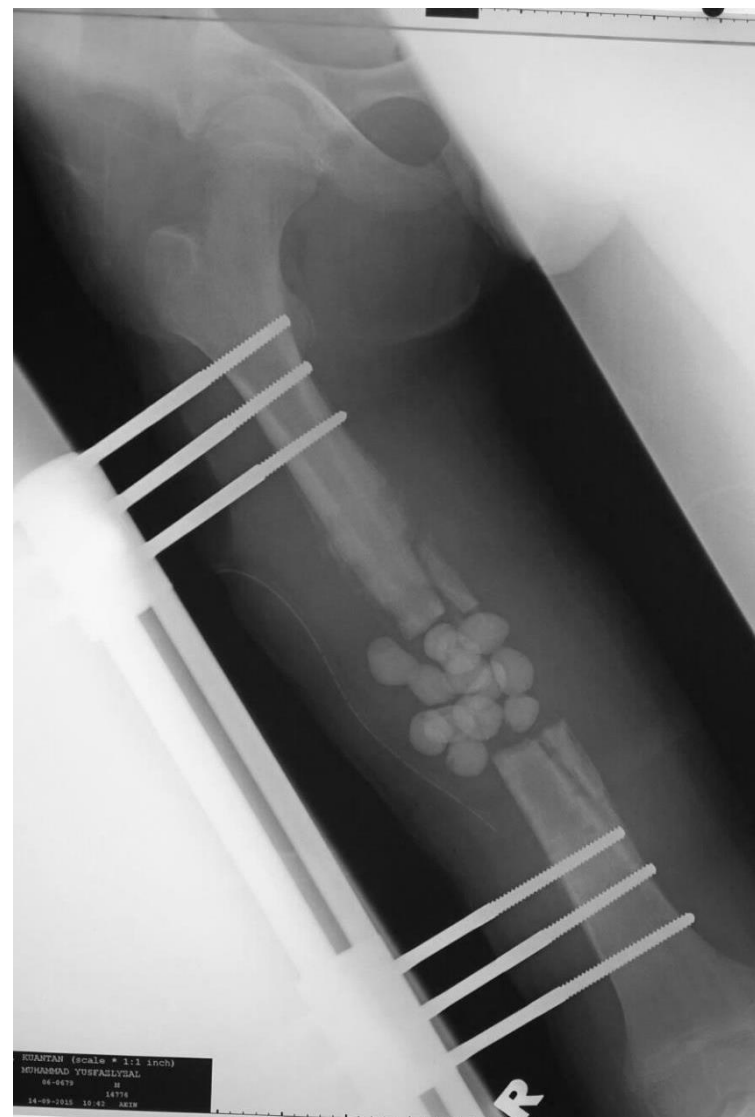


Problems

14 years old boy

Infection post-plating of
femur







Fracture at screw hole



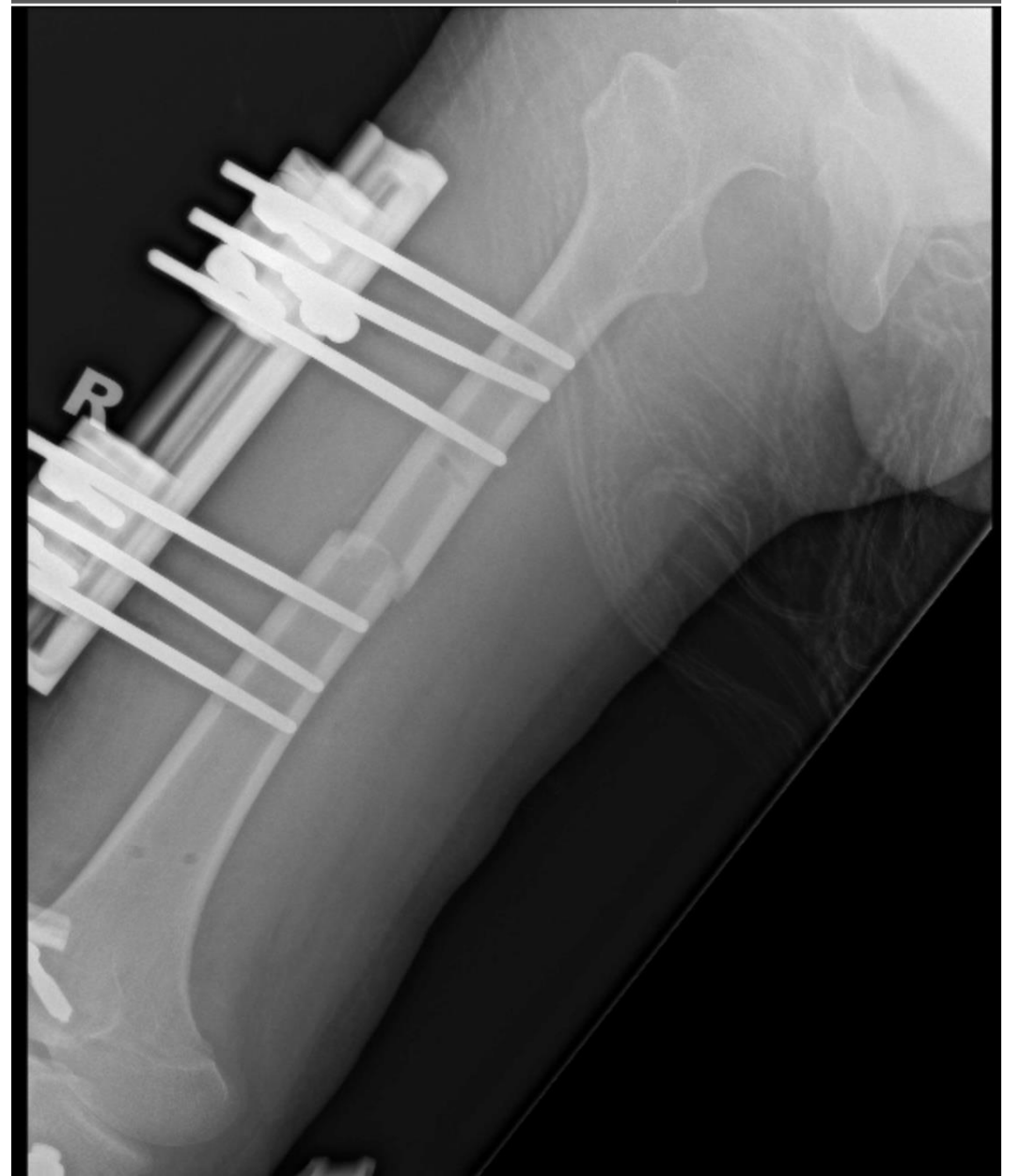
Use smaller screw





Problems







Removed after 7 months



Refracture

Nailing after the pin site heals



Important to ask
the patient
to walk before
the removal



Take home message

- Stable and comfortable to the patient
- Suitable for diaphyseal fracture, deformity correction and bone transport
- Hybrid construct for metaphyseal or cross-knee fixation
- Hydroxyapatite screw is recommended to prevent loosening
- Beware of fractures after removal of fixator