

**Non-Union Management:
Observations from My Career
-Long Clinical Experience**

Mexican Social Security Institute

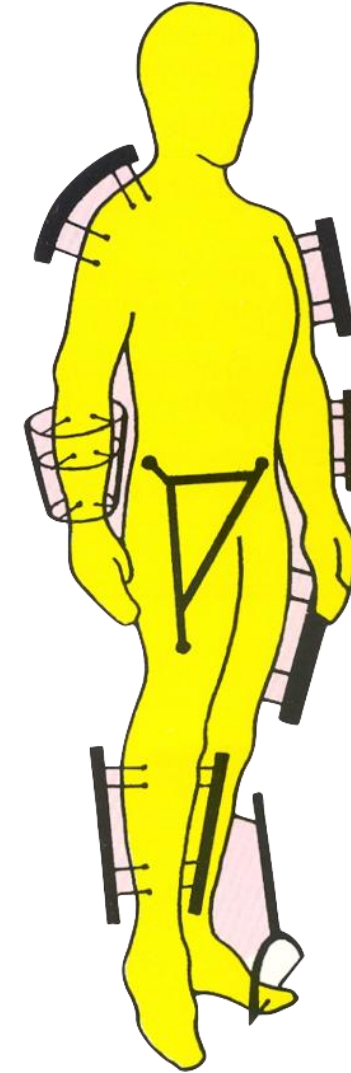
Dr. Fernando de la Huerta

NO DISCLOSURES

Post-traumatic deformities

Learning Objectives:

- Background
- Biomechanical impact of deformities
- Biological treatment of deformities
- Clinical cases
- Complications



Deformities of the long tubular bones



Non-Union



limit Function

Post-traumatic limb deformities

Can cause: Limping

An abnormal pressure
on the joints

Can lead to
painful arthritis
of the Hip,
knee or ankle



Lower Limb Length discrepancy

Results in marked
impairment of form
functions of the
locomotor system



Post-traumatic limb deformities

Fractures may heal
incorrectly

Causing:
Deformity of the
Limb



Post-traumatic limb deformities

Larger differences
can affect
well-being
and quality of life



Method

1. Correction
2. Stabilization
2. Compression
- 3 weeks
3. Distraction



Axial COMPRESSION



mechanical stability



Bone Formation

Post-traumatic limb length discrepancies

Method

Interventions:

Distraction
osteogenesis is a
method used to
lengthen bone .



Ilizarov GA: *Transosseous Osteosynthesis*. Berlin, Germany,
Springer-Verlag, 1991.



42 year-old-woman
femoral nonunion

Limb discrepancy 6 cms
varus deviation

D

ION EN VARO

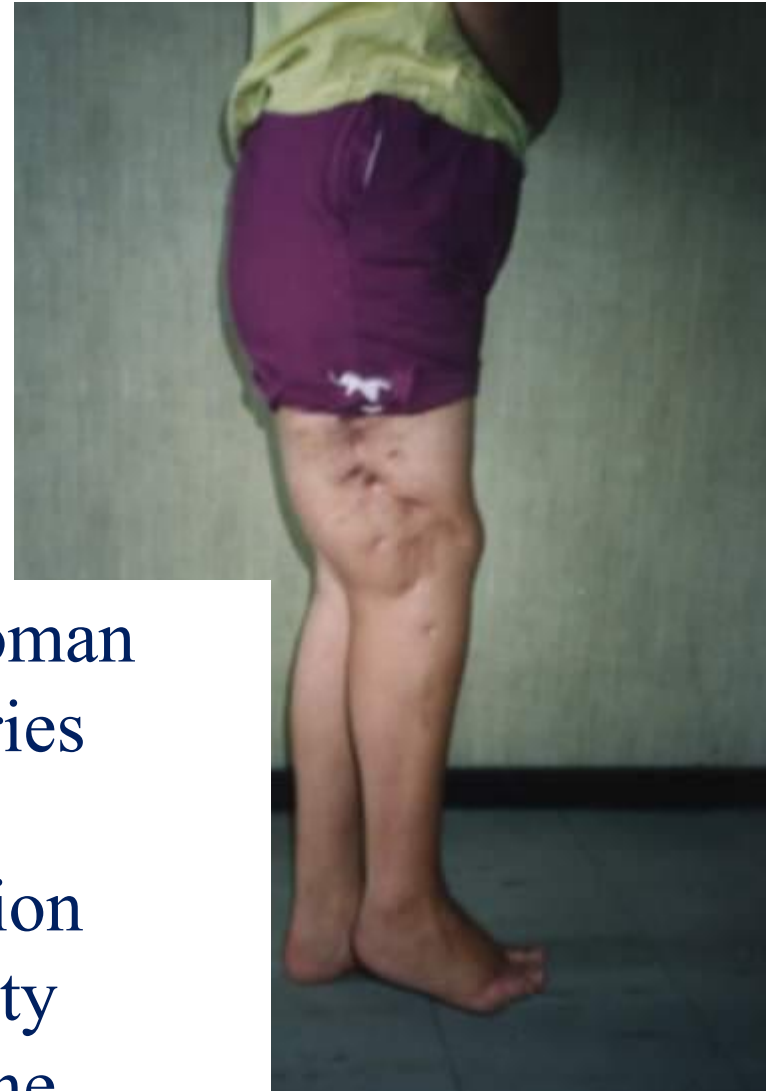


COMPRESSION-DISTRACTION



COMPRESSION-DISTRACTION

Hypertrophic nonunion can be distracted to correct deformity
and create new bone



26 year-old-woman
multiple surgeries
Failed
femoral nonunion
valgus deformity
shortening of the
femur 6 cms



COMPRESSION-DISTRACTION





26 year-old-woman

Motor vehicle

Traffic injury 2009

Left Femoral fracture:

Plate

IMN

INFECTION

IMN Removed

External Fixator

healed fracture with

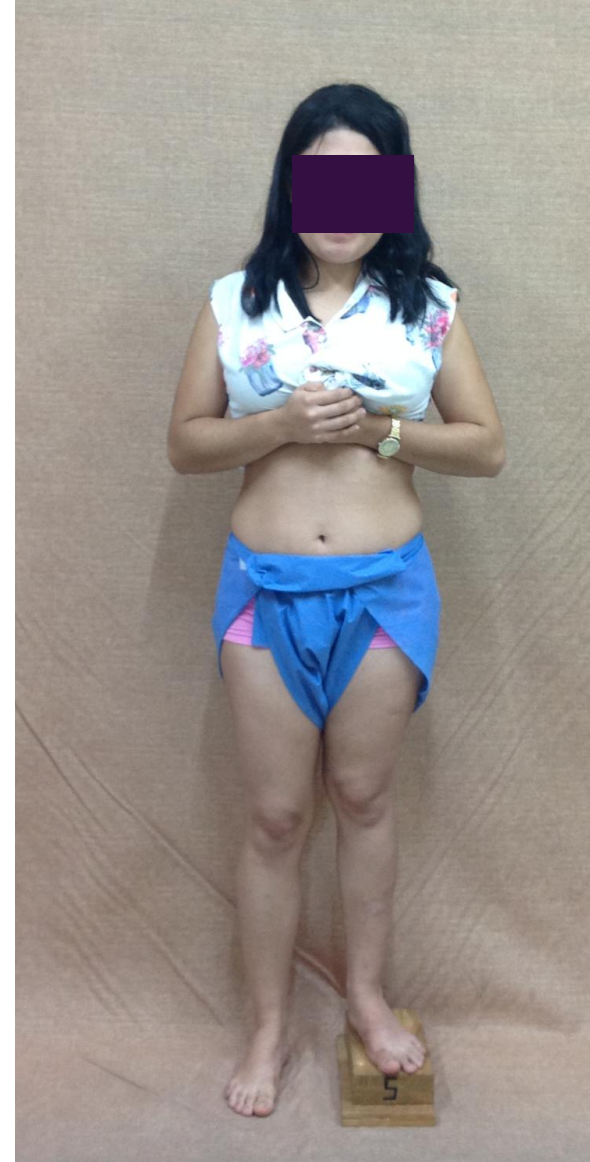
malalignment (Valgus)

shortening 8 (cms)

Post-traumatic limb deformities

Limb length
discrepancy

Lower Limb
> 5 cms





Disparity of Knee joints



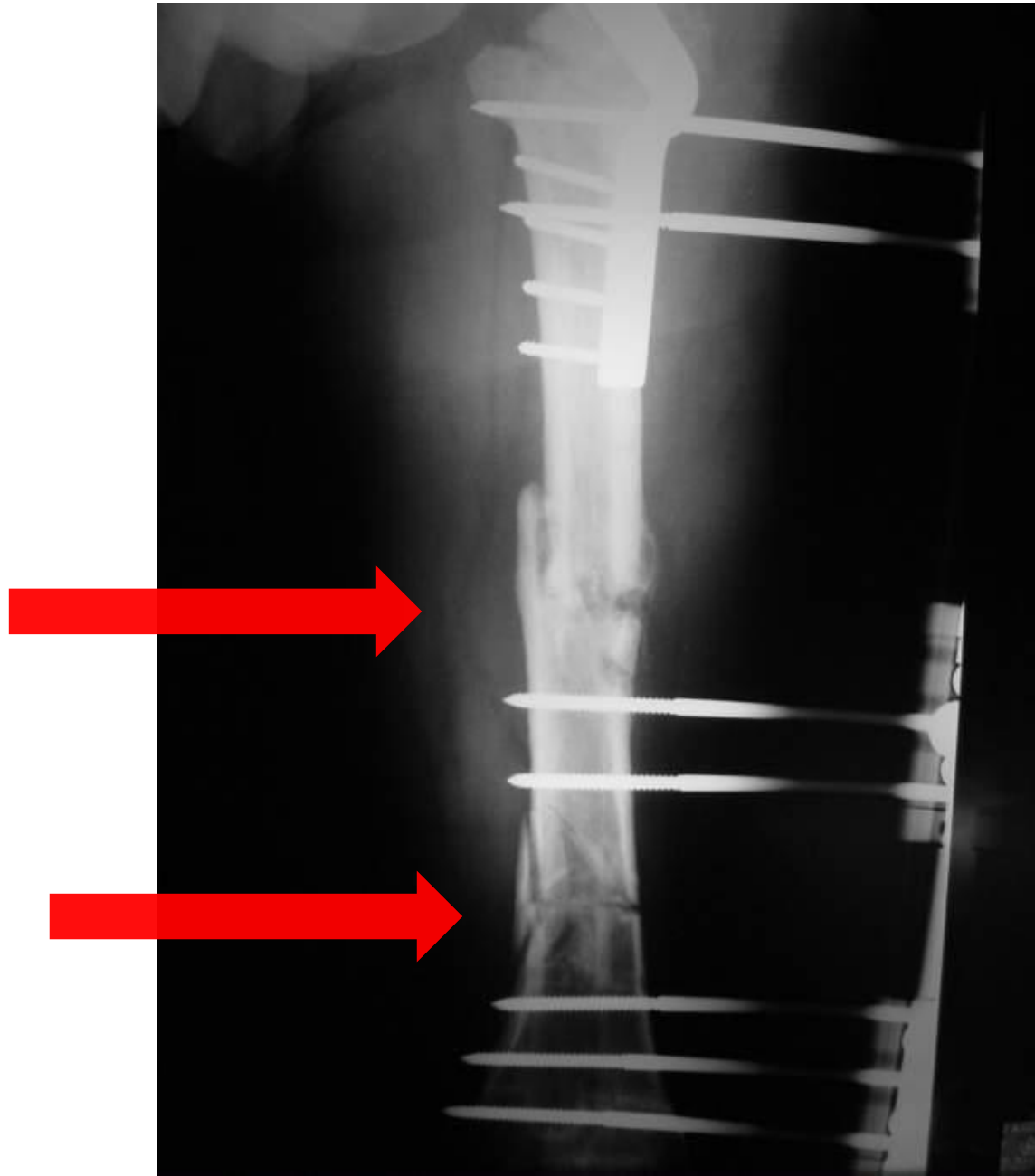


Disparity Correction

Simultaneously
Correction

Pseudarthroses
in Compression

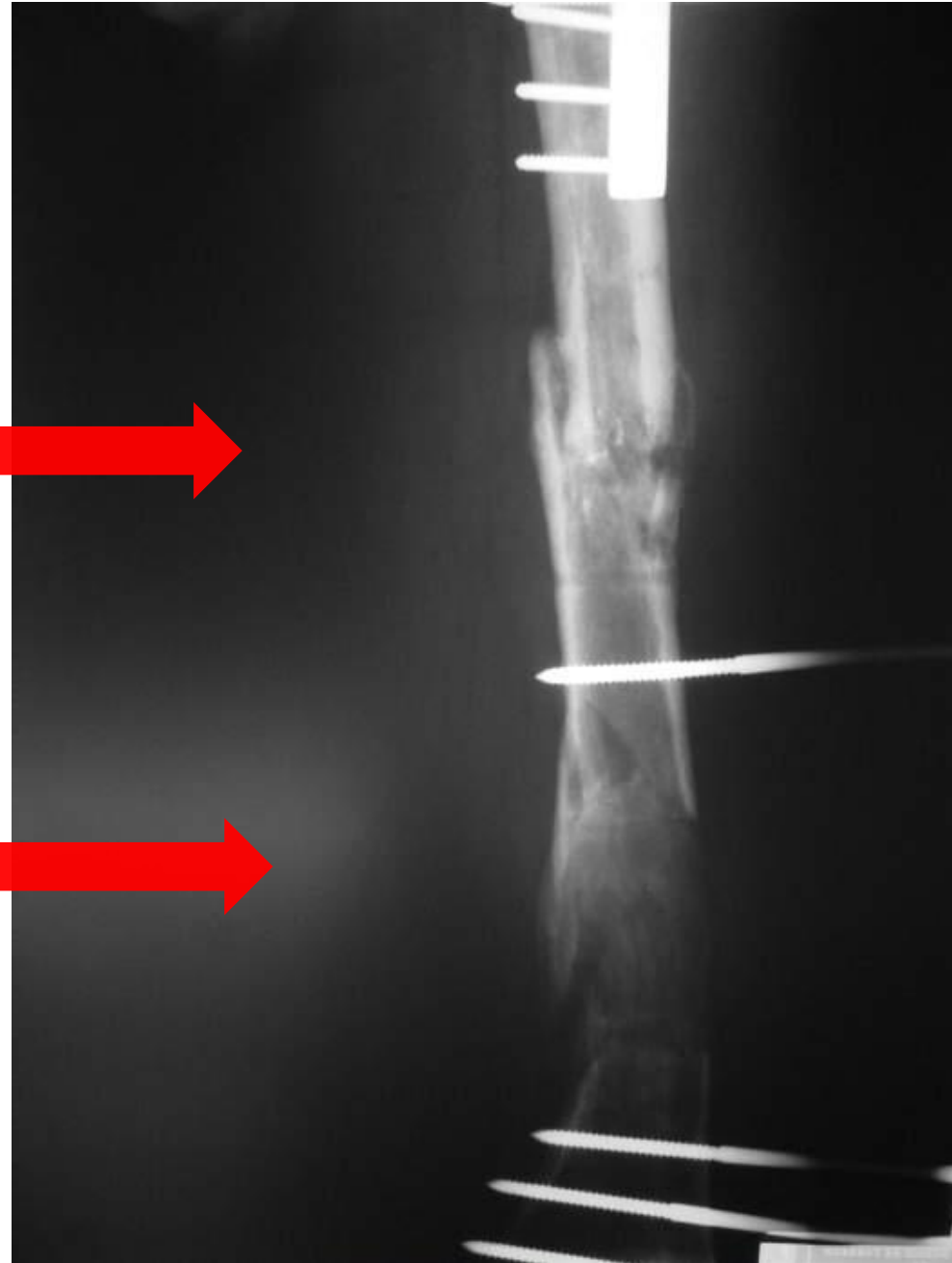
Corticotomy
Distraction

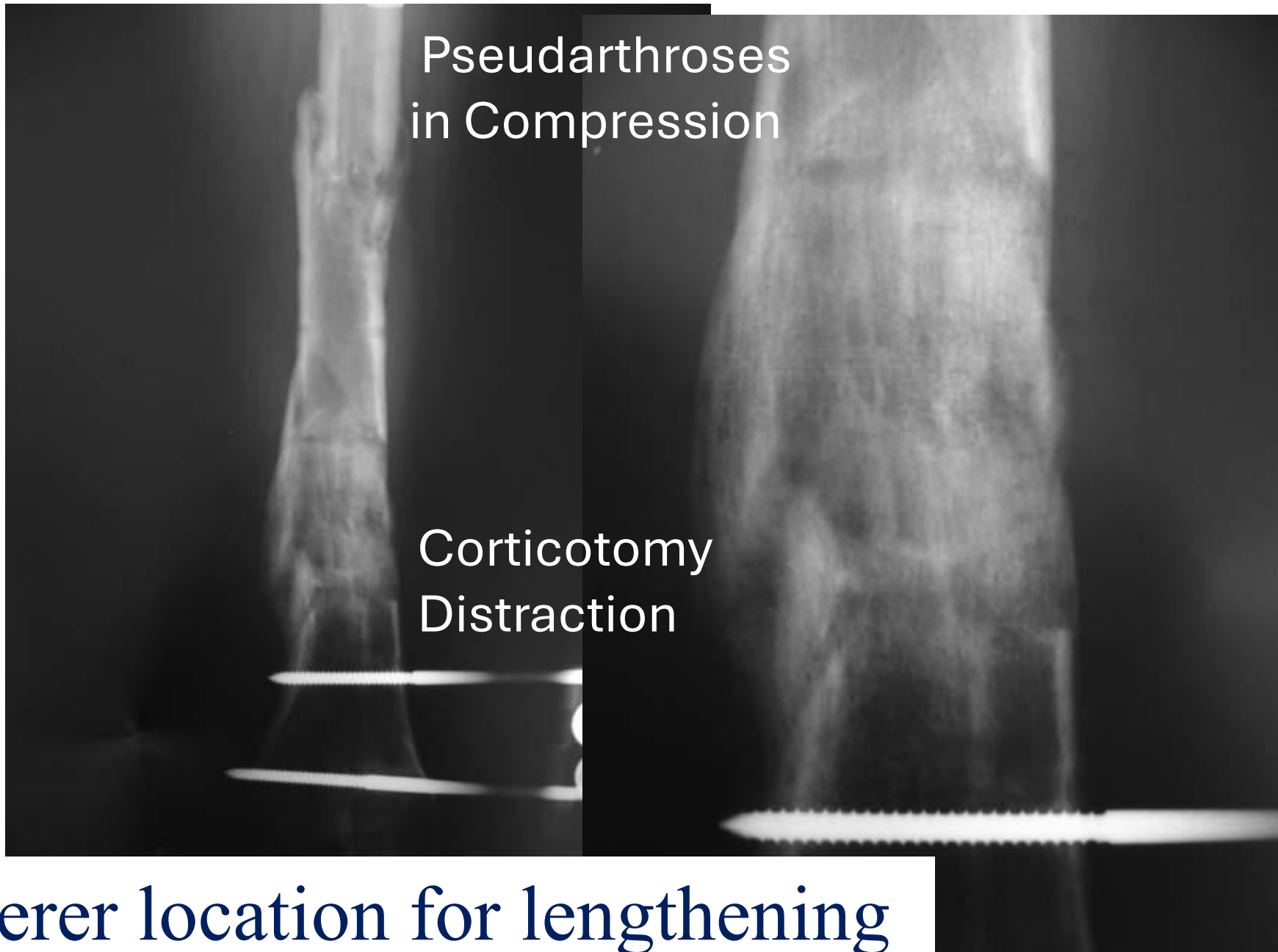


Pseudarthrosis
in Compression



Corticotomy
Distraction





Pseudarthroses
in Compression

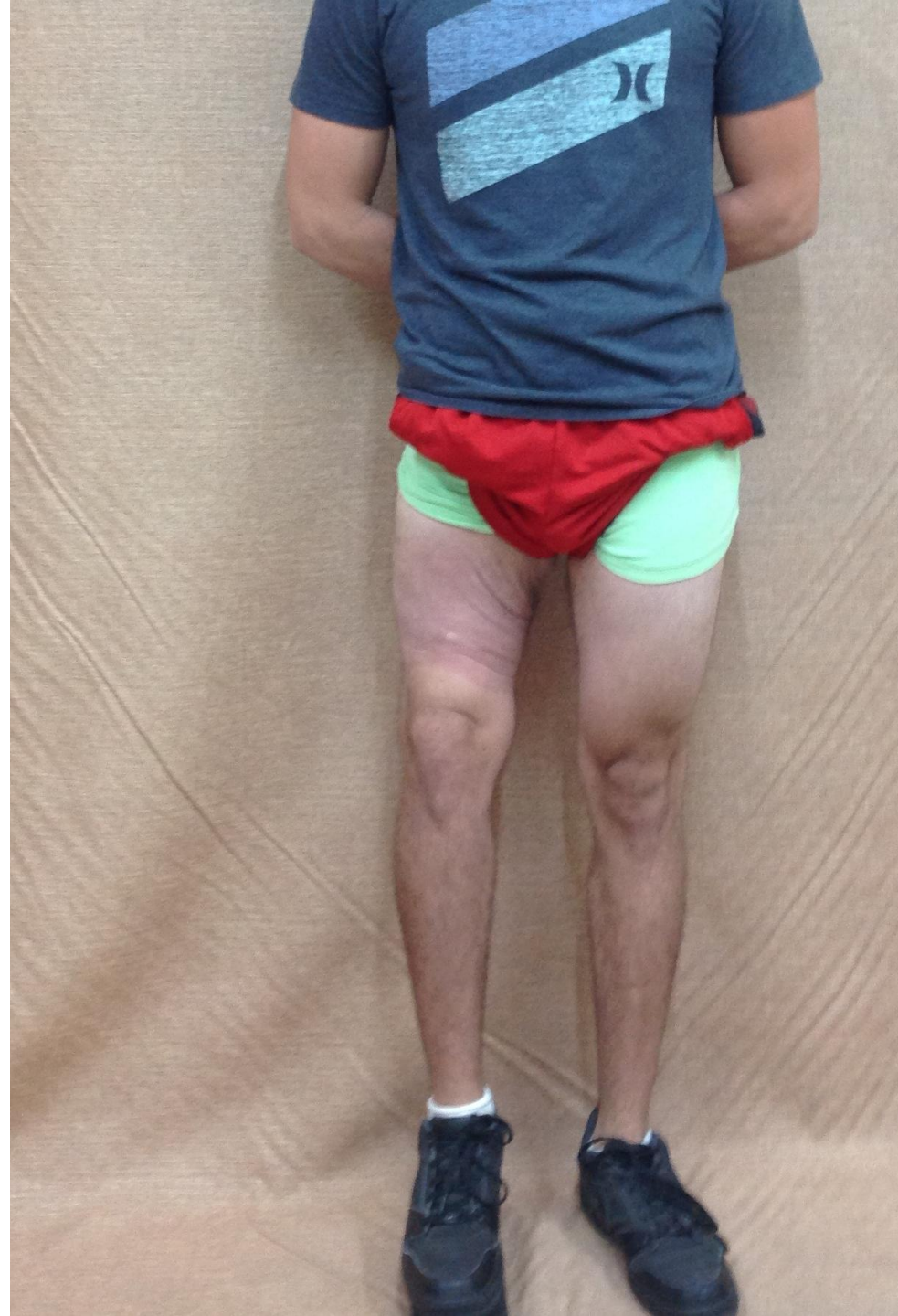
Corticotomy
Distraction

Considerer location for lengthening



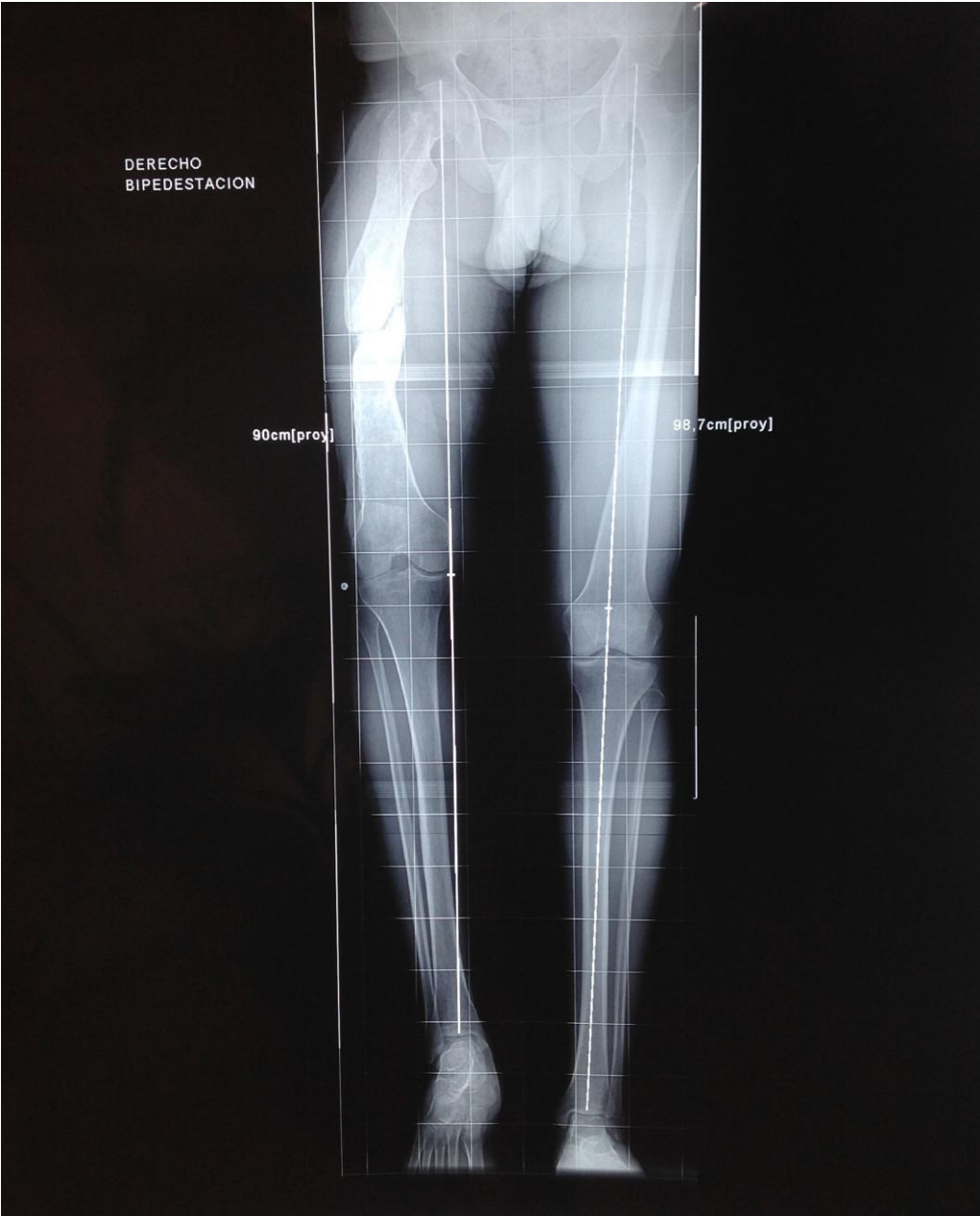
26 year-old-man
Motorcycle accident
7 years Nonunion
11 cms limb length discrepancy

- 26 year-old-man
- Motocross accident
 - Femoral Fracture
 - Pulmonary embolism
- 3 weeks in ICU
- Plate (2011)
 - Plate (2nd) (2011)
 - IMN (2012)
- Osteomyelitis
- External Fixator (2012)
 - External Brace
 - Femoral non-union
- 11 cms shorter
Recurvatum
Varus



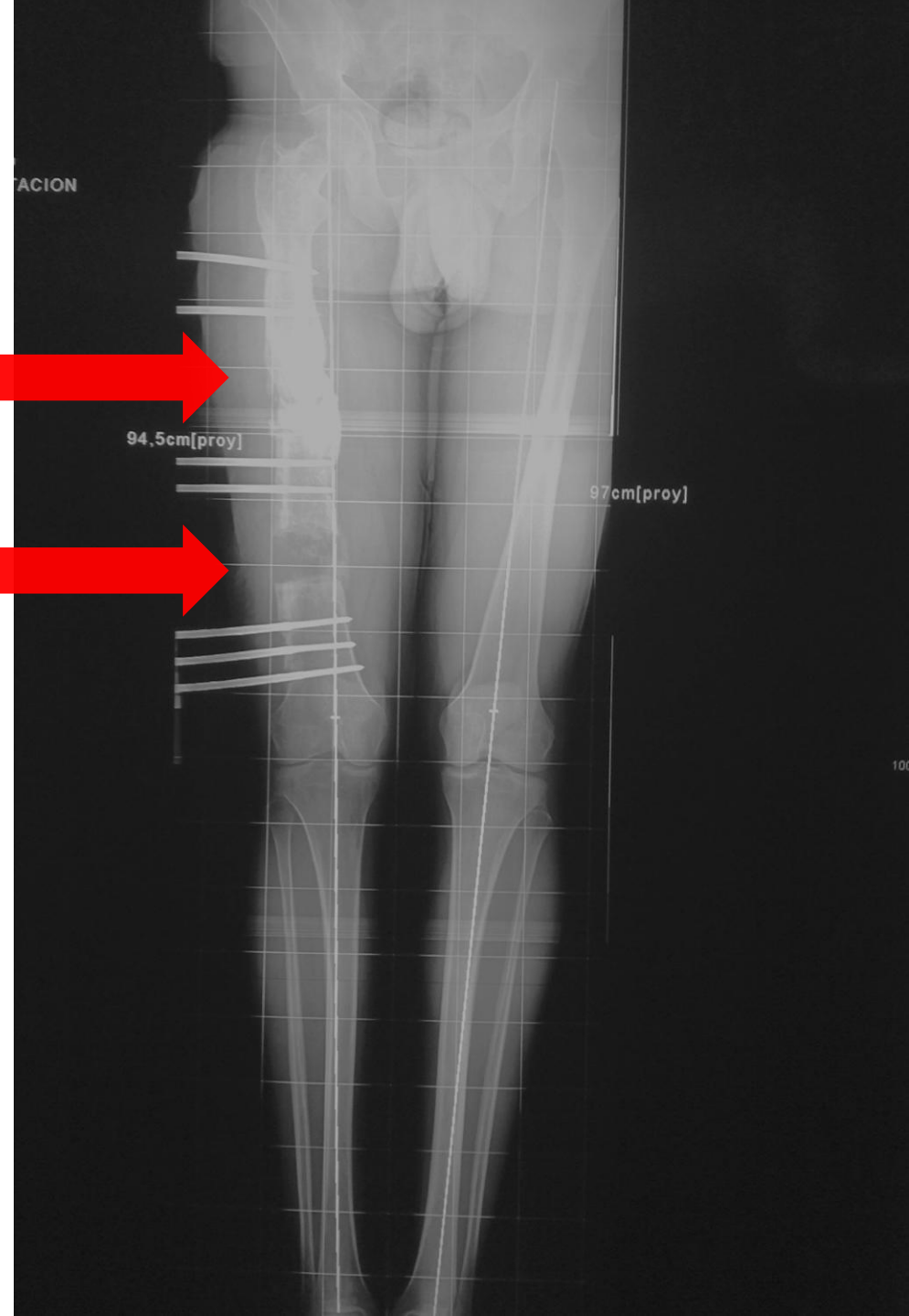


Varus deformity
I.M. nail failed
Infection in plate fixation



Pseudarthroses
in Distraction
Corticotomy
Distraction

Gradual correction of
angulation and mal
rotation of the bone

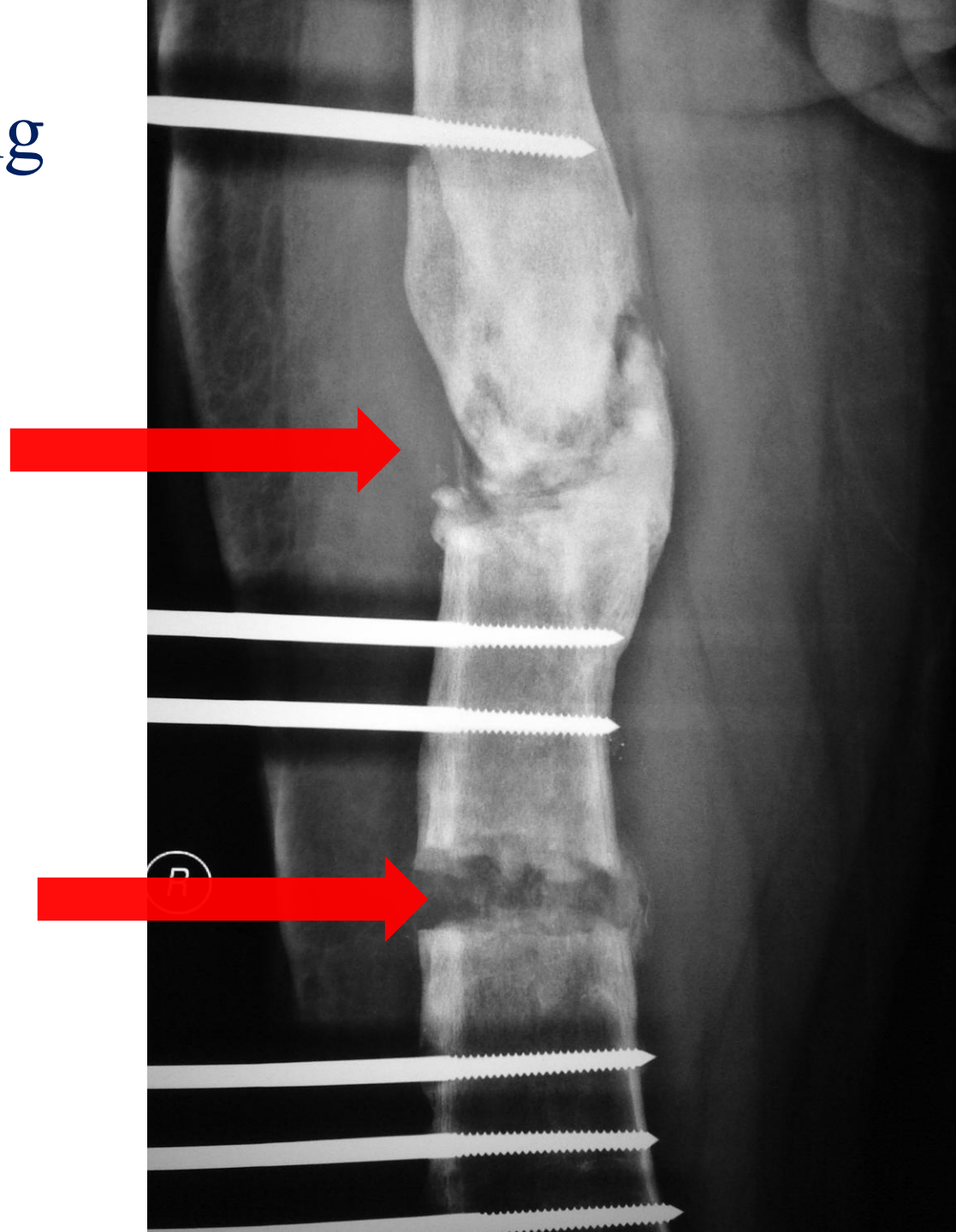


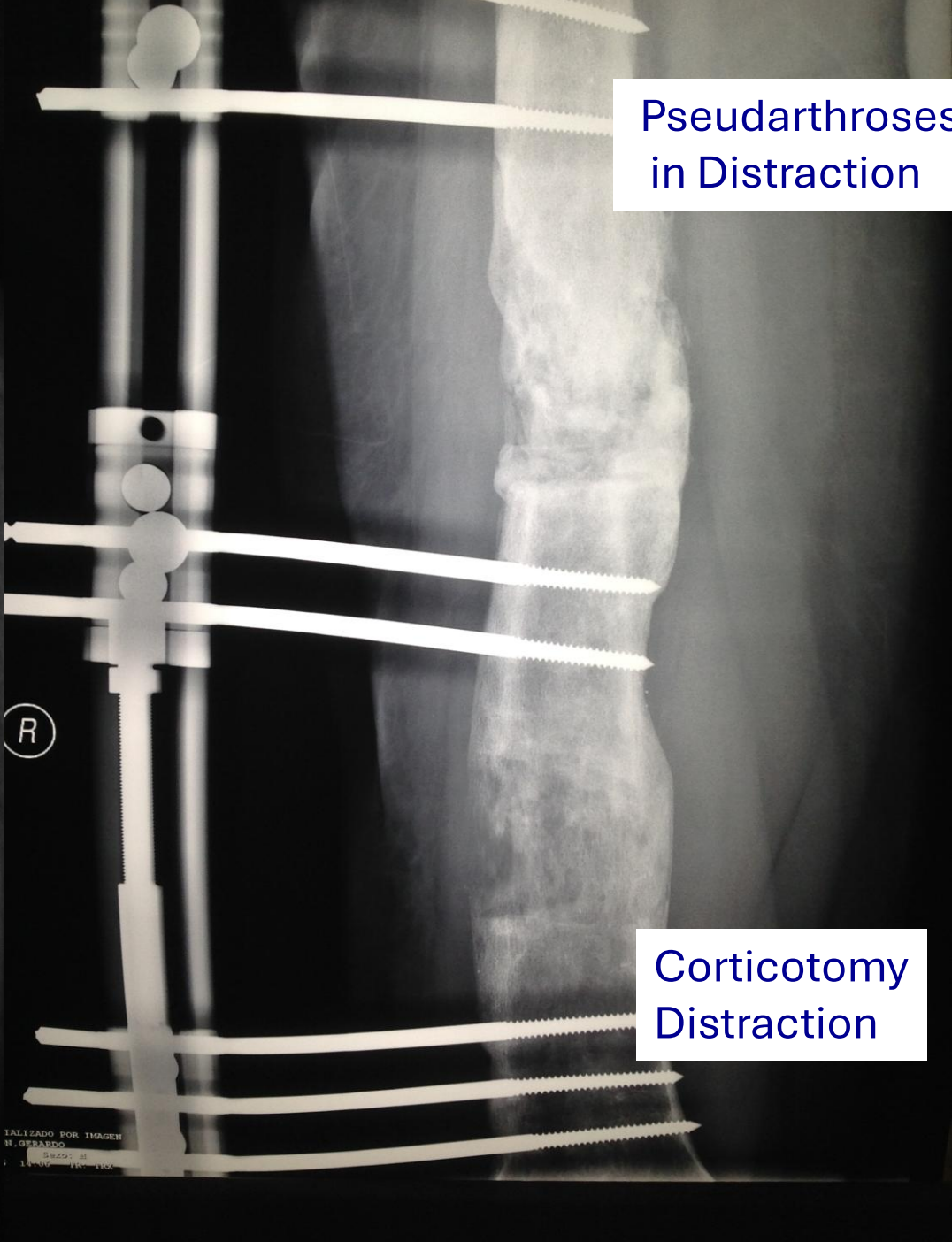


Preoperative planning
2 level corticotomy

Pseudarthroses
in Compression

Corticotomy
Distraction



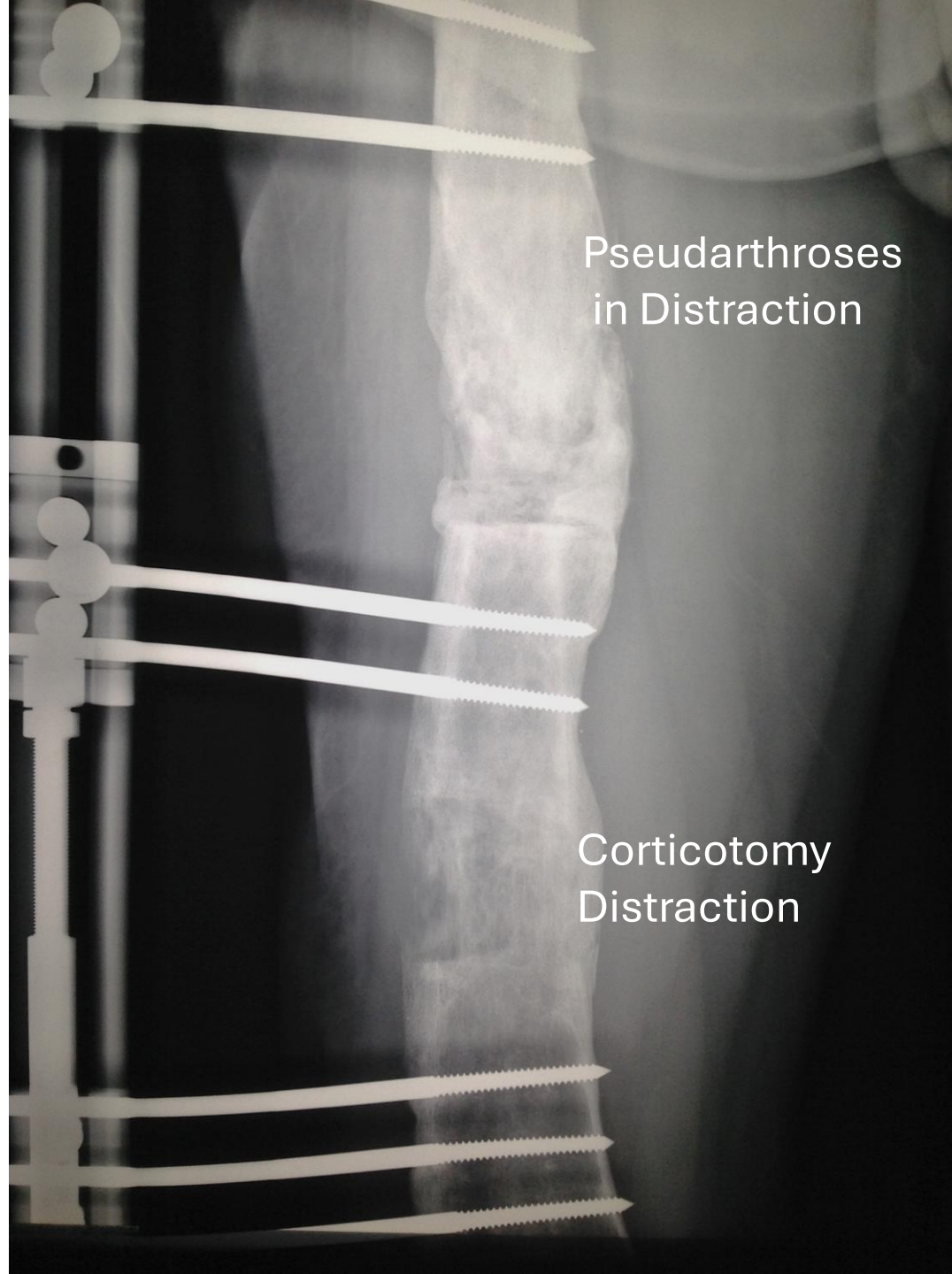


Pseudarthroses
in Distraction

Corticotomy
Distraction

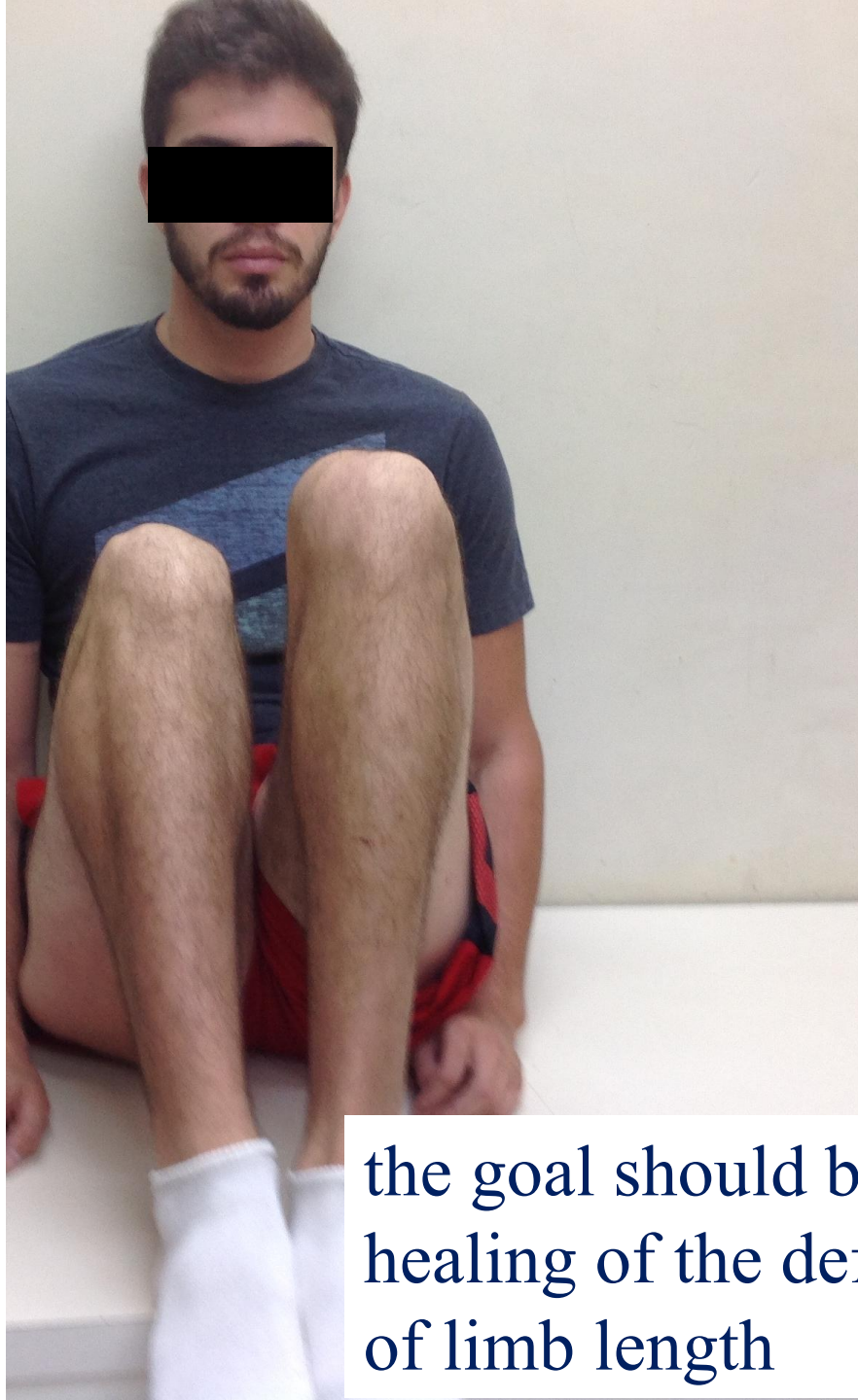
REALIZADO POR IMAGEN
H. GERRARDO
3/20/01
14:00 100 100





Pseudarthroses
in Distraction

Corticotomy
Distraction



the goal should be simultaneous healing of the defect and restoration of limb length

Male patient
28-Year-old-male
Comminuted fracture
Gunshot wound
Open fracture
Treated with Plate





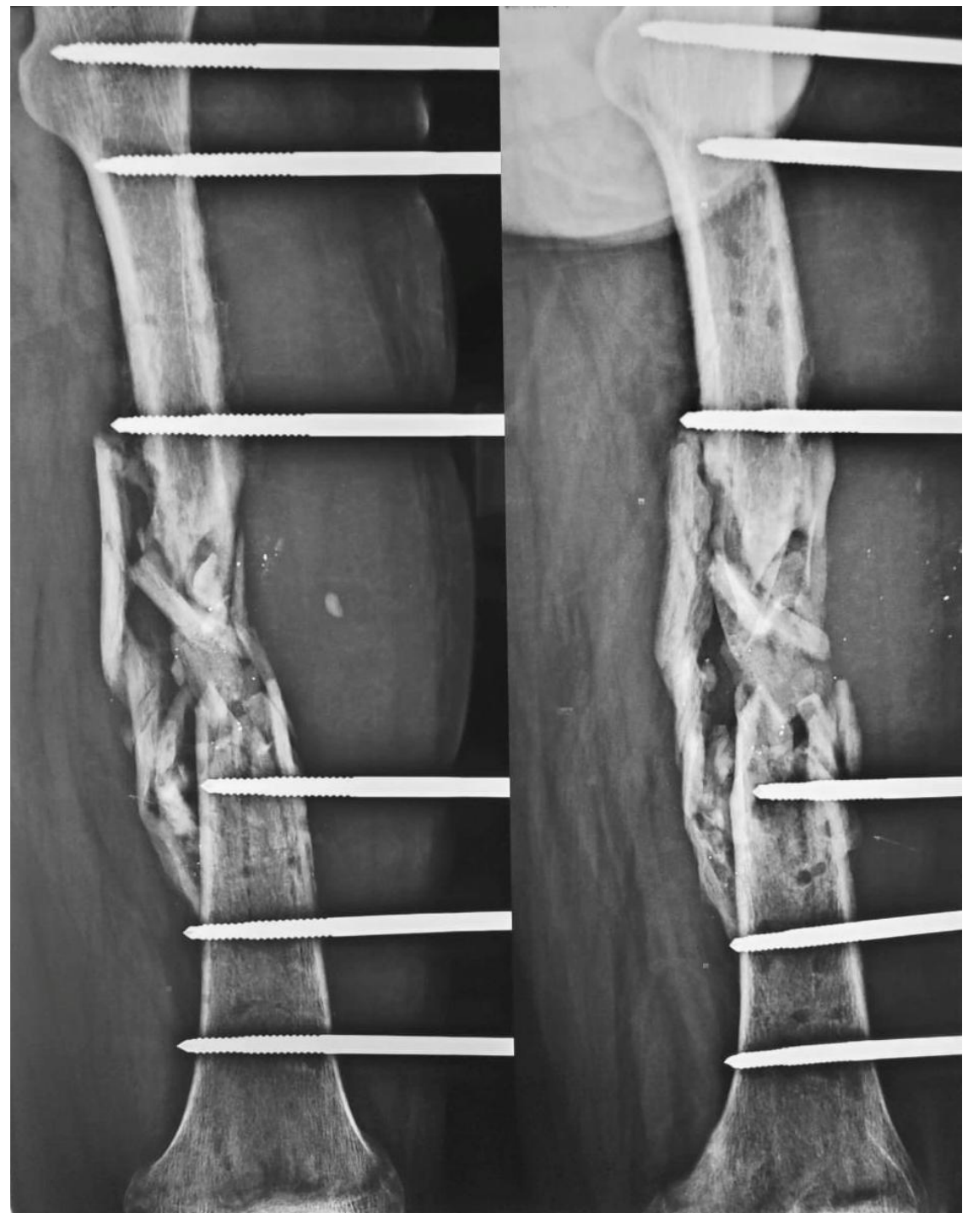
Failed internal fixation
Lost of alignment
and length

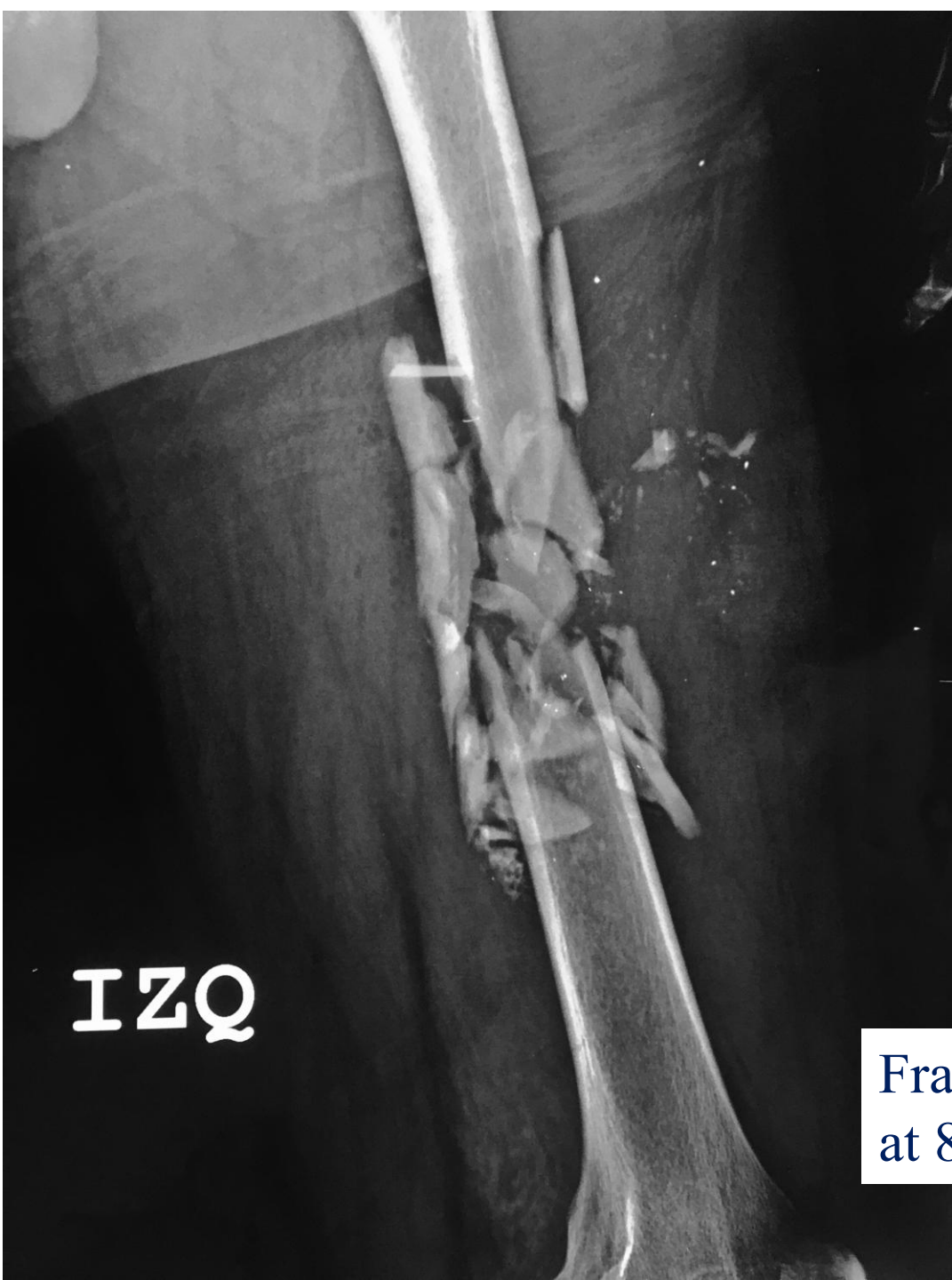
Remove plate
and all screws



Implants were removed
Alignment is restored

External fixation was
applied





IZQ



Fracture is healing
at 8 months

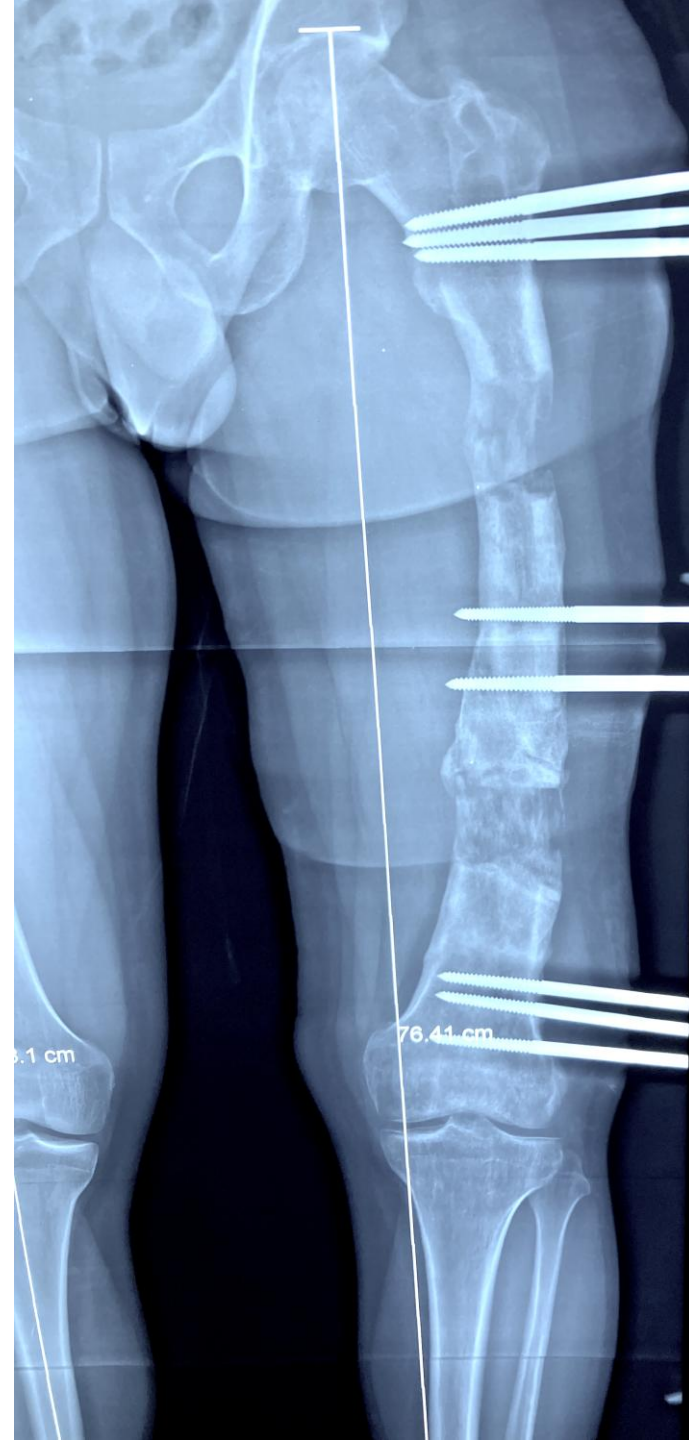


25 year-old-man
Motorcycle accident
With shortening of the
femur 10 cms





The strategy for simultaneous correction



tipo de imagen: ORIGINAL PRIMARY
Número de imagen: 1
Número de serie: 8258
Descripción de la serie: Femur
Fecha de la serie: 2022-11-22

Salud Digna Cancun
Número de acceso: CAN59244...
NIETO GARCIA, RODRIGO
17402388
1989-06-17 :M
2022-11-22
18:54:52



DX

GE Healthcare
Brivo XR118
1944x1310

Ventana/Nivel: 16381/8190

Ampliación calculada: 1.00

Calidad JPEG: 85

Número de imagen: 1
Número de serie: 2296

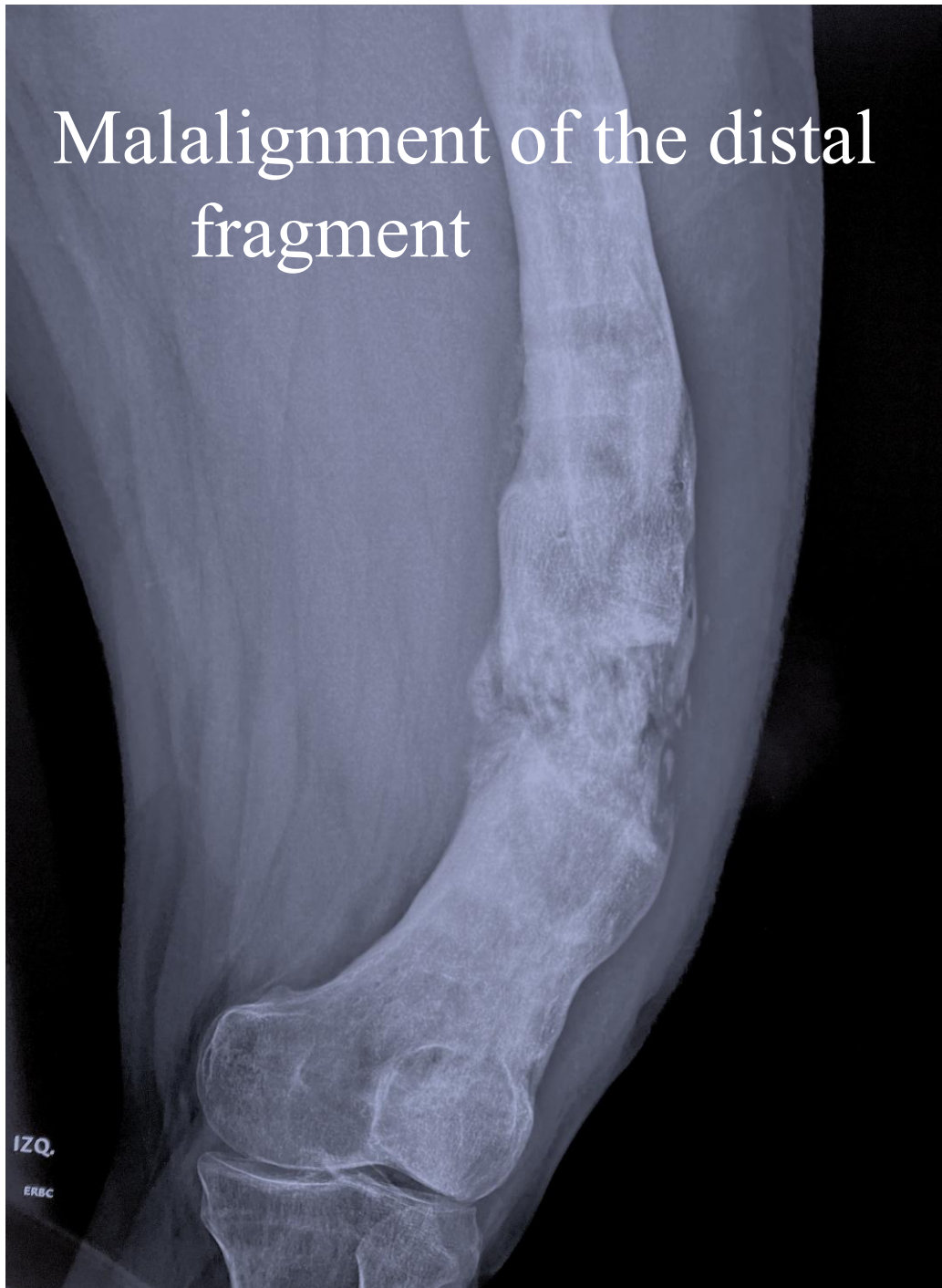


Ventana/Nivel: 16383/8192

Ampliación calculada: 1.00

Calidad JPEG: 80

Malalignment of the distal fragment



IZQ,
ERBC

Corrected



Complications

Wire and pin problems are among the most common complications.



Special care



Clean and protect the pins or screws to prevent infection.

Special care



2 cases : 2 pins removed

Complications

Additionally, there may be permanent loss of range of motion in the nearby joints.



Post-traumatic limb deformities

Summary



Differences in
limb lengths &
deformities

Often require
treatment
at the same time



Take-home Message

Deformities of the long tubular bones are often
Accompanied by limb shortening

We consider correction of the Deformity and
Limb lengthening, simultaneously

Thanks