
# Arthrodesis and osteotomy of the foot: Tactics of the treatment and sequence of the surgeries in Ilizarov method

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# Complex foot deformities

***Post traumatic deformities***

***Congenital***

Idiopathic clubfoot

Arthrogrypotic clubfoot

Hemimelia

***Neurovascular deformities***

Poliomyelitis

Diabetic Charcot foot

Cerebral palsy

Charcot Marie Tooth hereditary neuropathy

Spina bifida

***Compartment syndrome***

***Burn contracture***

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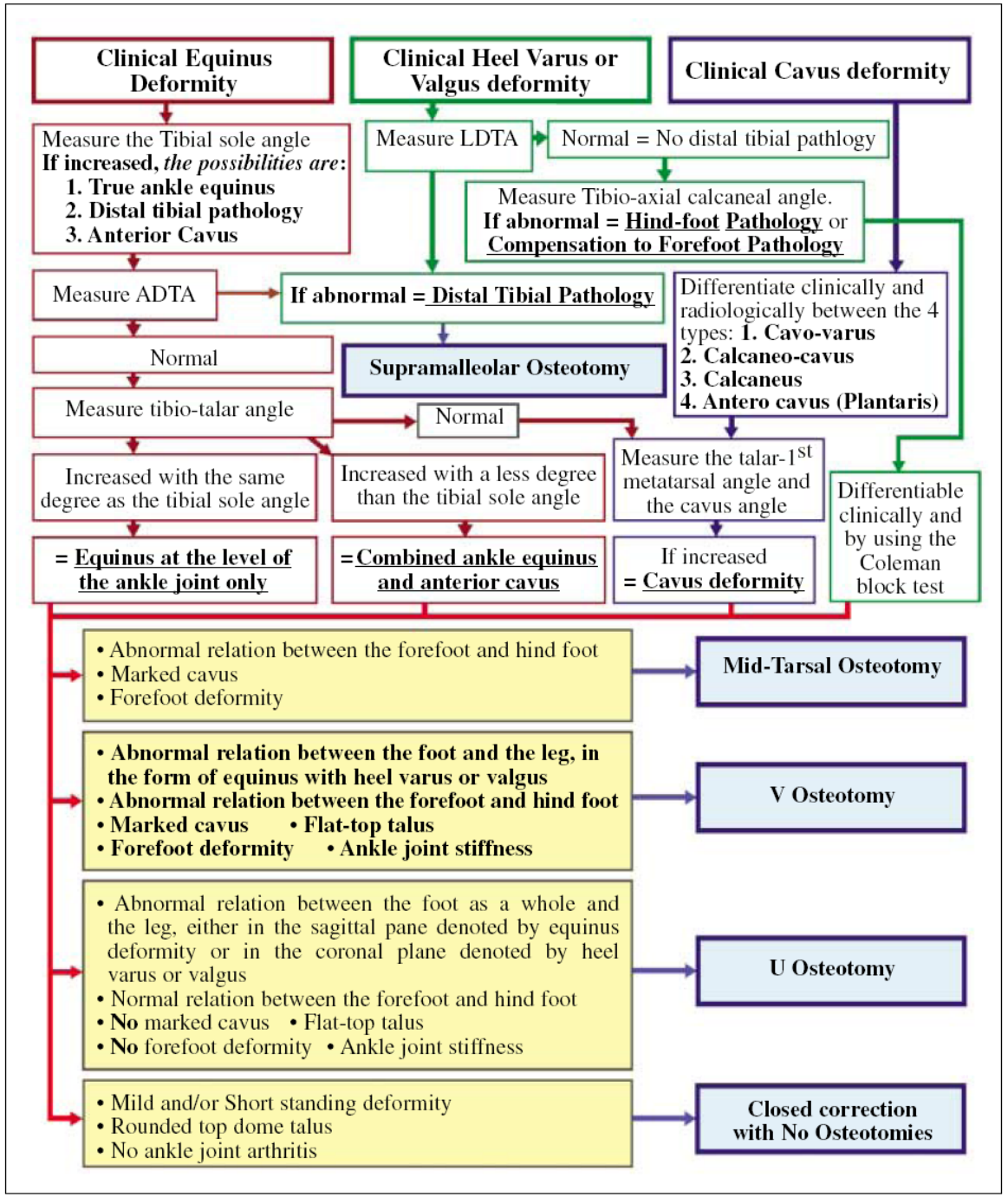


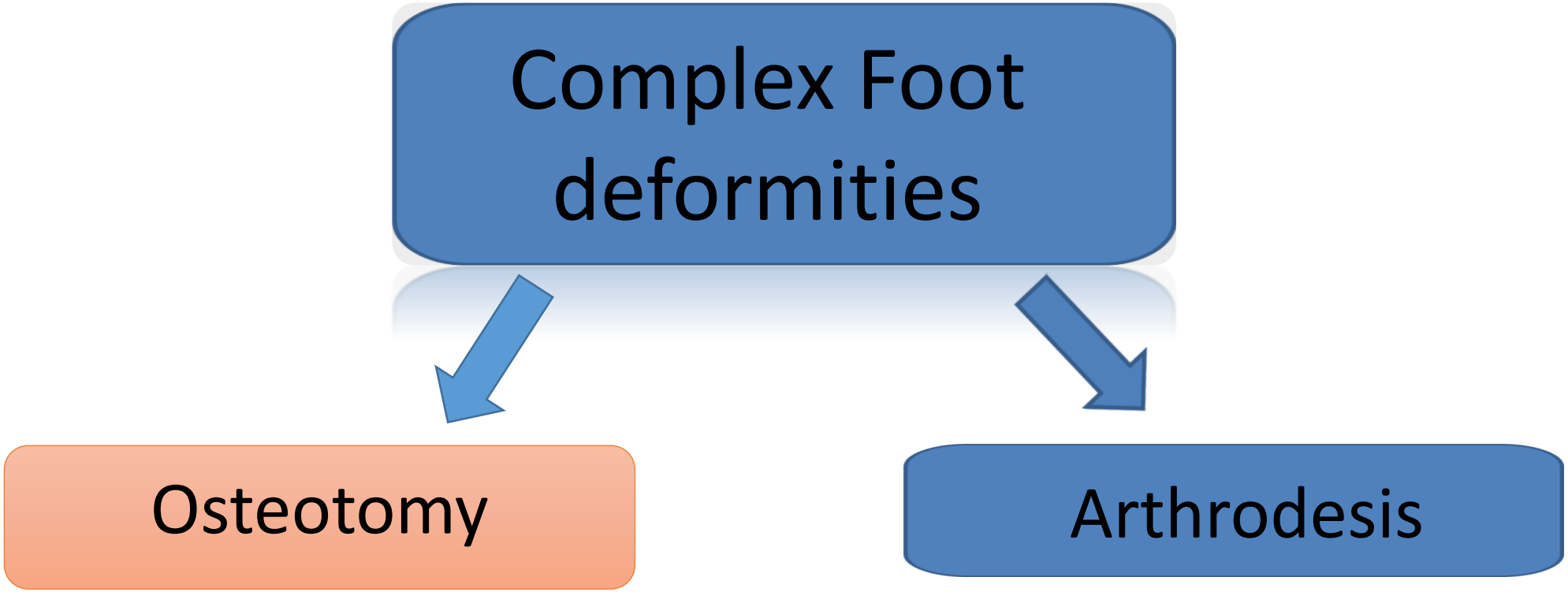

Attempt to create the algorithm of treatment of the foot deformity.

**Fig. 6** Algorithm of decision making based on clinical and radiological assessment

## Decision making regarding the type of osteotomy needed

The findings from the medical history, clinical and radiological evaluation allow the surgeon to enter the treatment pathway as described in Figure 6. This algorithm guides the surgeon to the type of correction strategy needed as well as to the type of osteotomy. A majority of the severe long-standing deformities will fit the criteria for a V-osteotomy.

- The aetiology was
- neuromuscular in 12 feet (post-poliomyelitis in 7 patients, postmeningitis in 2 patients and Charcot Marie Tooth disease in 2 patients),
- a neglected congenital deformity (CTEV) in 4 feet,
- Posttraumatic deformity (calcaneal and Lisfranc fracture dislocation) in 2 feet
- post-burn contractures in 2 feet.




RIGID FIXED DEFORMITIES

UNSTABLE OR NEUROLOGIC
( UNBALANCE STRENGTH )

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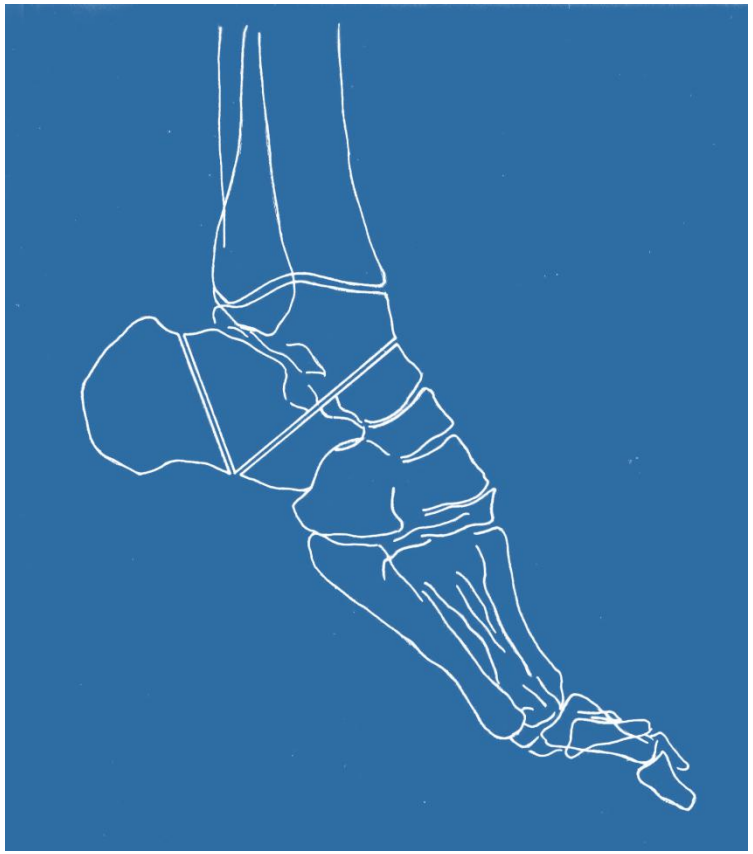
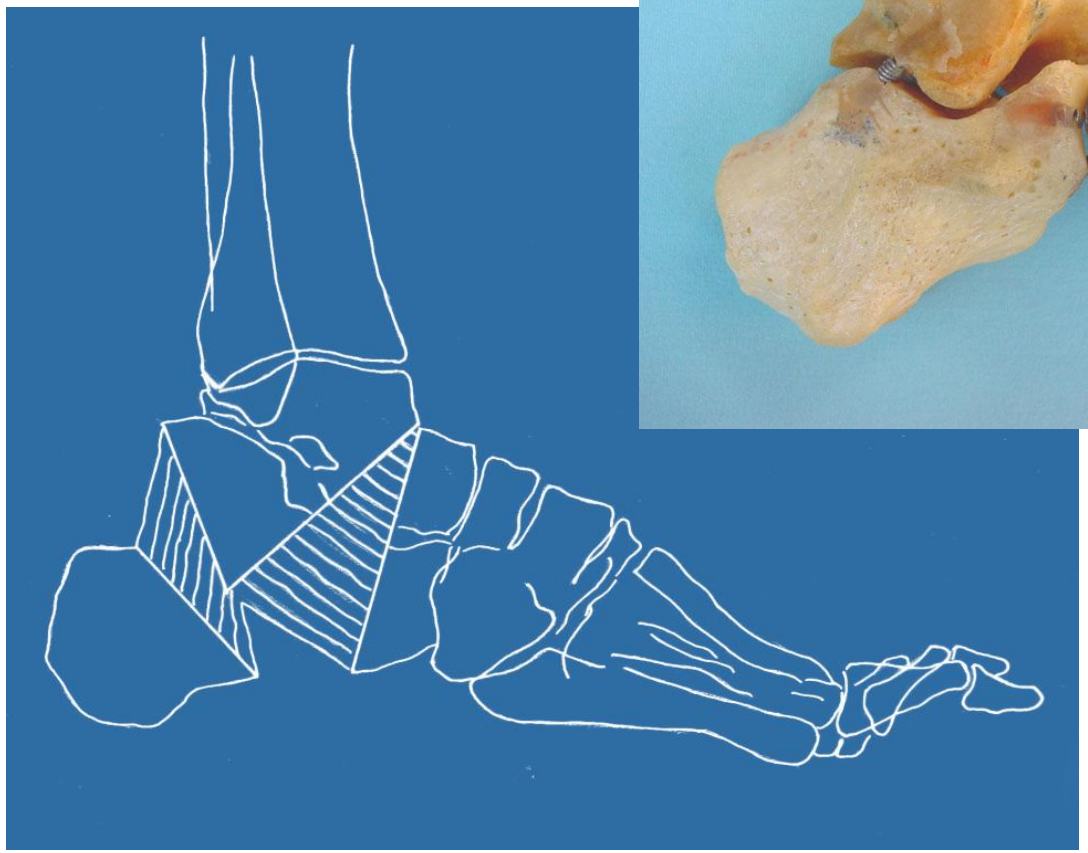
# Osteotomy indication

- POSTRAUMATIC FIXED DEFORMITY
- RIGID CONGENITAL DEFORMITY (RECCURENT CLUB FOOT IN ADULTS, AFTER 12-13 YEARS OLD)
- HEMIMELIA FOOT DEFORMITY, (EARLY AGE TOO)
- FOOT PREVIOUSLY OPERATAD WITH ARTHRODESIS (NEUROLOGIC- POLIO, SPINA BIFIDA)

"V" osteotomy

posterior calcaneus + anterior calcaneus and talus osteotomies





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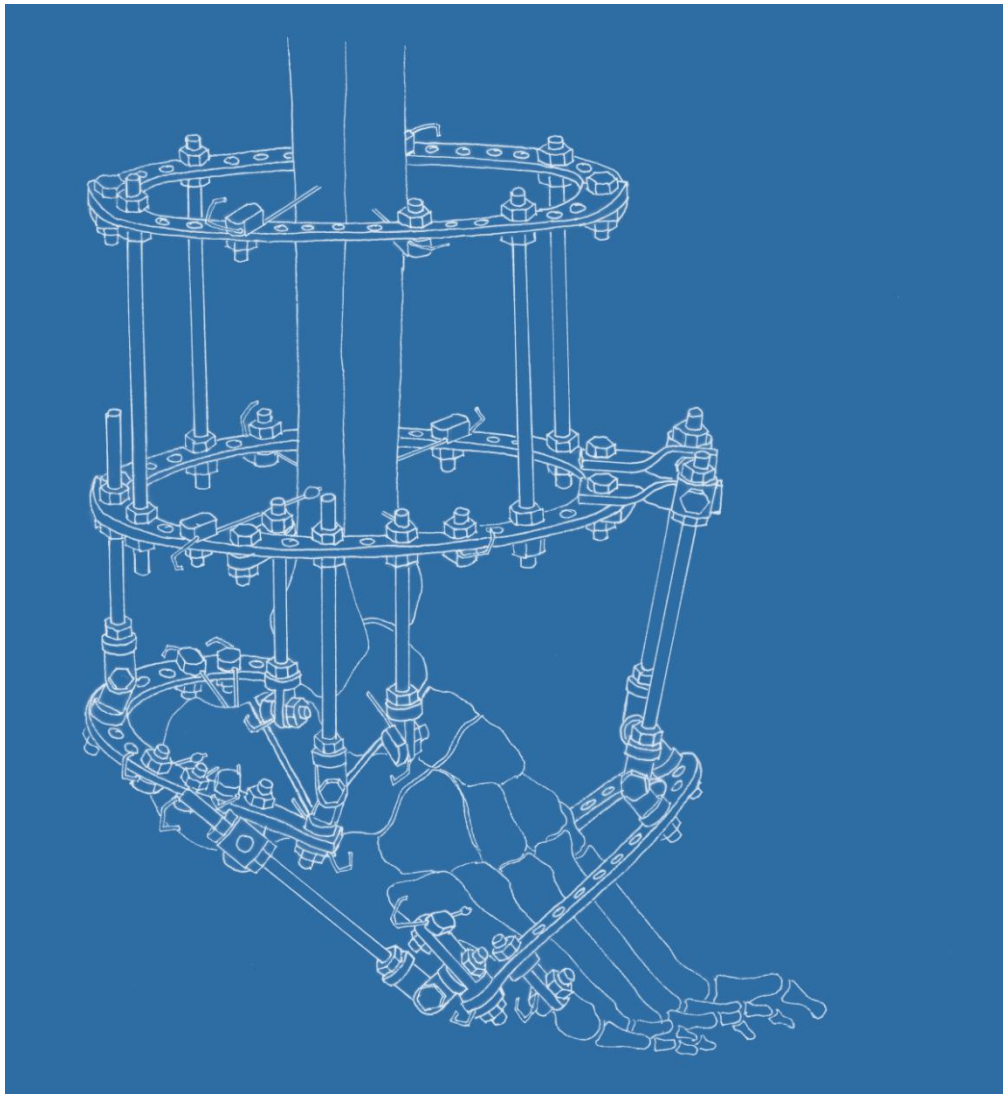

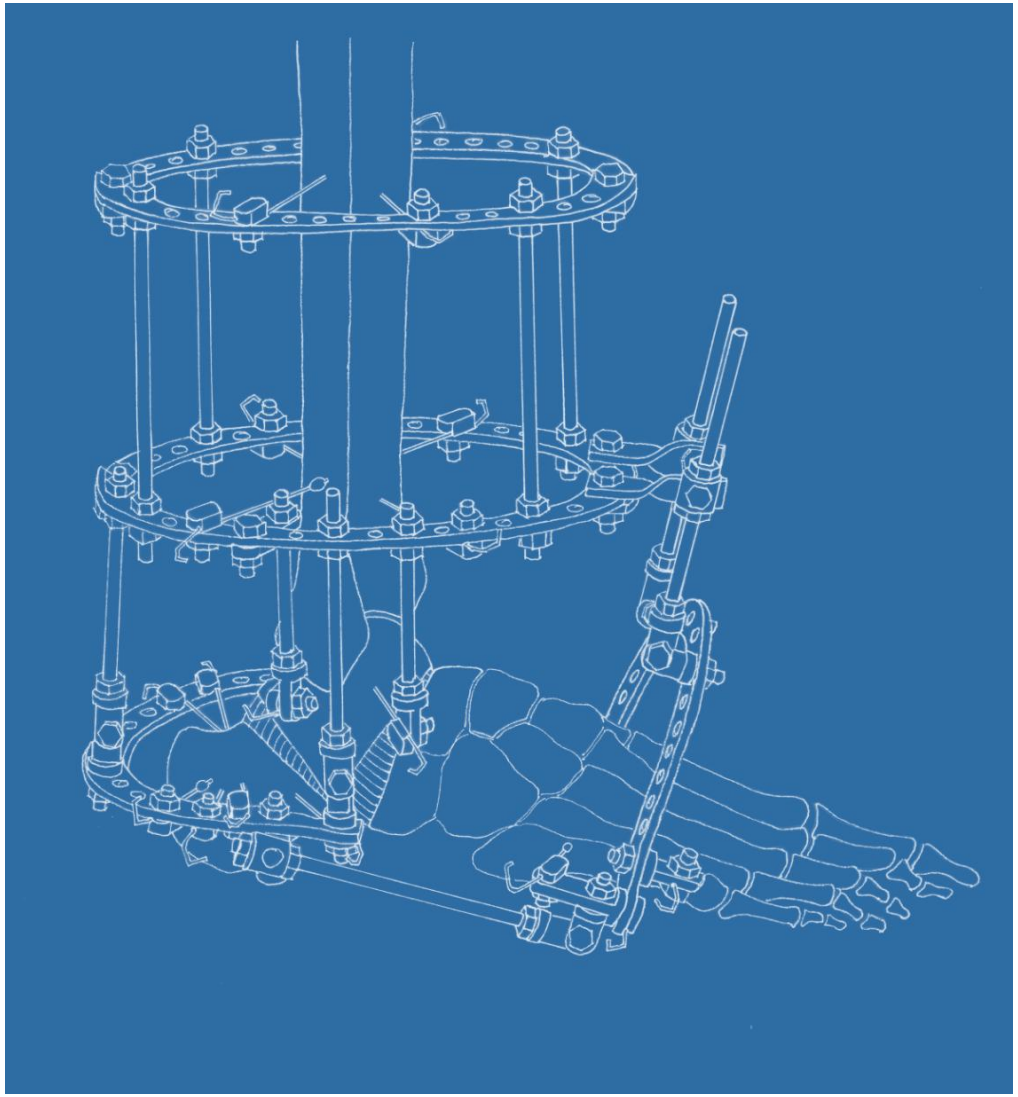

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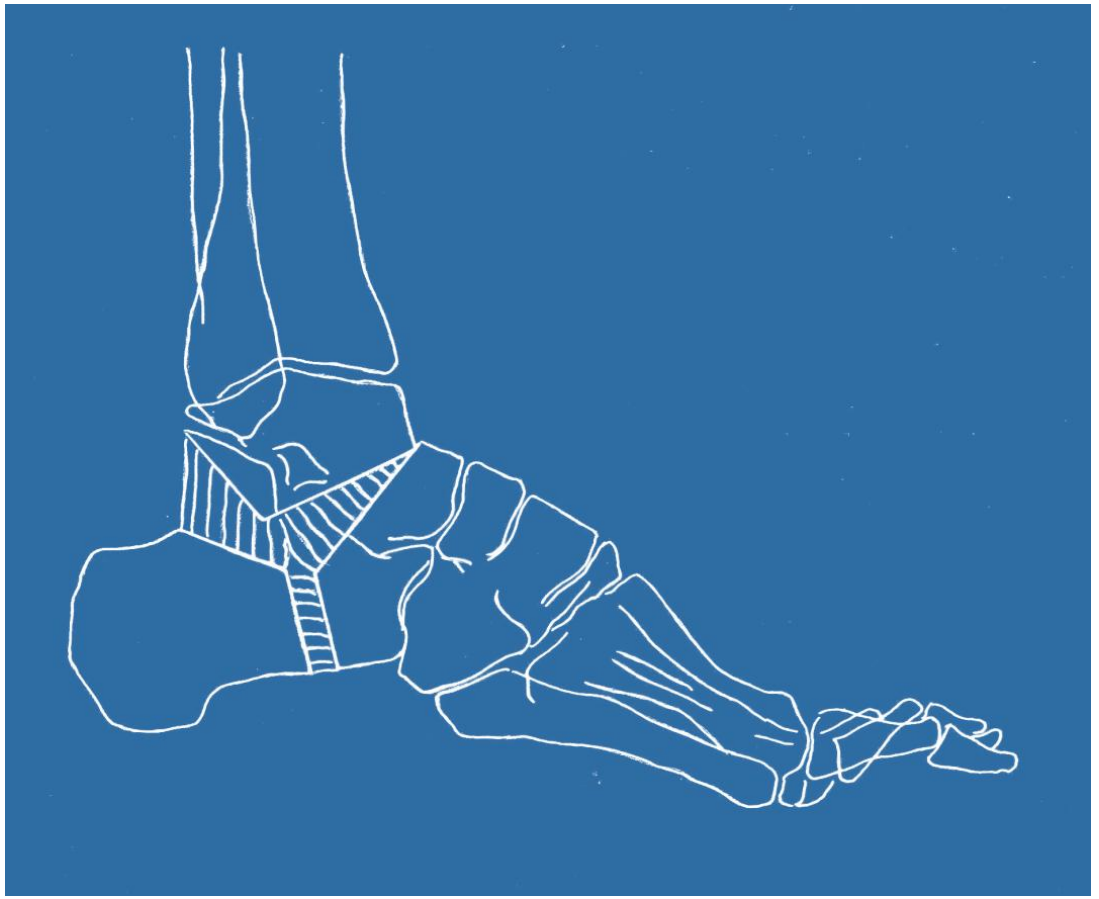
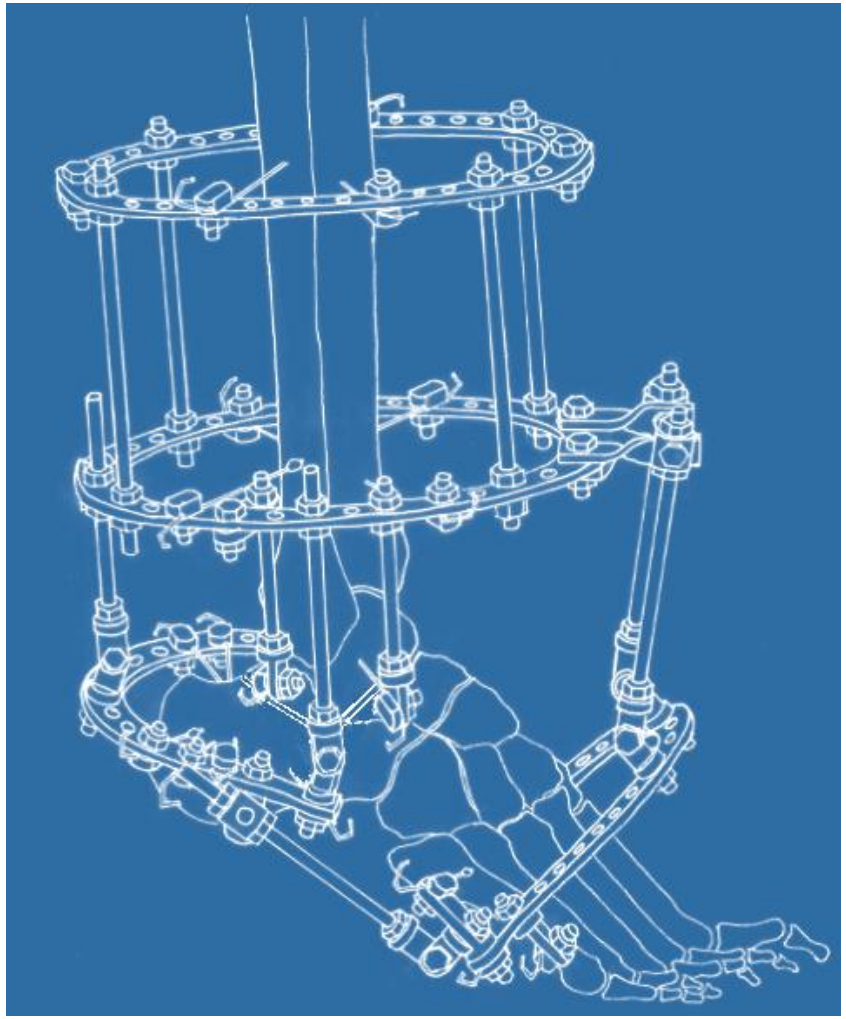
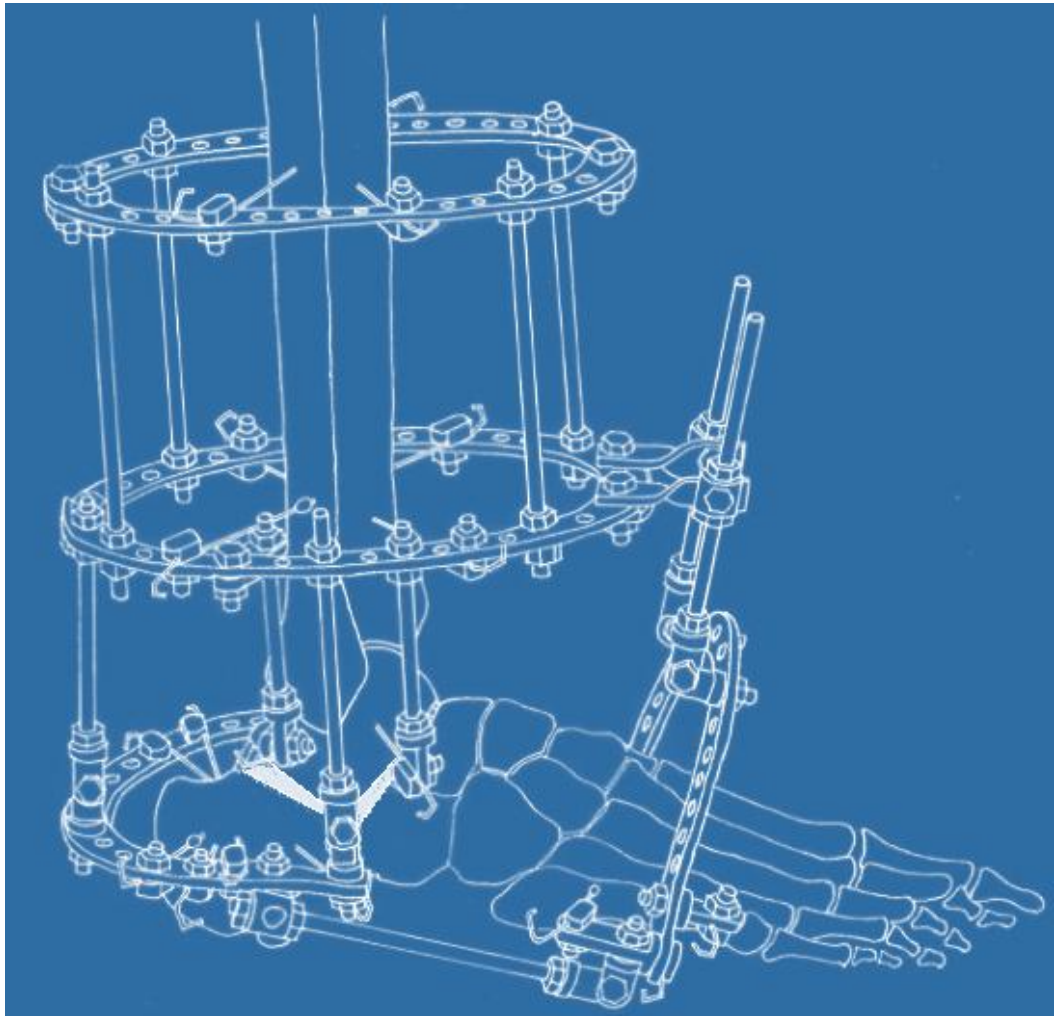
# Y-osteotomy







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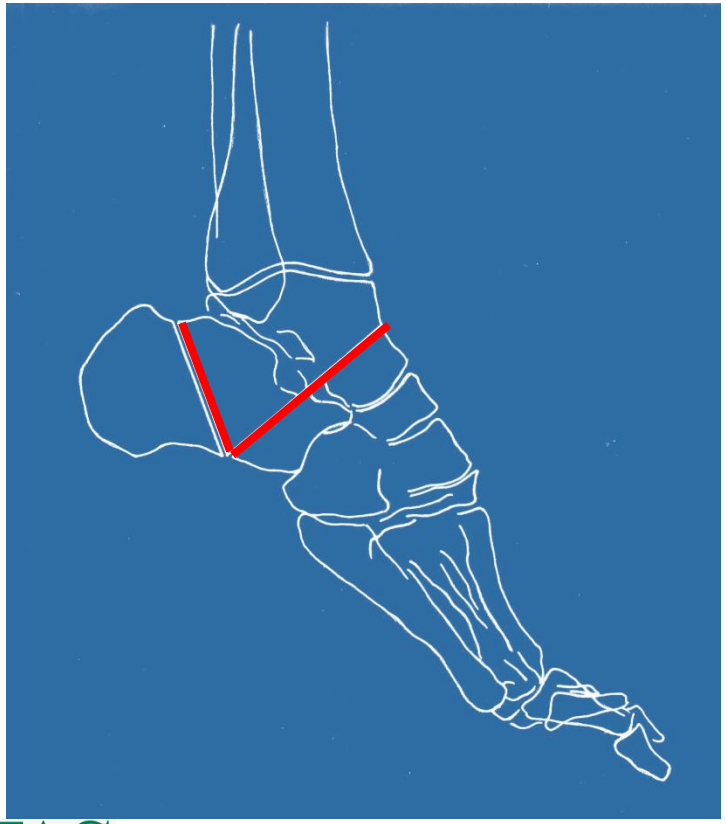
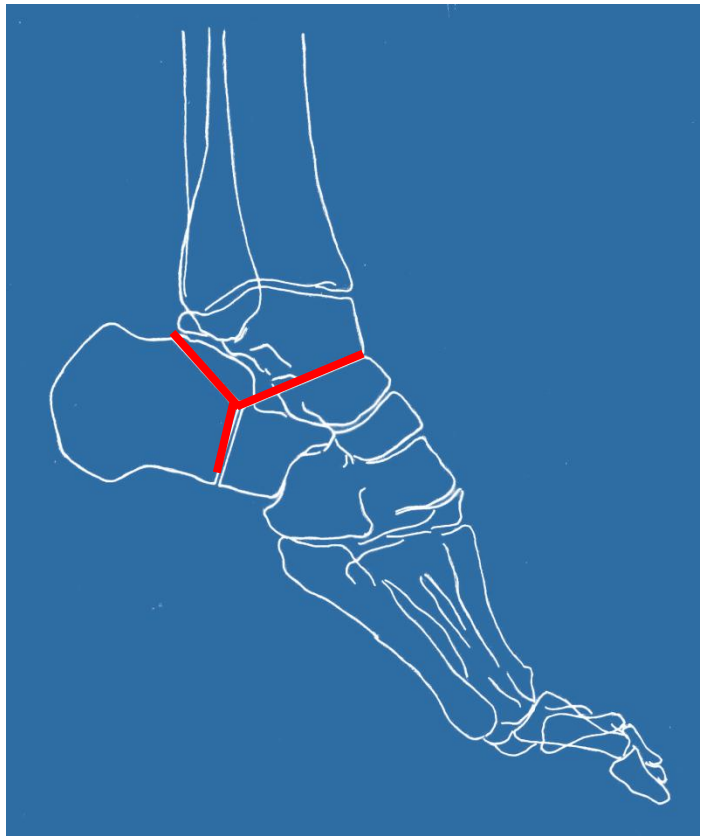
# “V” osteotomy “Y”

Similarity:

*the same possibility of simultaneous correction of the hind foot and forefoot deformities*





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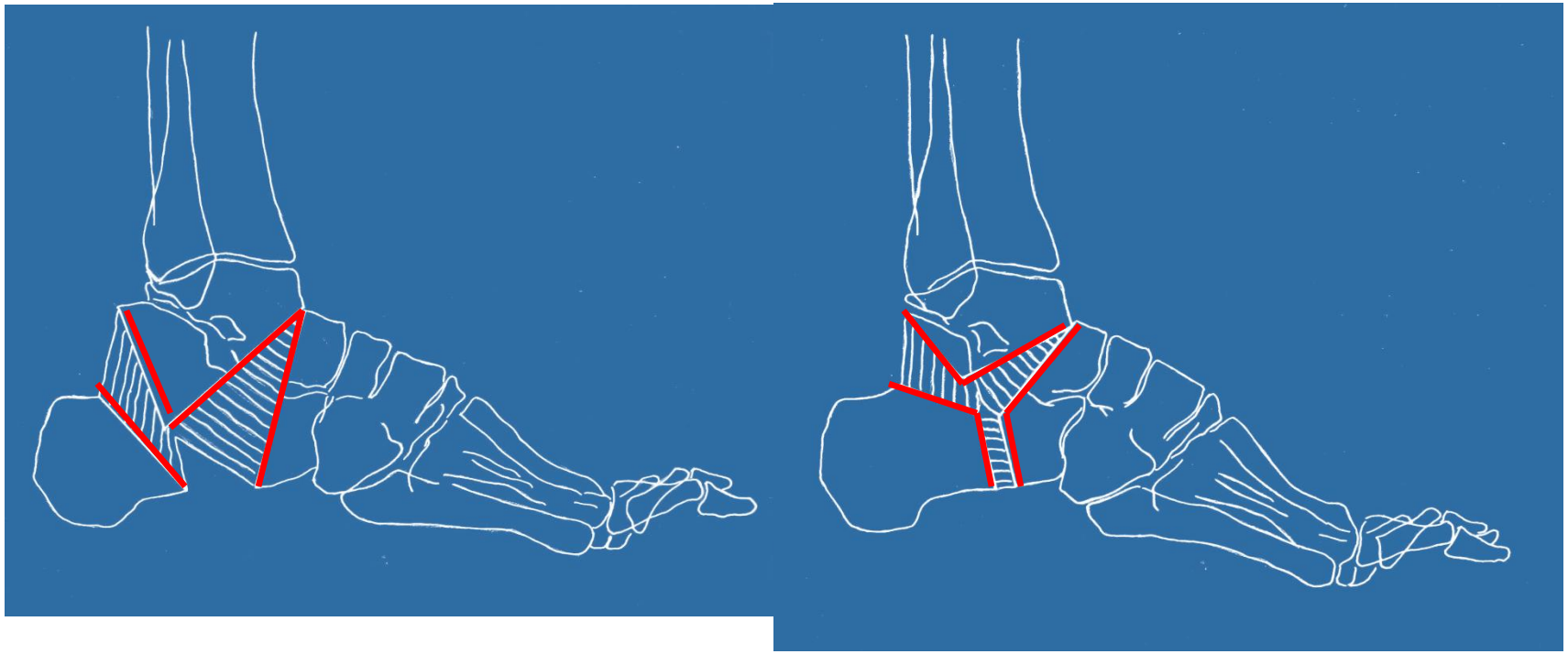
# “V” osteotomy “Y”

Advantages of Y osteotomy:

- *-less execessive lenghening of the foot*
- *-smaller bony regenerates*
- *-shorter healing time*
- *-less complications*



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15 y.o.male
reccurent club foot,
equinovarus foot

*OSTEOTOMY*
*CORRECTION*

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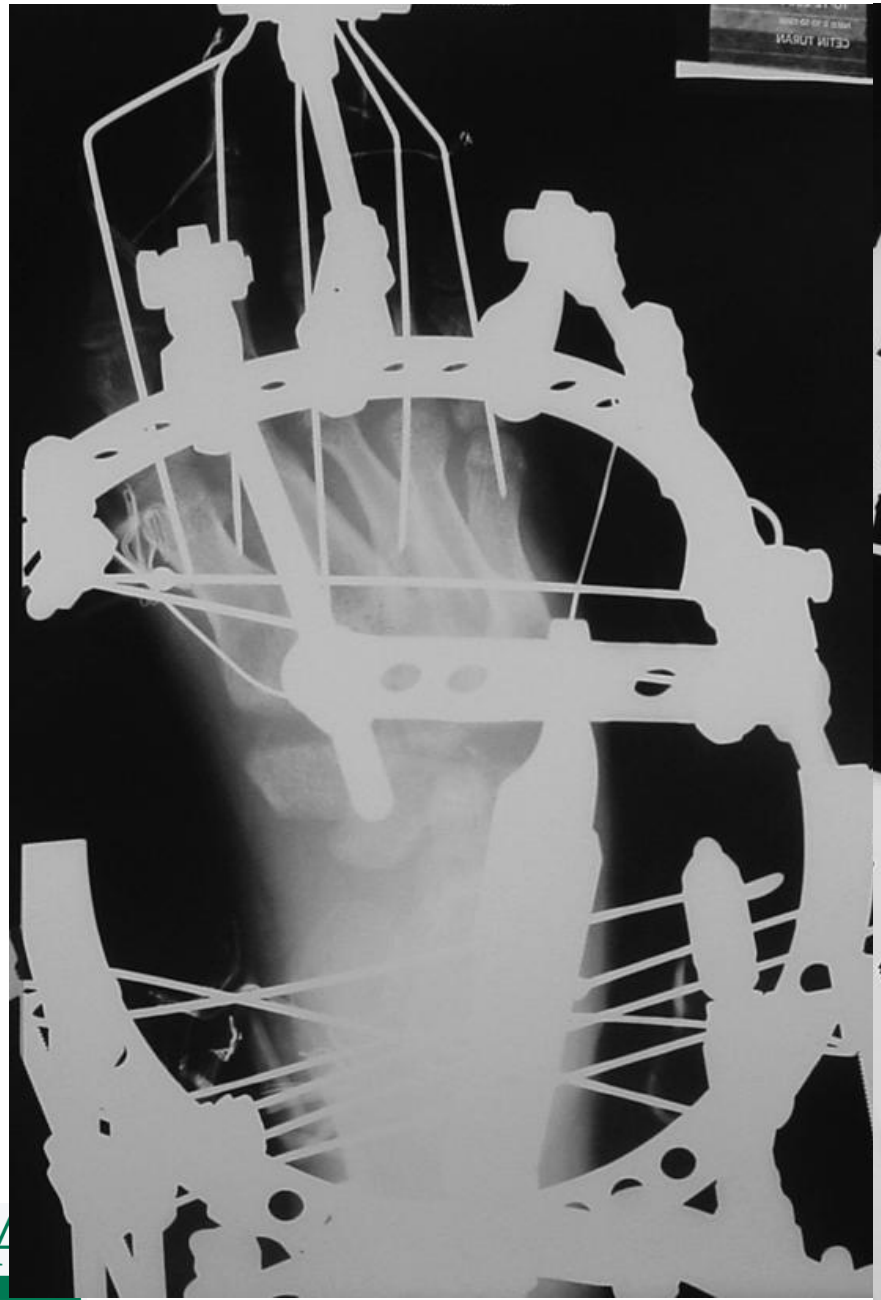
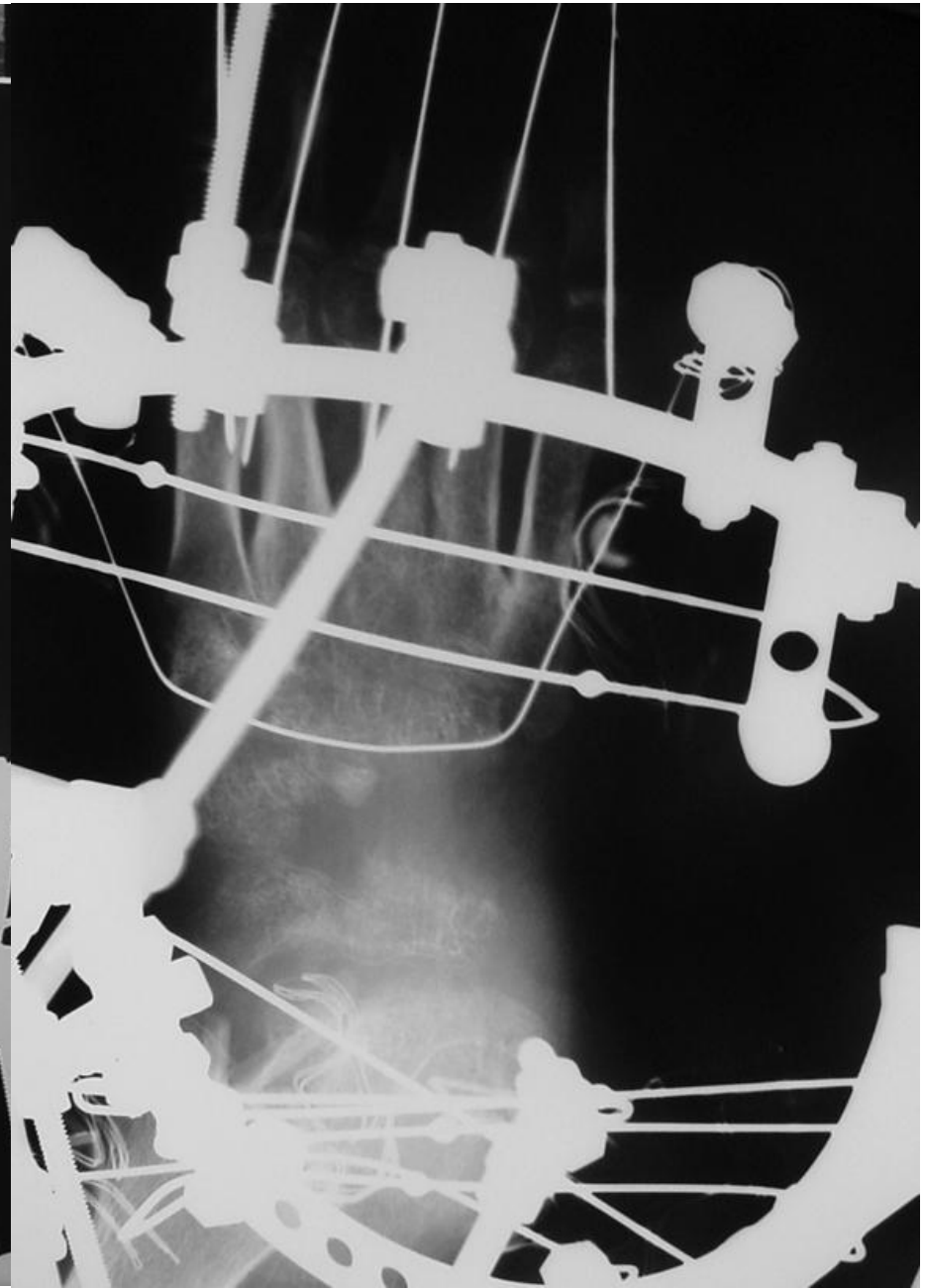
# Osteotomy of cuboid and navicular bones

# Forefoot correction





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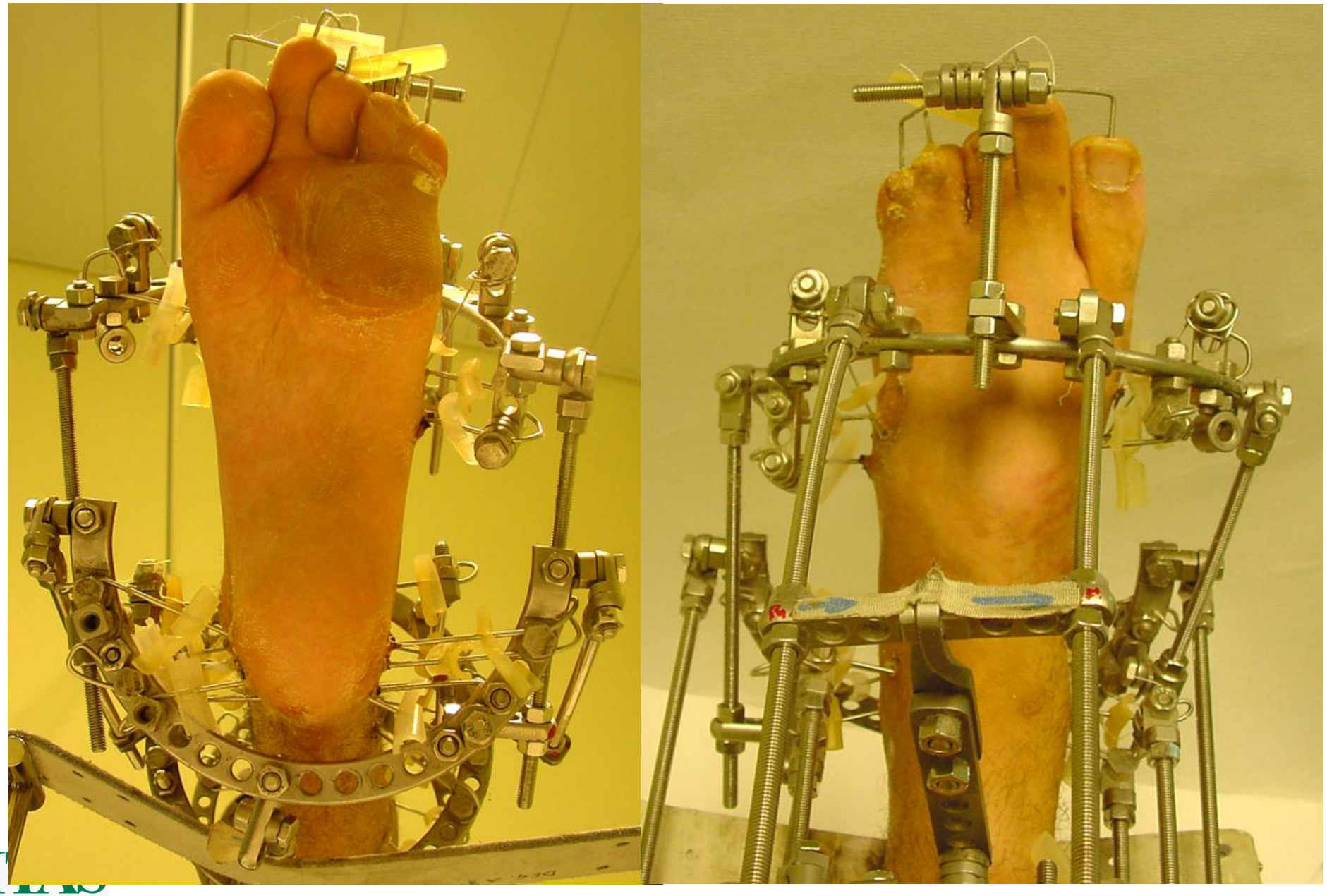
# Plantar and dorsal view



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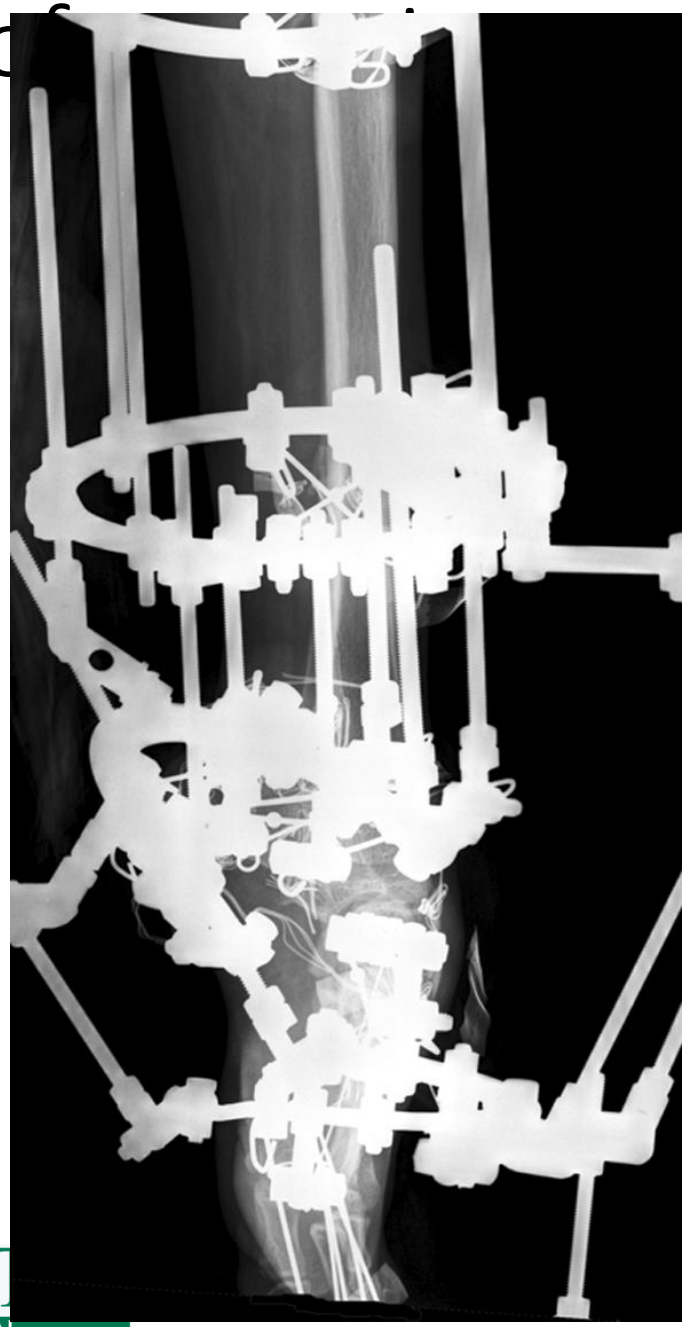
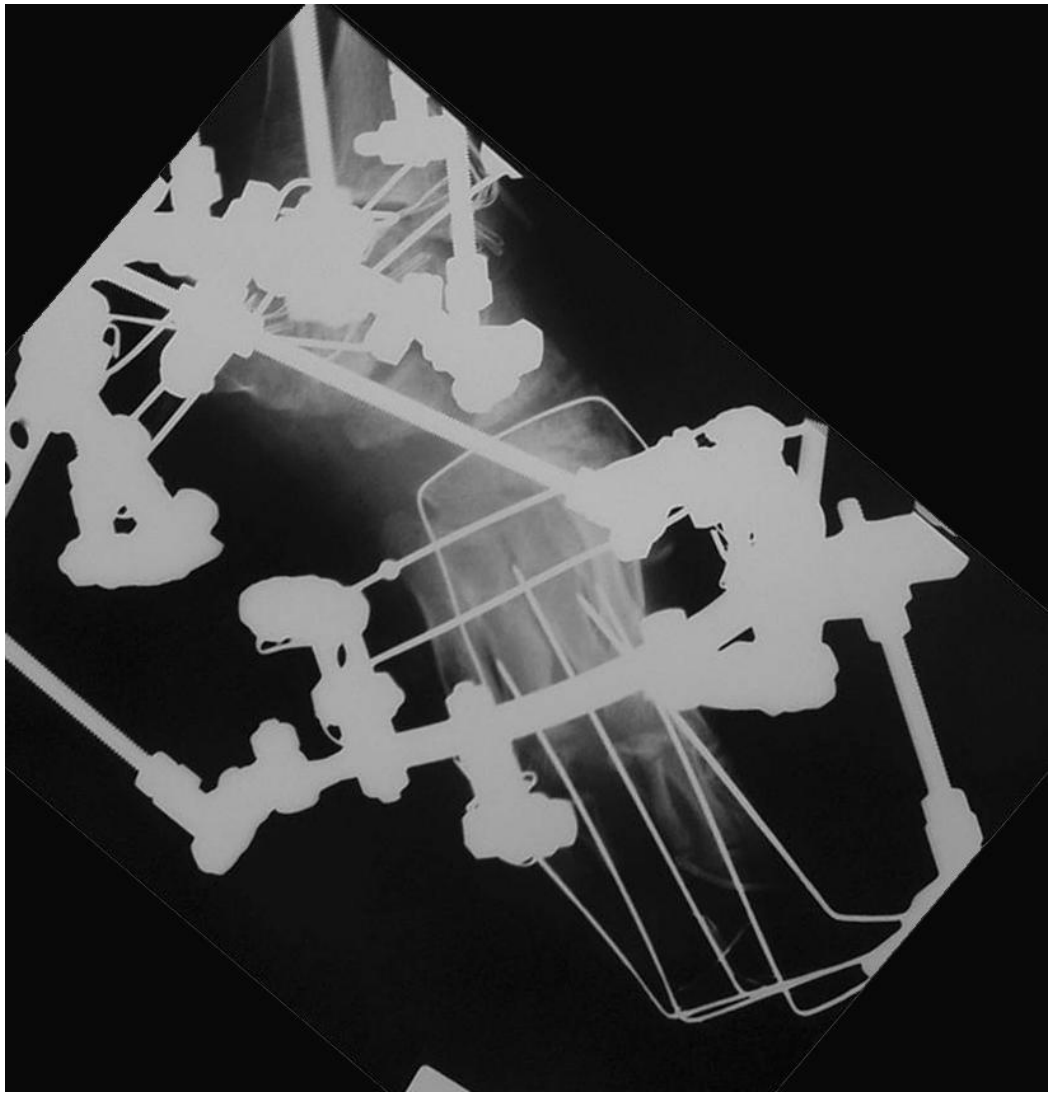
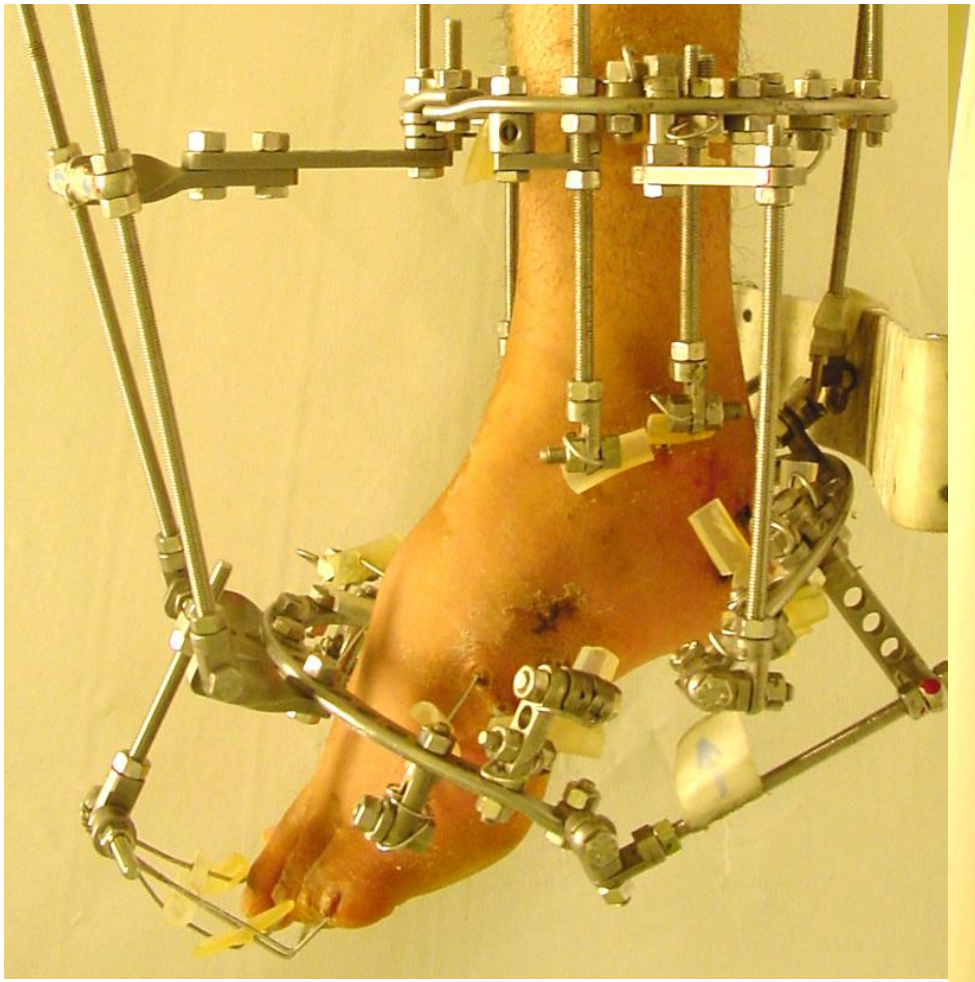
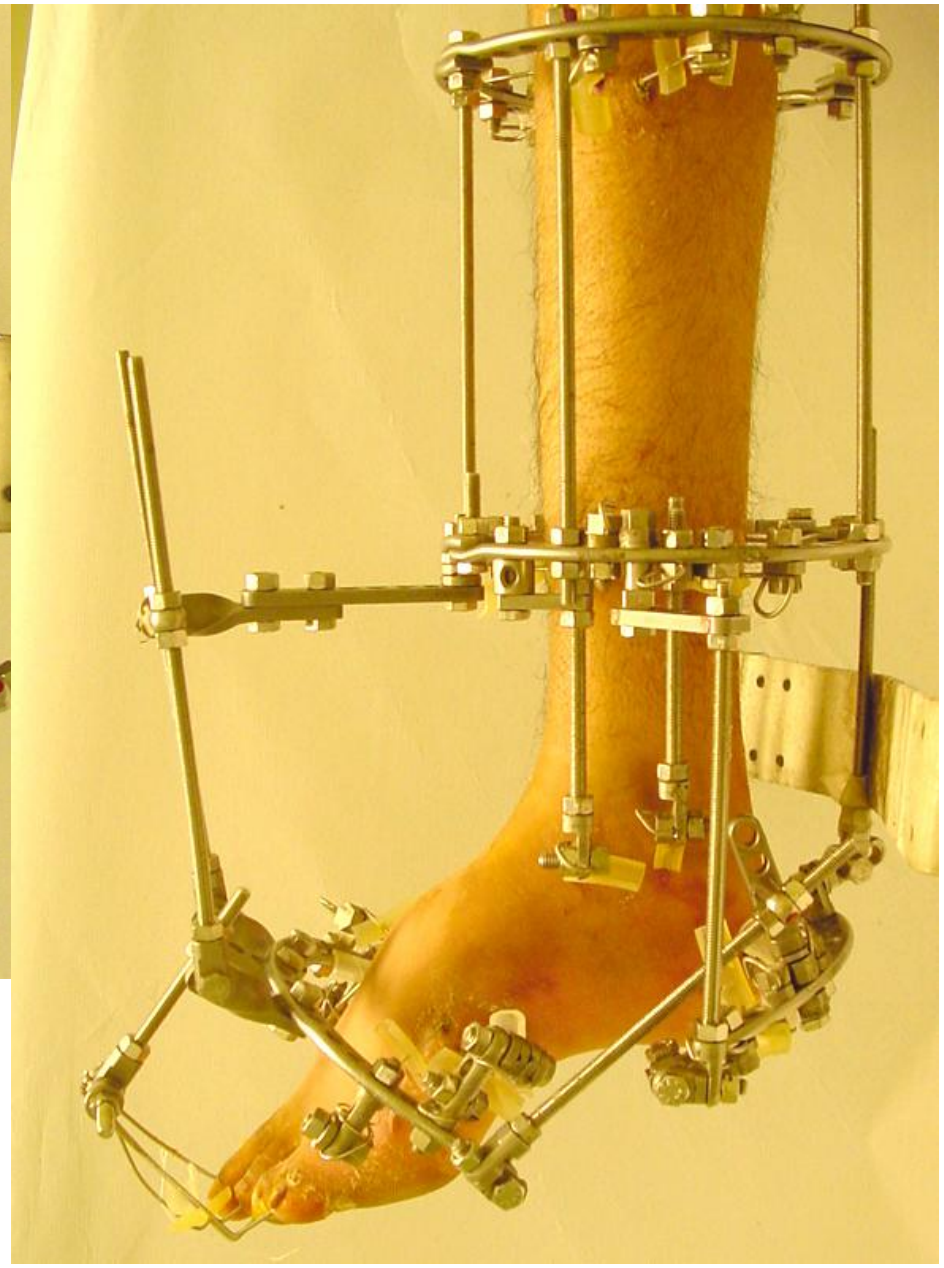
# X-rays after surgery and in the beginning





# Ilizarov during correction





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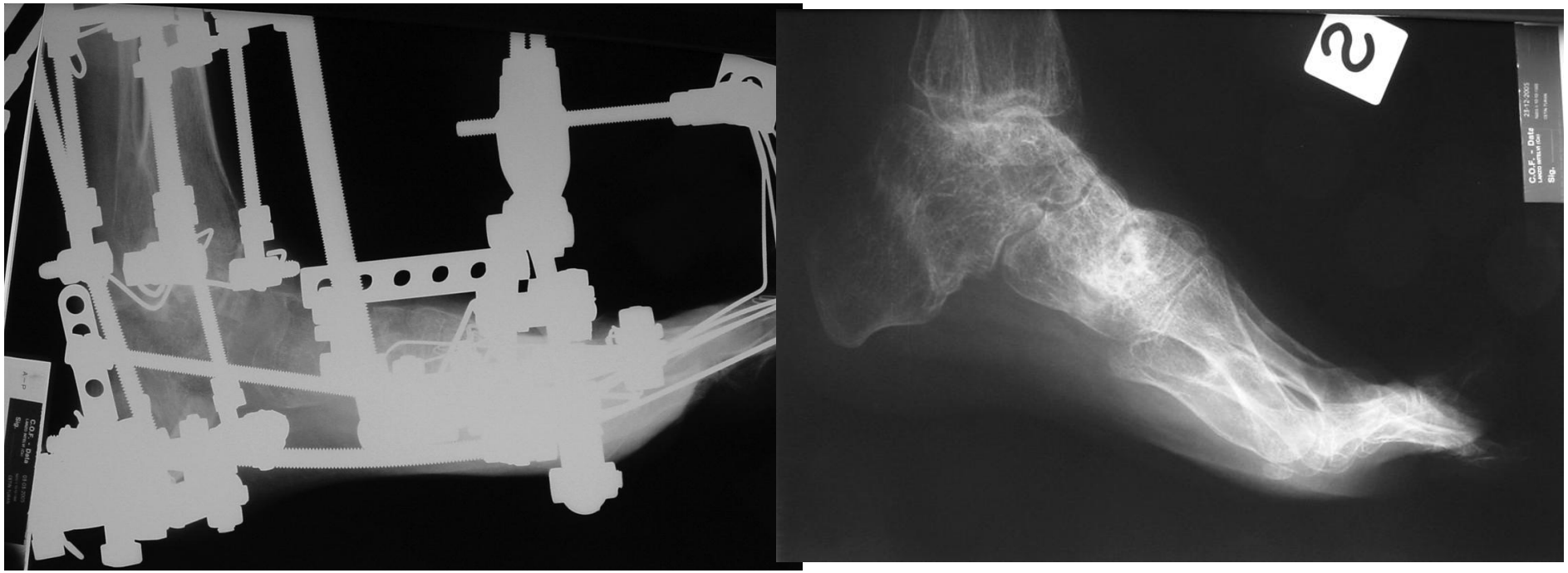
# X-rays at the end of correction and after the frame removal



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# Clinical result

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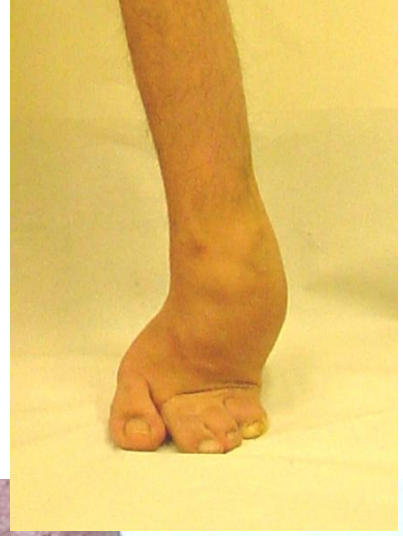
# Before and after



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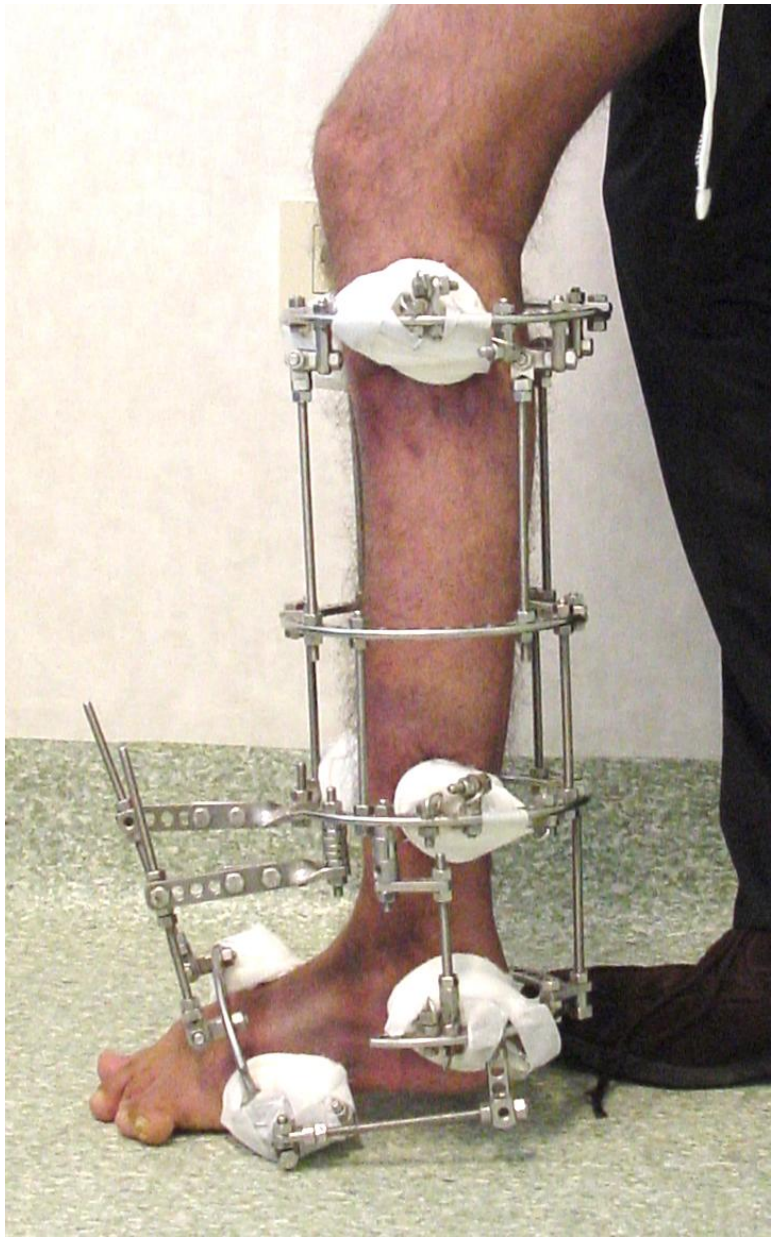
# 2nd step. Lengthening of the leg



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# Radiological result

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# Clinical result after lengthening

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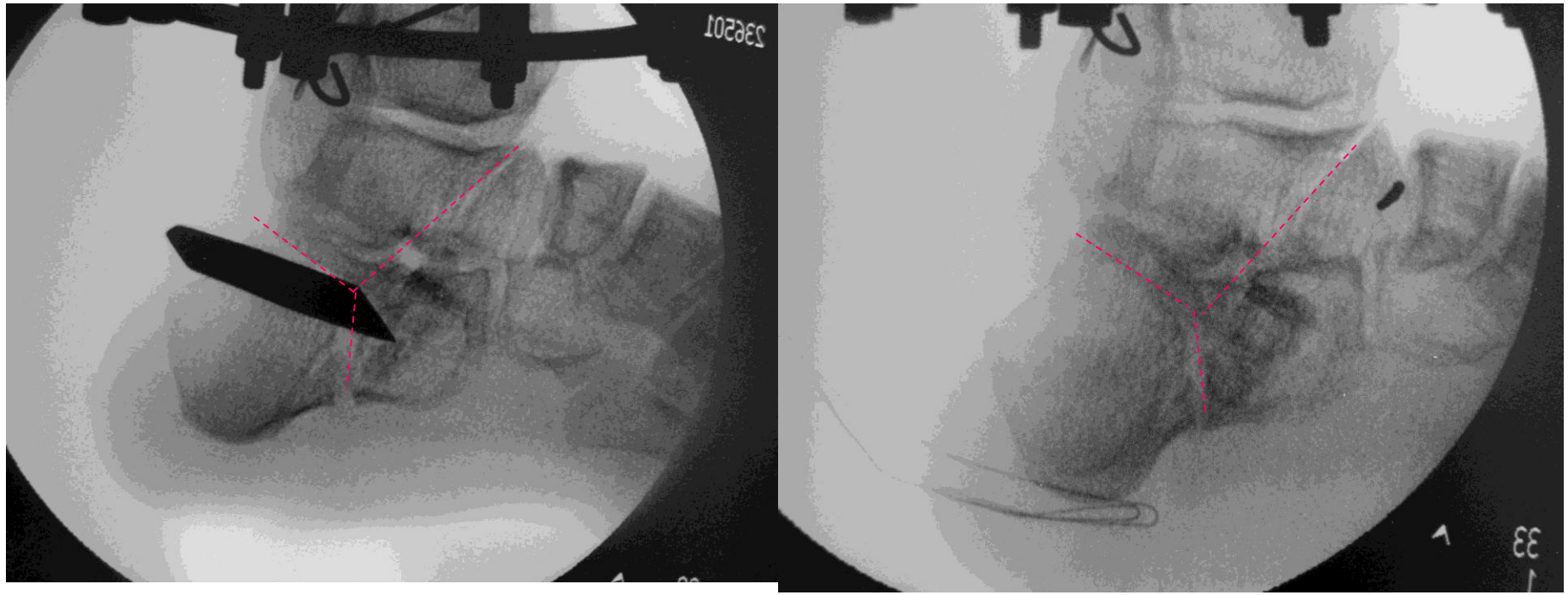
# 25 y.o. male.  Overcorrection of equno-varus foot , vertical calcaneus, weakness of plantar flexion

# Intra-operative radiographs during and after Y osteotomy



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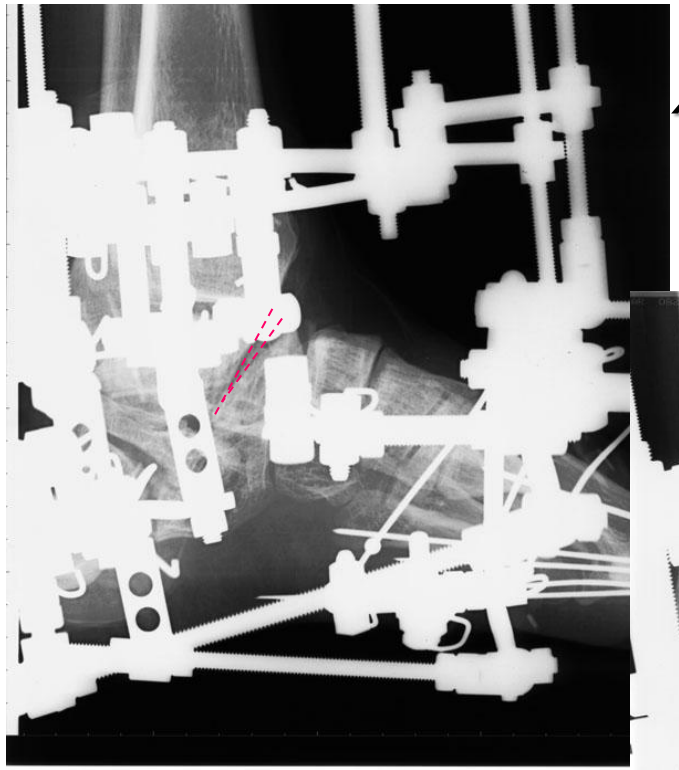
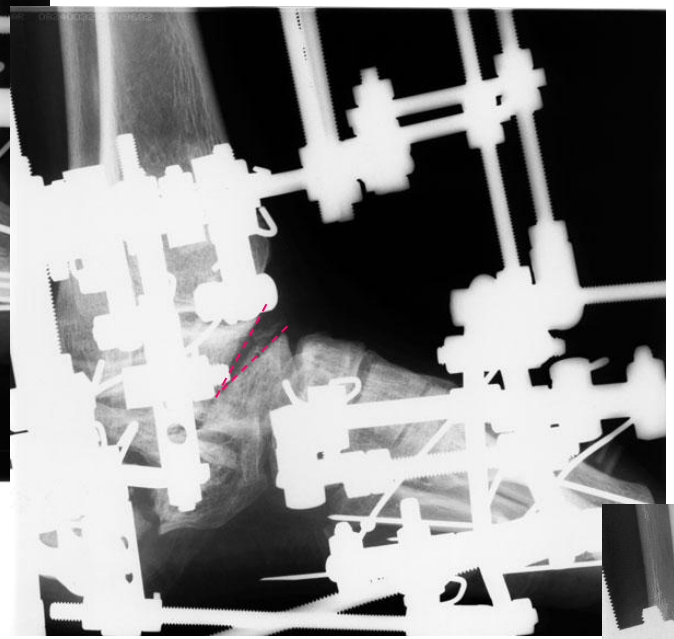
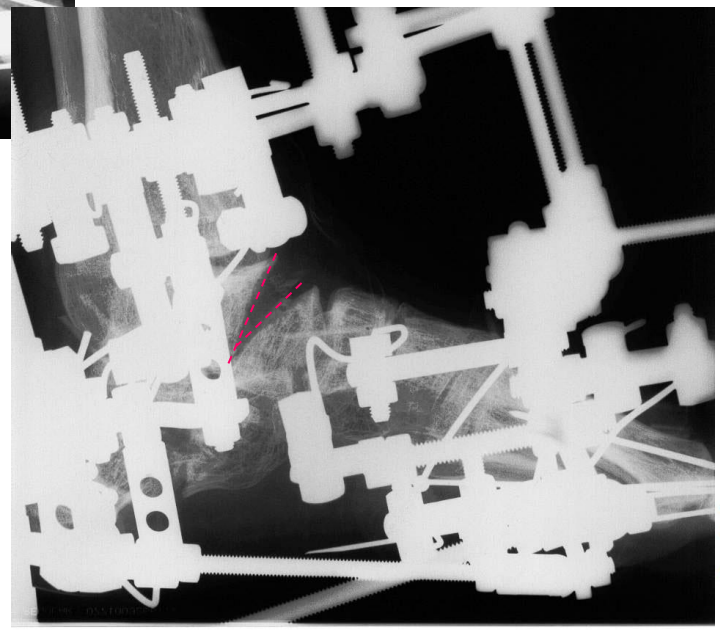


7 days of correction



20 days of correction



30 days of correction

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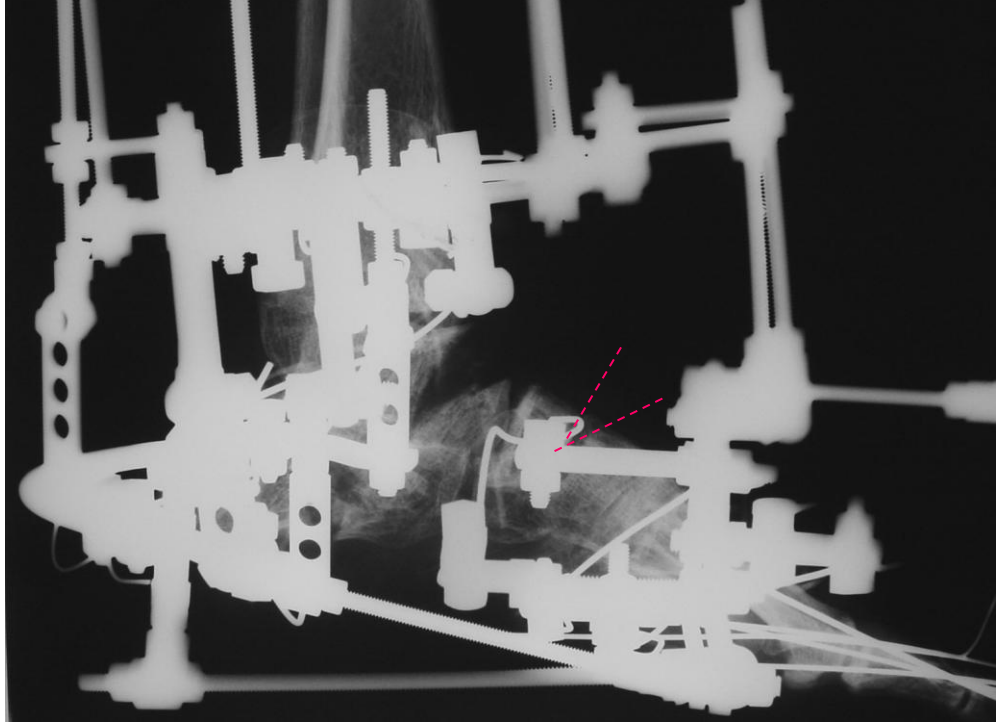
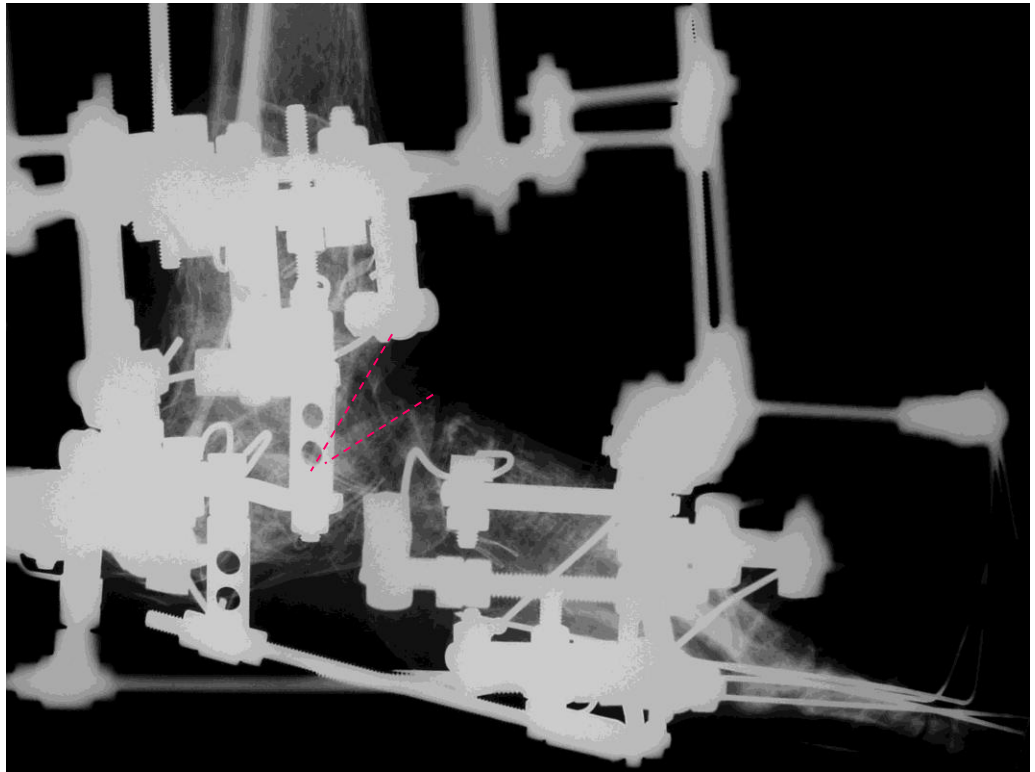


*End of distraction*



*2 months of fixation*

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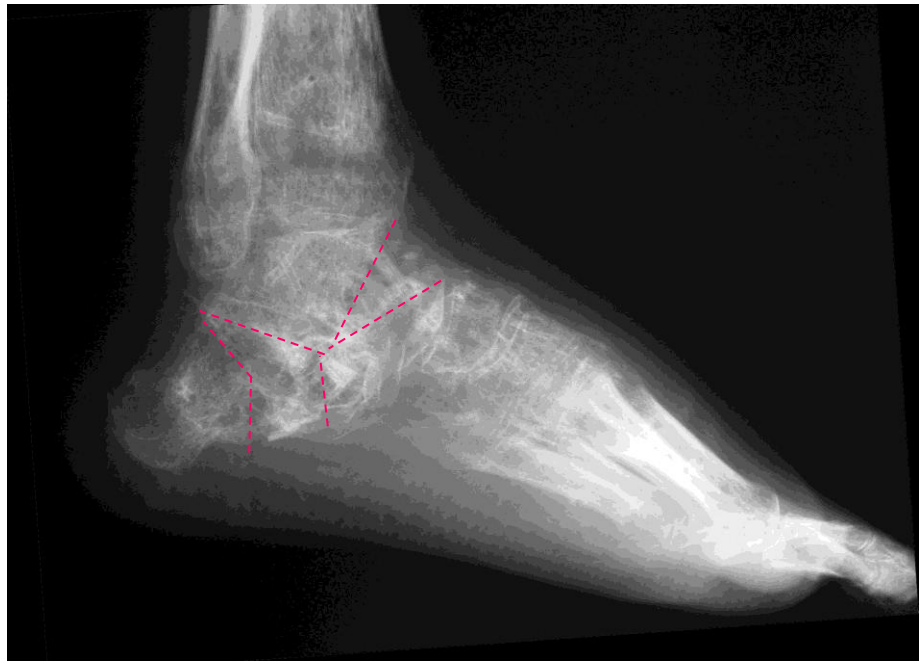
# Clinical result



Radiograph 1 month after frame removal

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# *1 year follow up*

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# Indication for arthrodesis with Ilizarov - insability

- Posttraumatic degenerative arthritis
- Reumatoid arthritis
- Neromuscular deformities with severe muscules imbalance pes
- Diabetic foot
- Neglected club foot in adults
- Sequelae of Compartment syndrom

(1st surgery-closed correction and 2nd -open arthrodesis)

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# Types of Ilizarov arthrodesis

## One-step surgery

- -Joint fusion only
- -Joint fusion and distraction through the fusion site
- -Joint fusion and distraction in the adjacent osteotomy site

## Two-step surgery

1st Closed deformity correction
2nd Subsequent joint fusion

# Types of arthrodesis of the foot joints with distraction

- Subtalar arthrodesis with lengthening
- Chopart joint arthrodesis with distraction
- Triple arthrodesis with progressive correction
- Triple arthrodesis with vertical or horizontal osteotomy of the calcaneus
- Lisfranc joint arthrodesis with distraction
- Pantalar arthrodesis and correction

16 y.o male

lesion of the external peronal nerve after knee flexion correction

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# X-rays before treatment

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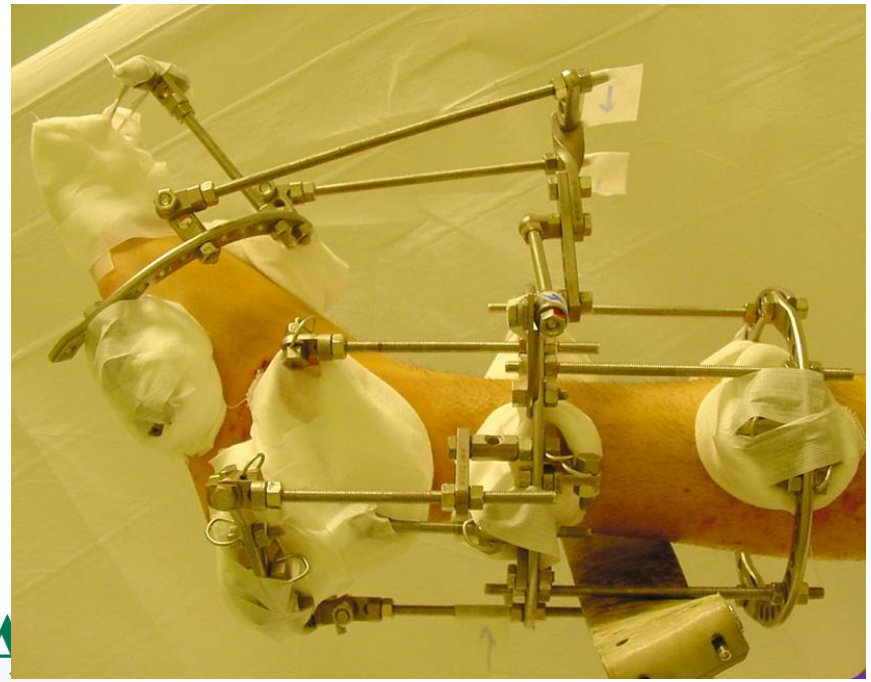
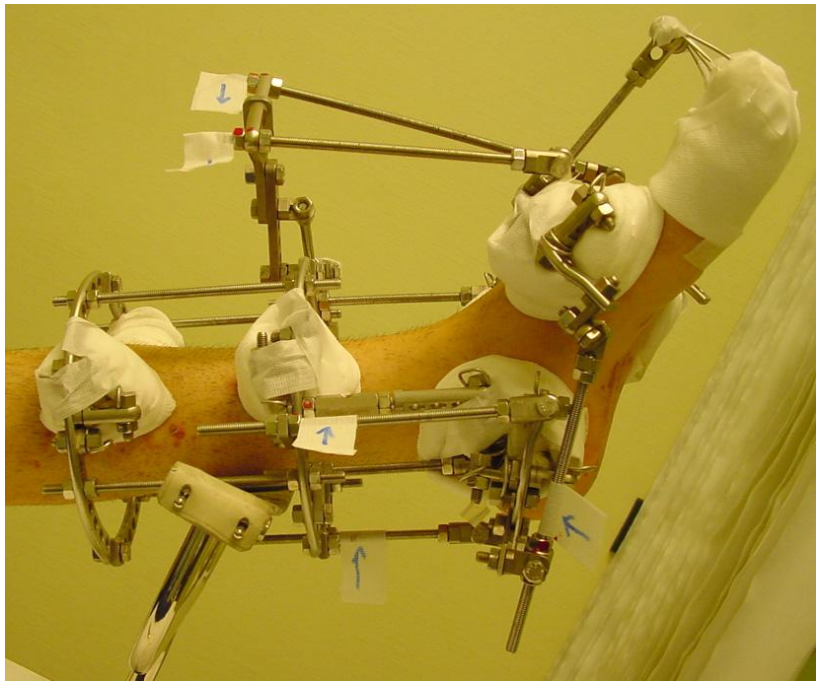
Progressive correction after Surgery





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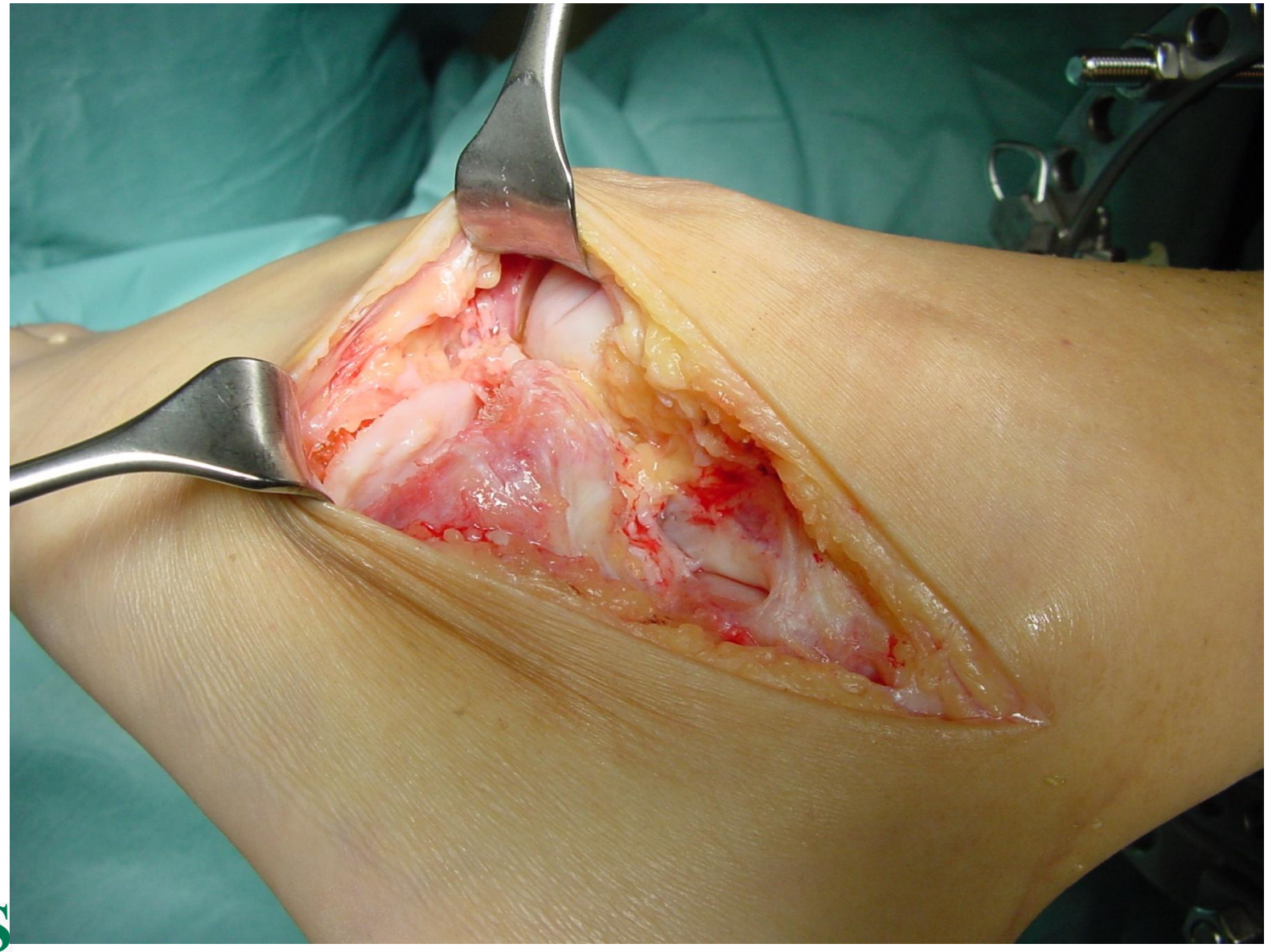
# Surgery



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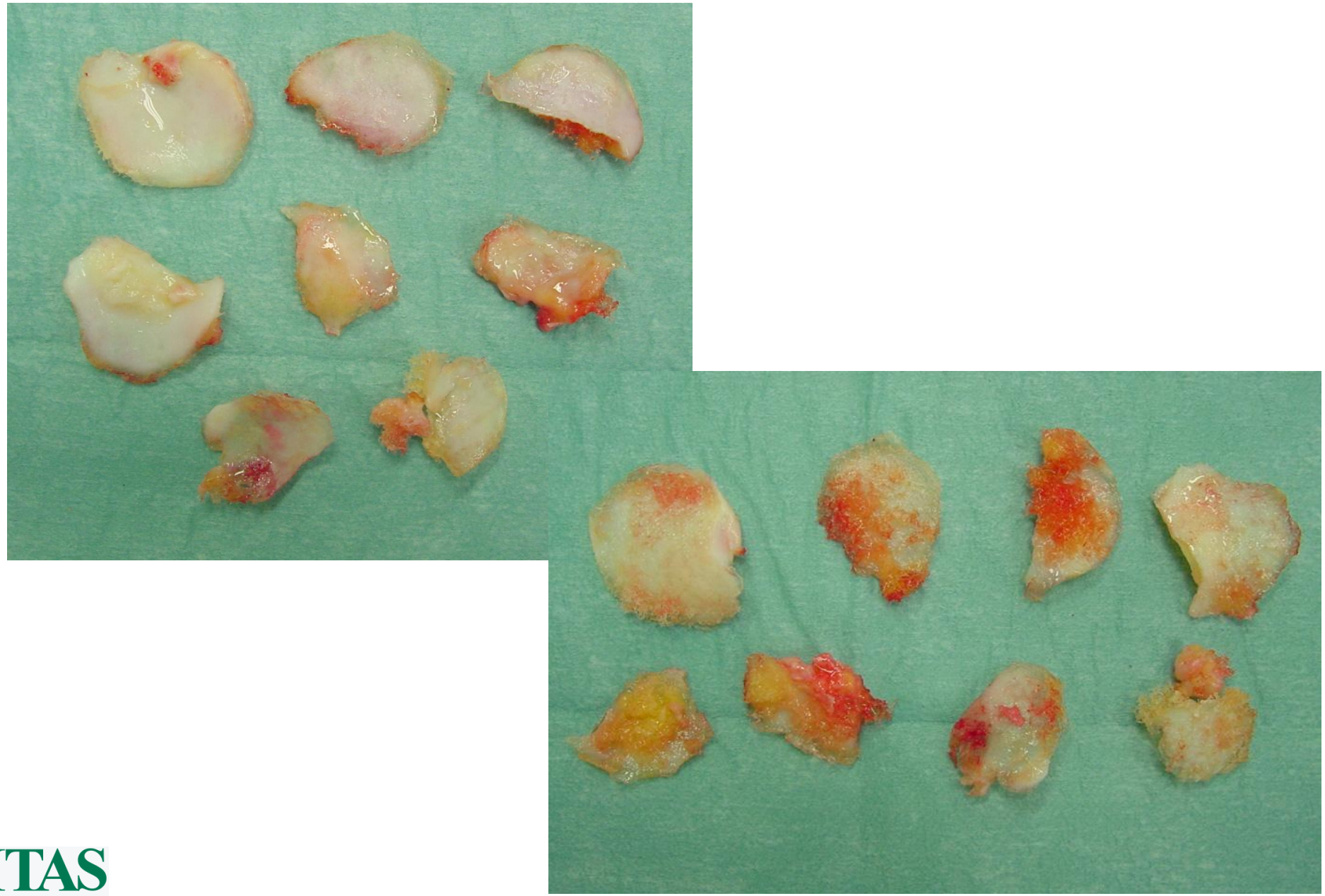
# Surgery



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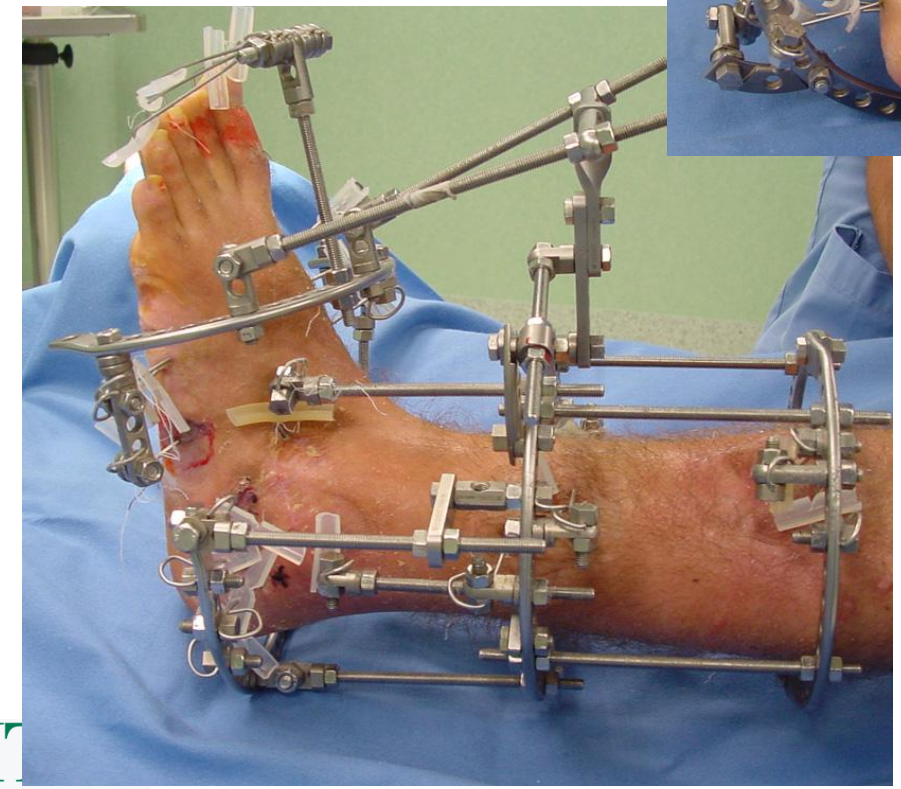
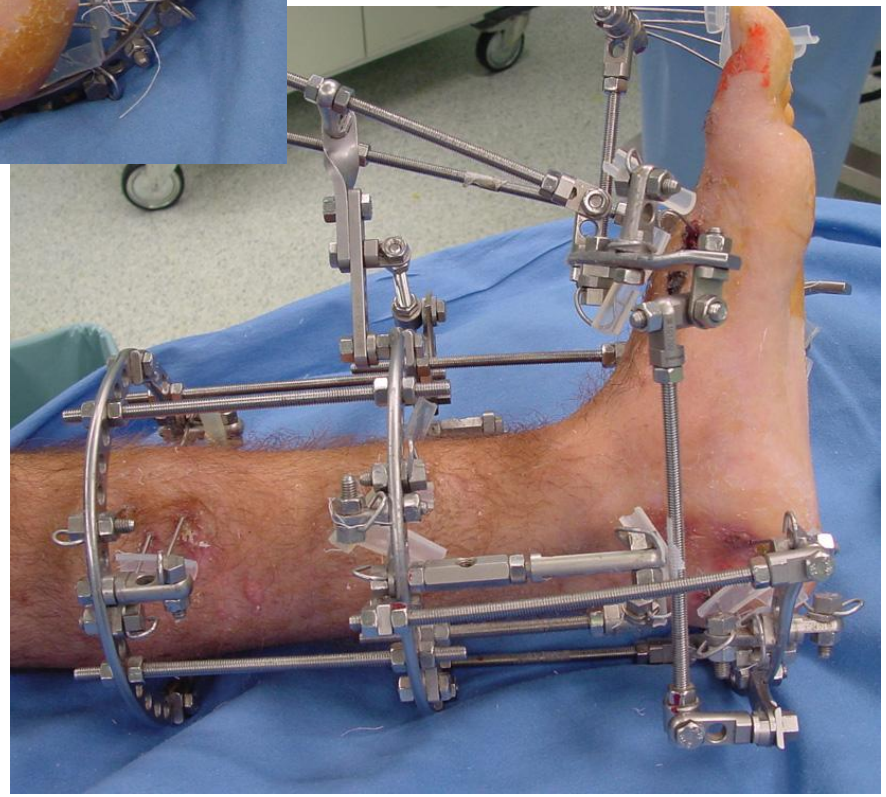
# At the End of correction





16 y.o. Male
residual club foot and
schiatic n. palsy

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# X-rays before treatment

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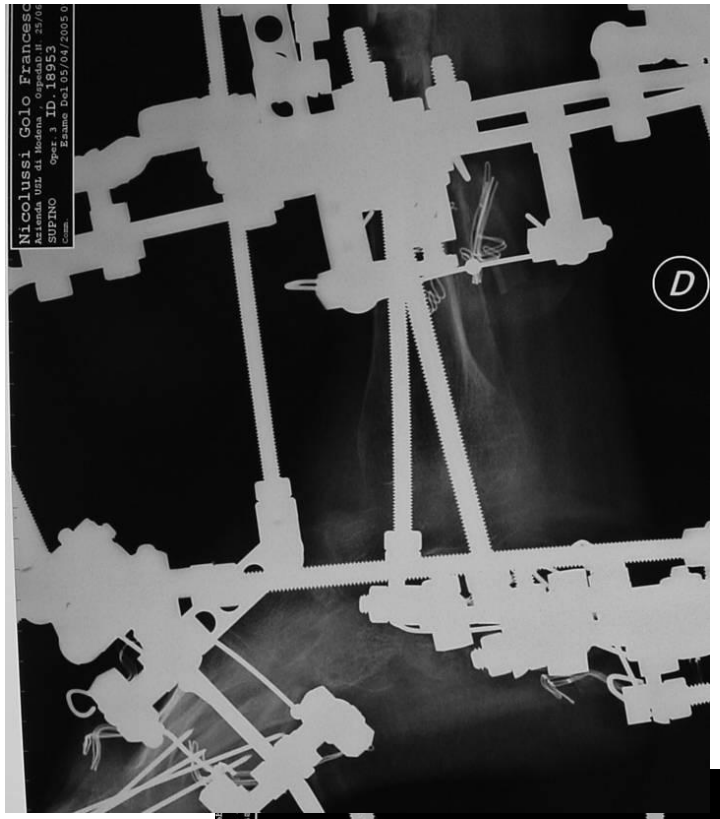
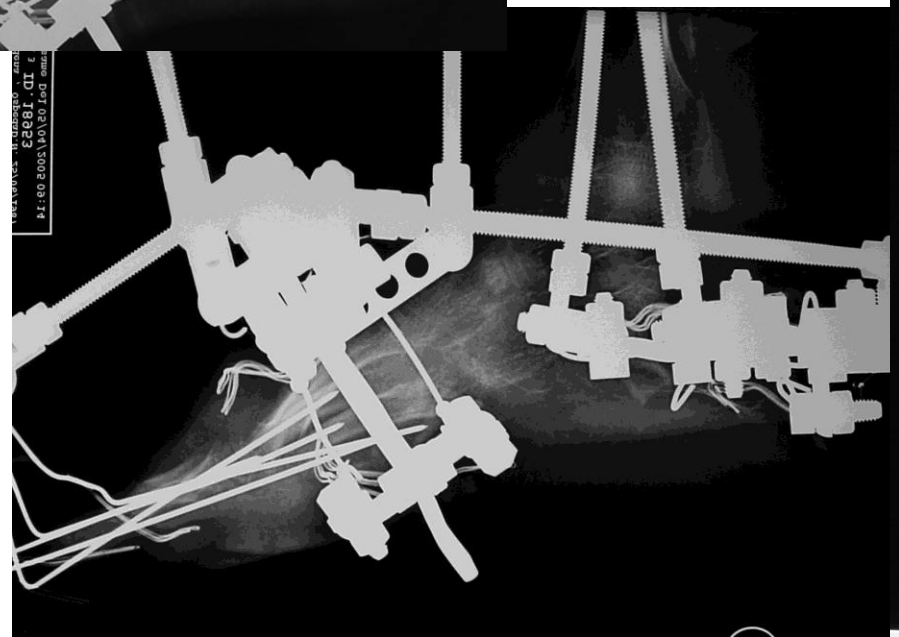
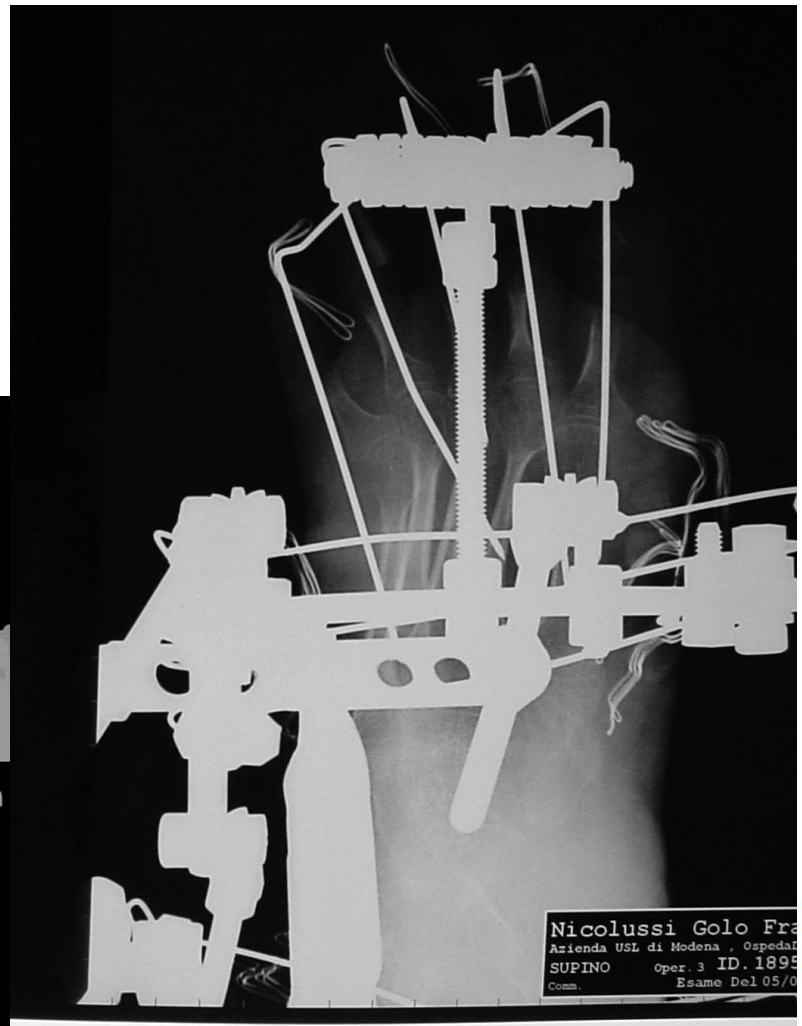
# 1 st Step: Progressive closed correction of the deformities



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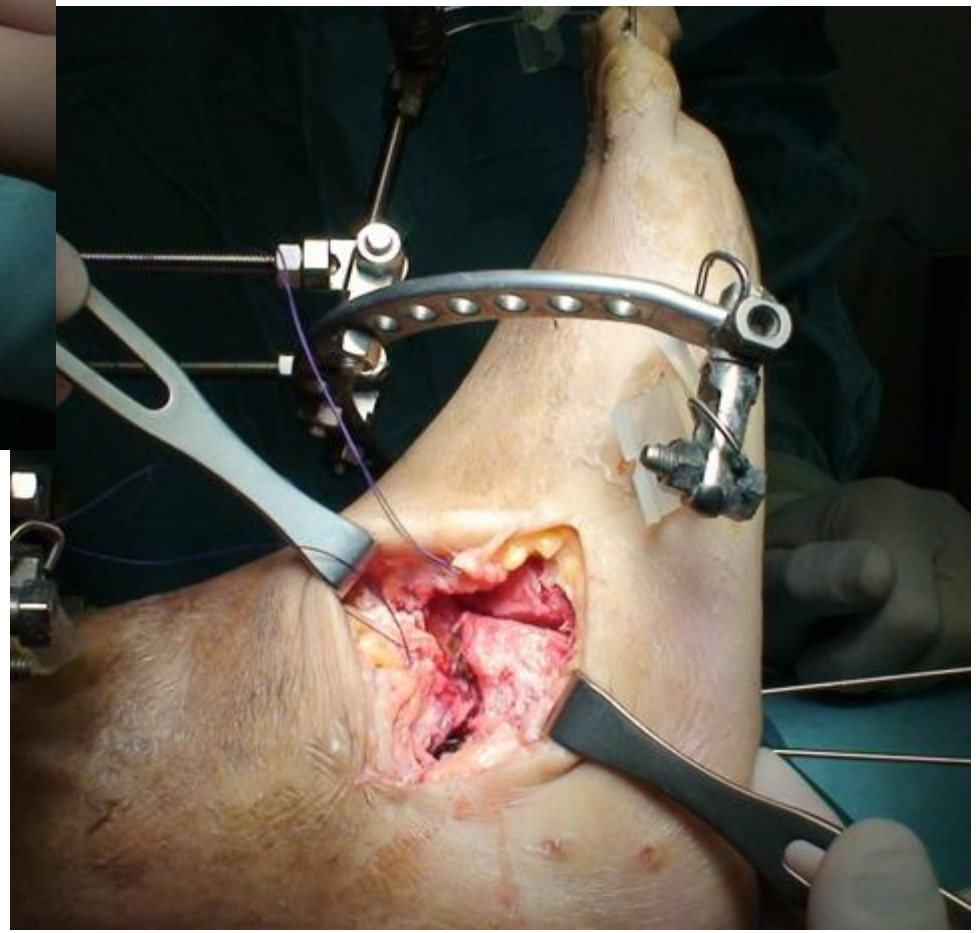
# Open triple arthrodesis



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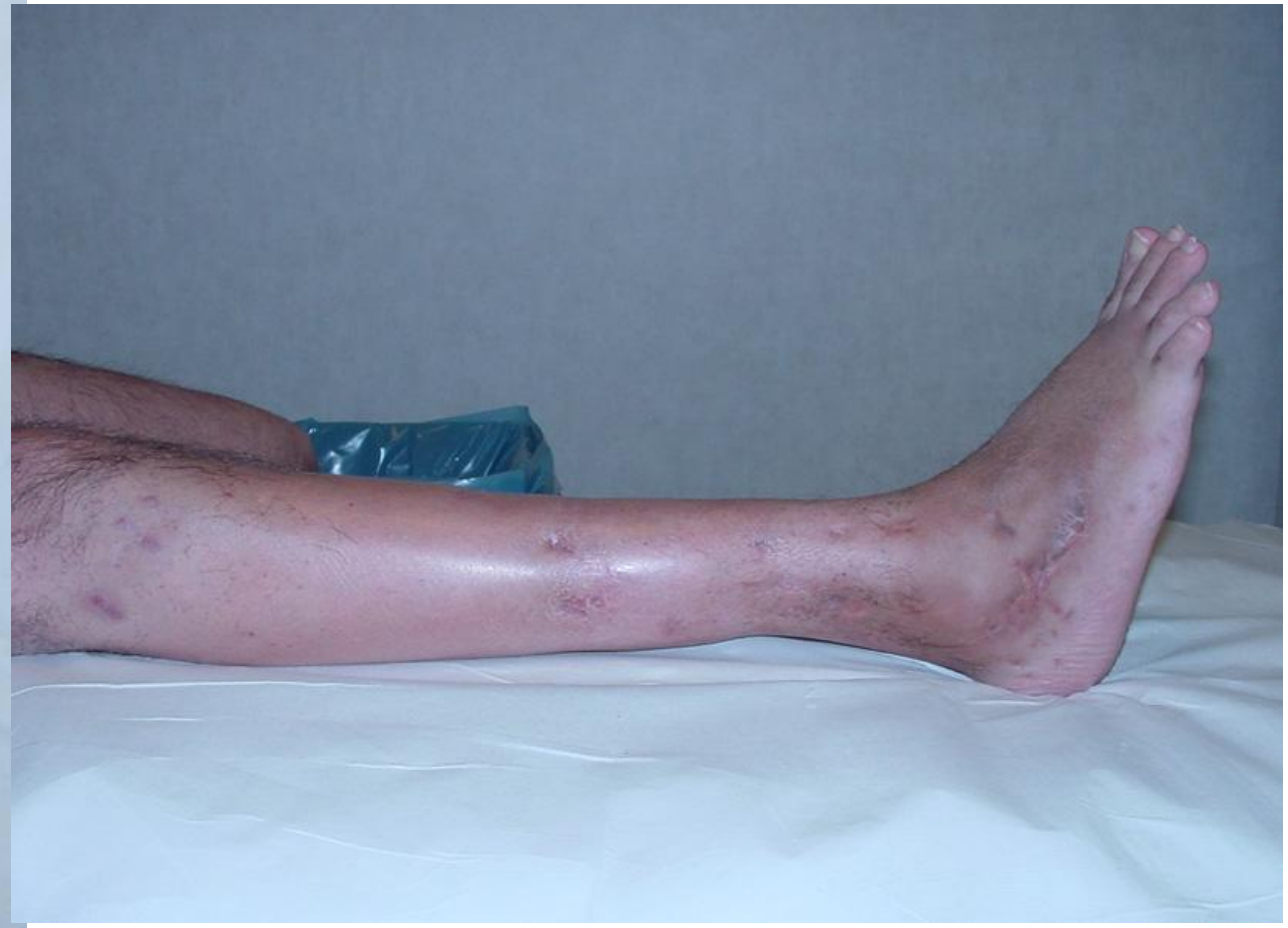
# Clinical result



# Diabetic Charcot foot. Male 56 y.o. Dislocation of Lisfranc joint



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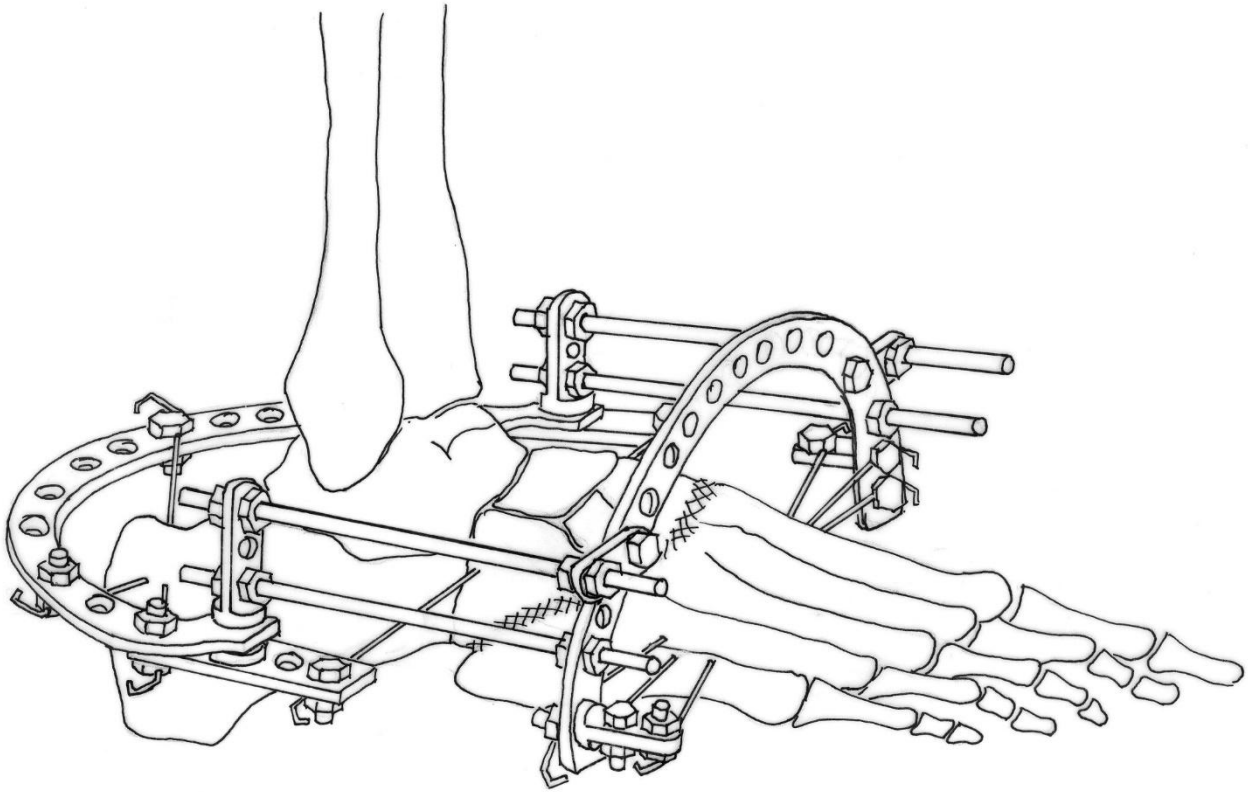
# Lisfranc joint arthrodesis



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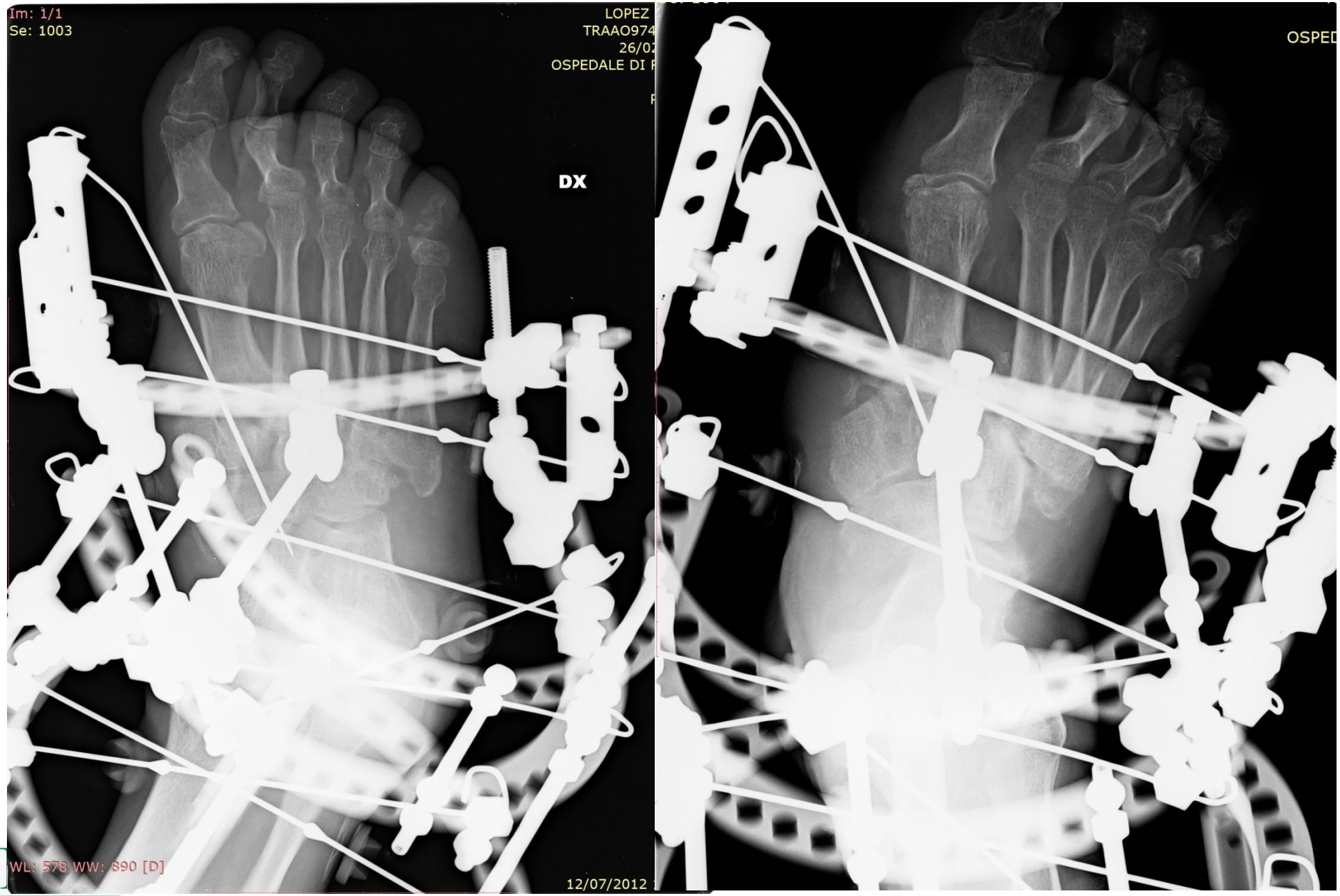


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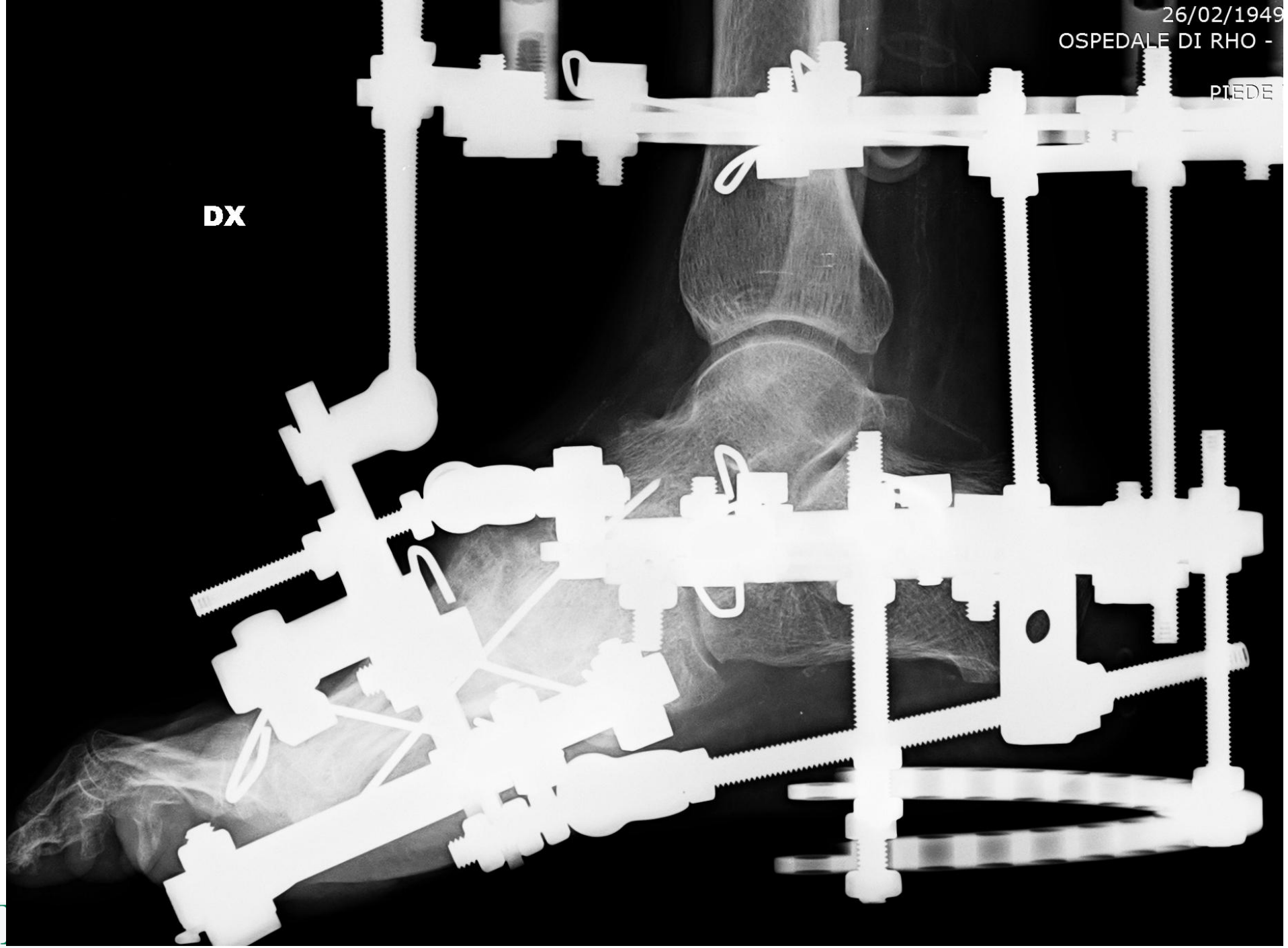


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# Risult

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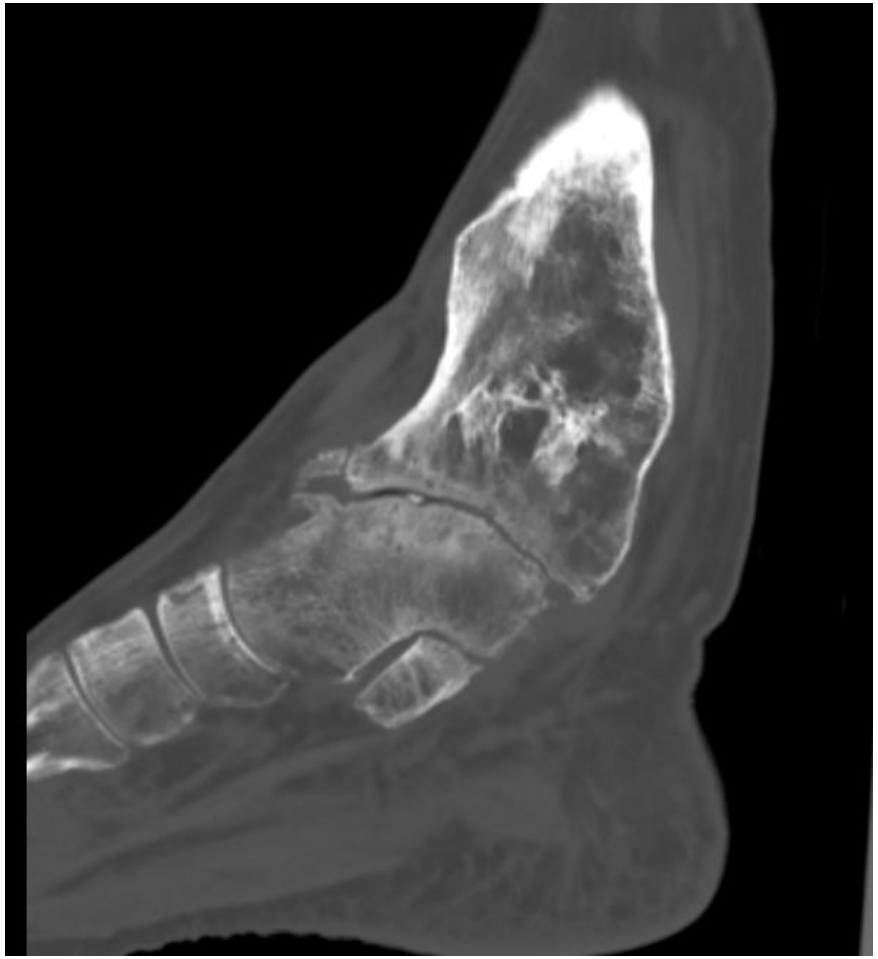
# CONCLUSIONS

- ✓Ilizarov method gave possibilities to correct axial deviation of complex foot deformity by progressive distraction.
- ✓Osteotomy and progressive correction with formation of distraction regenerated bone indicate for rigid foot, more frequently posttraumatic, hemimelic or in sequelae of many surgical procedures
- ✓In the cases of instability, muscular imbalance or neurologic problem indicate arthrodesis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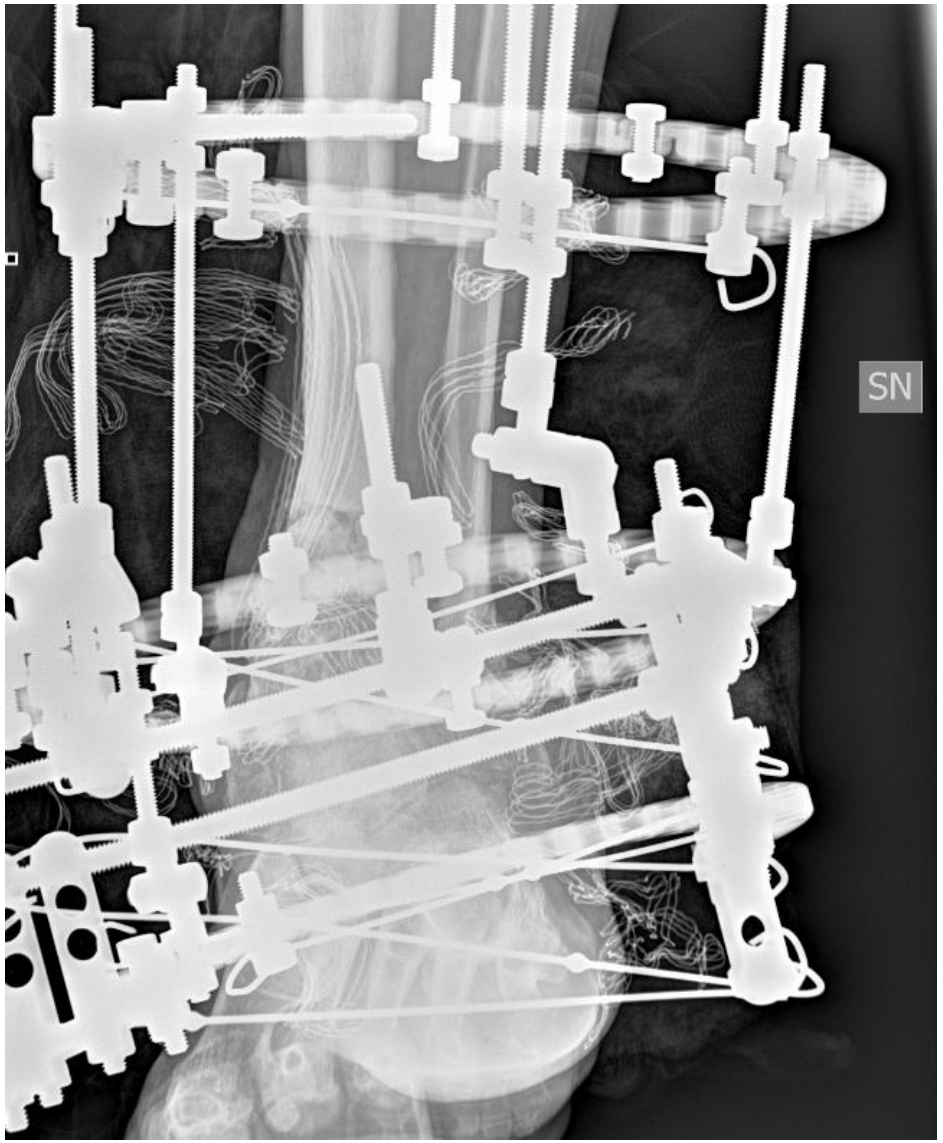
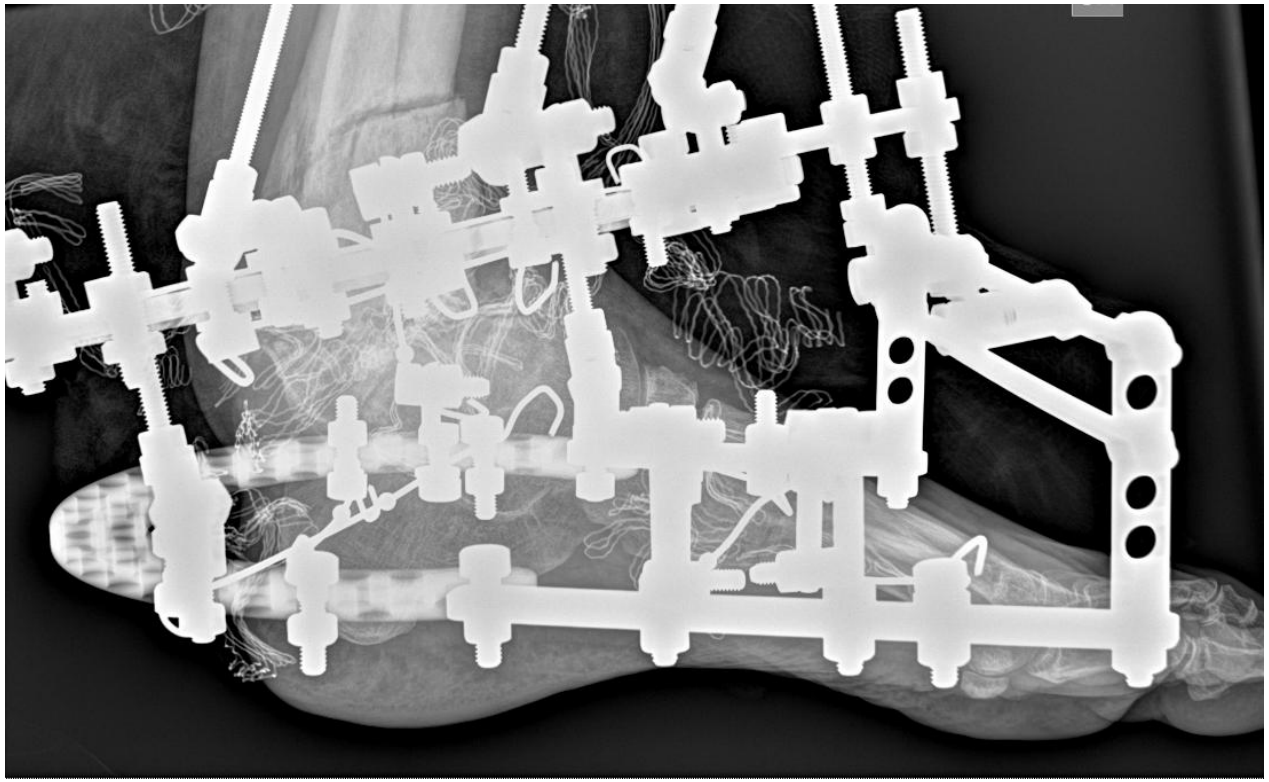
- AMPUTAZIONE TRANSTIBIALE
- PROTESI DI CAVIGLIA
- PLANTARE
- OSTEOTOMIA
- ARTRODESI



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# LENGTHENING OF THE HUMERUS WITH ILIZAROV METHOD: A RETROSPECTIVE STUDY

## Thank you

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