# Extra-Articular Deformity Including Post HTO


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**Advanced course in Total Knee Replacement**
**TKR in Deformities And Contractures**

**EFORT Vienna 2017**

Sagittal plane

?

Axial plane

?

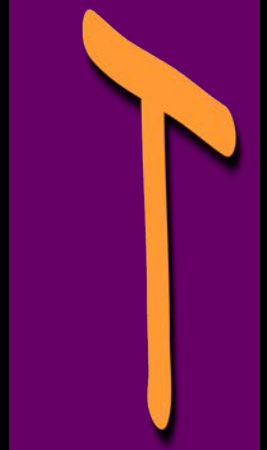
Frontal plane

Step by step
3D Assessment of the deformity

Knee joint

frontal

Knee joint



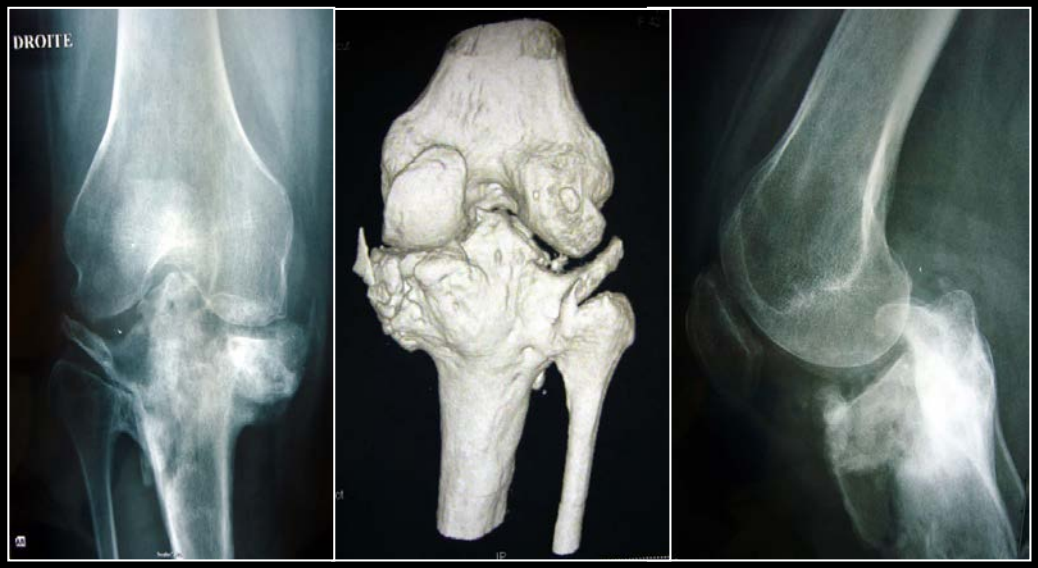
Sagittal

Knee joint

Horizontal

# Intra-articular deformity

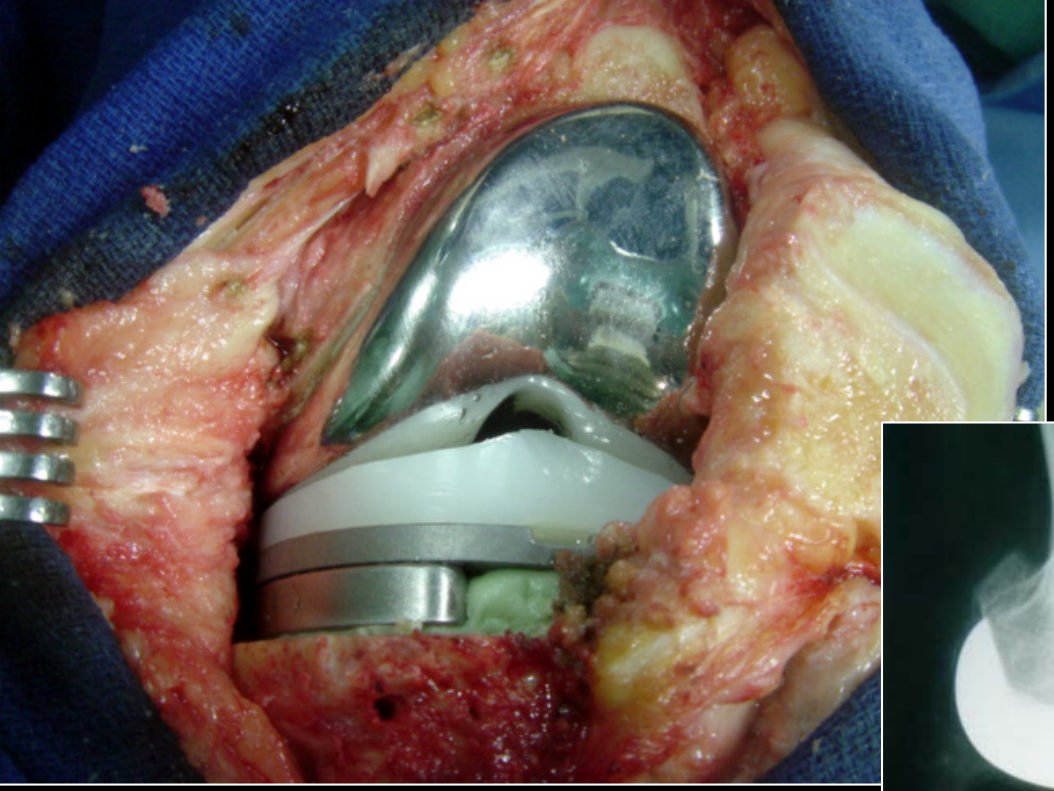
# Knee joint




The deformity is easily addressed by alterations in the orientation and location of bone resection.
Long stem and metal augments…

Knee joint

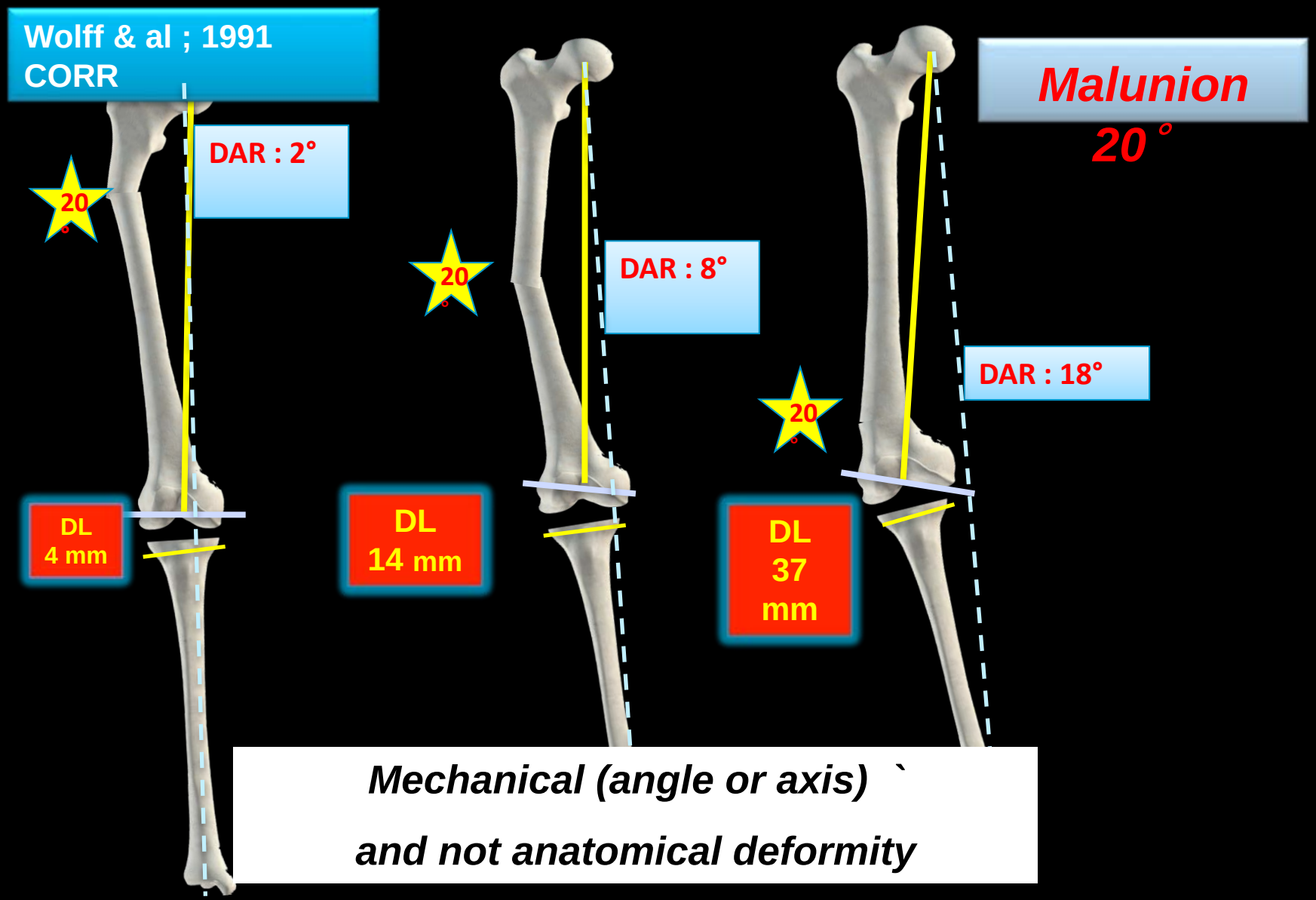

HKA 165°



# VALGUS

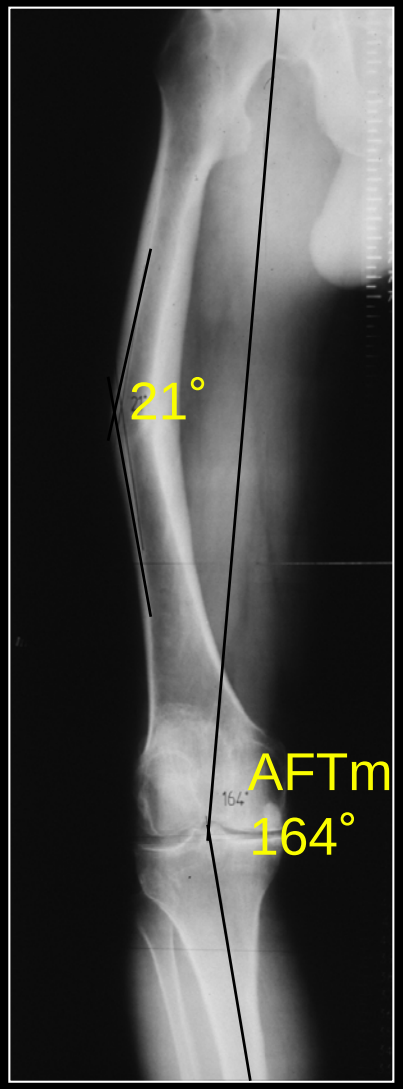

# Extra-articular deformity

# Frontal plane




*Mechanical (angle or axis) `*

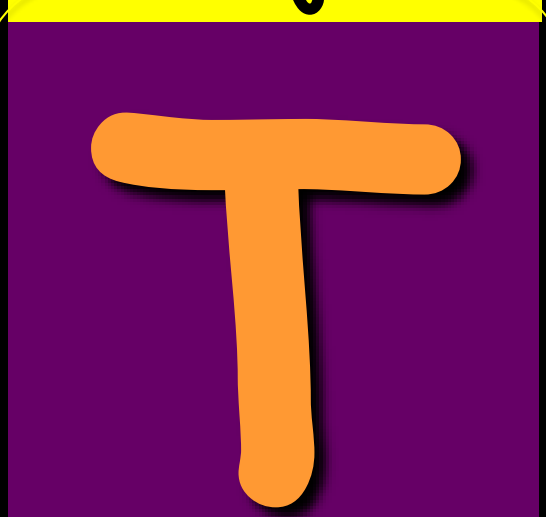
*and not anatomical deformity*



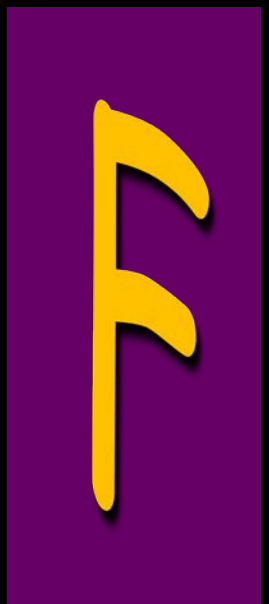

Midshaft malunion ***21°*** :

Knee varus extraraticular deformity: ***10.1°***
(wear ≈ 6° )

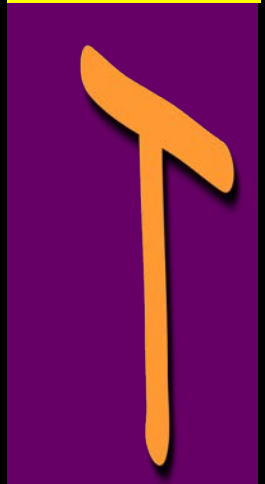
Knee joint



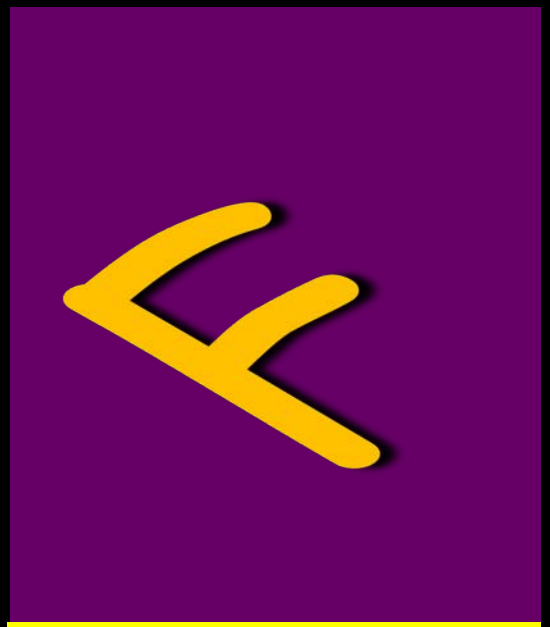
frontal



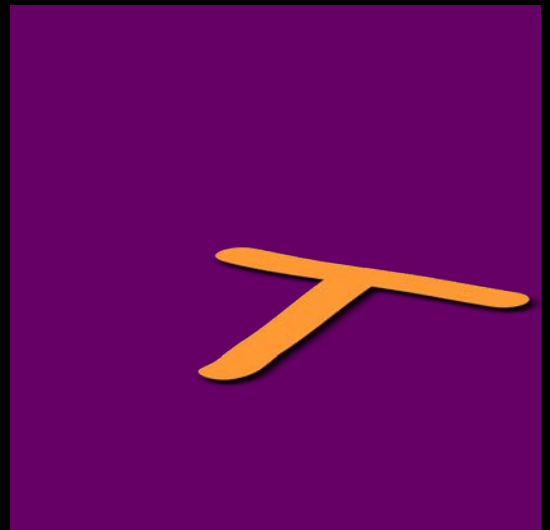
Knee joint



Sagittal



Knee joint

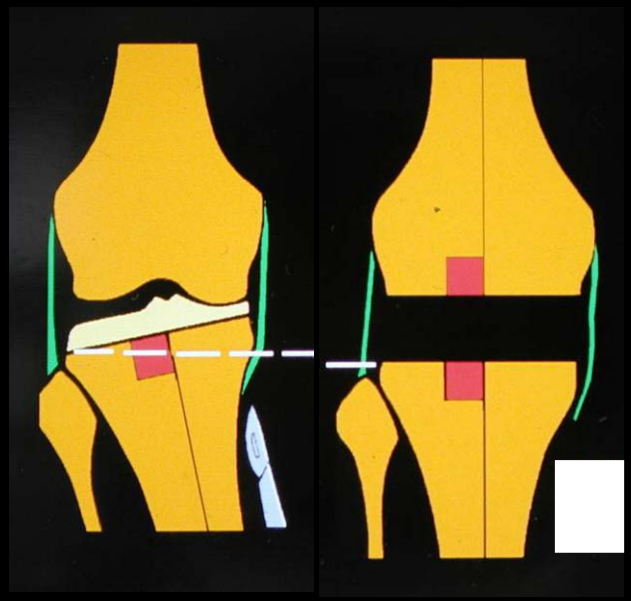


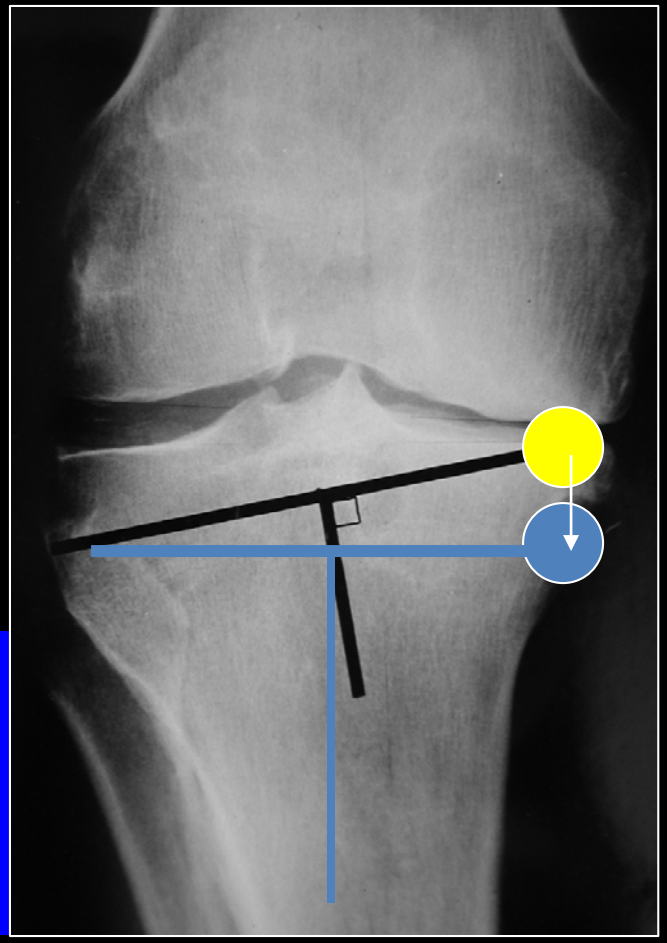
Horizontal

# Tibial Malunion: Varus Deformity

Mr De M…


# Tibia: Varus Deformity

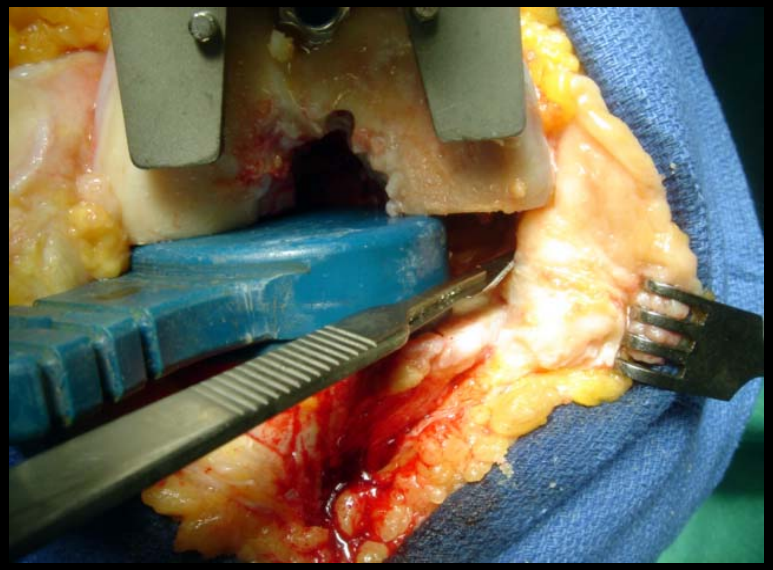


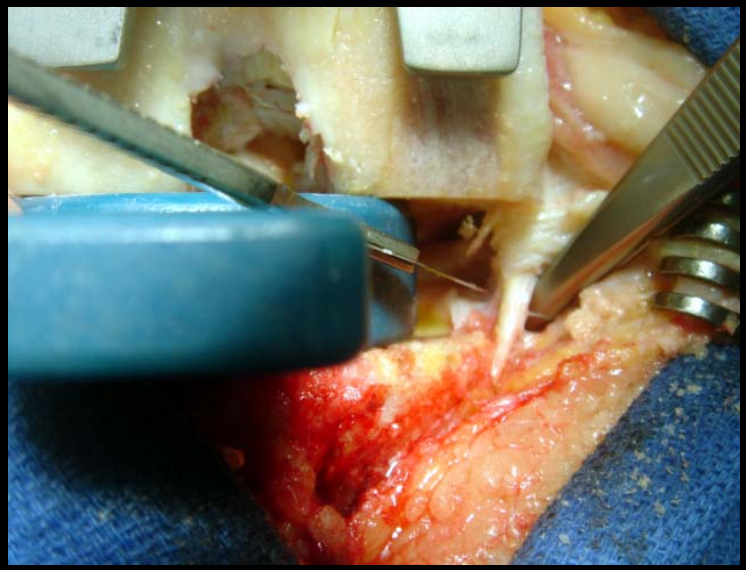


**“LAXITY”**
**due to Asymmetrical cut**

# OPTION 1

- Pie Crust of the superficial MCL at the joint line level. Only the tightest fibres of the MCL are adressed from the inside in flexion (anterior) and in extension (posterior) using an 11 blade

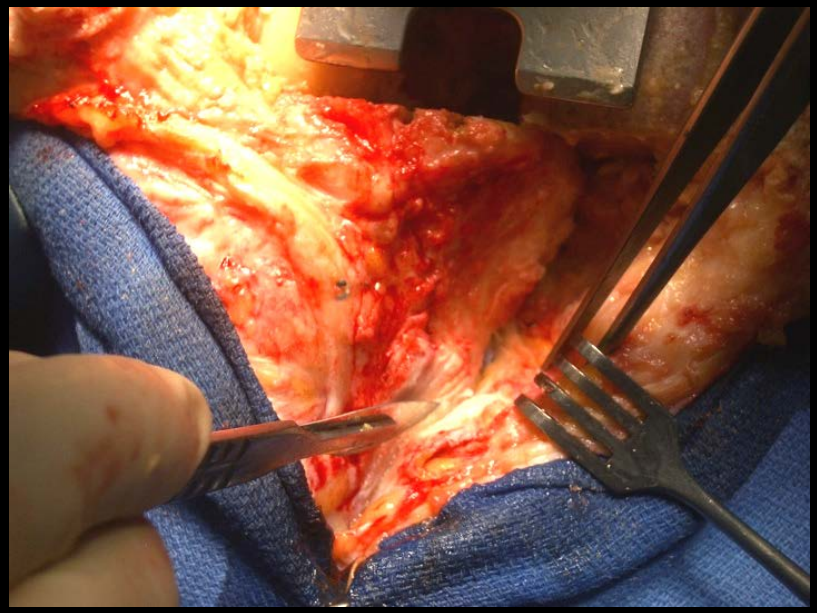




For moderate varus knees

# OPTION 2

- Release of the superficial MCL on the distal tibia + release Semi-Membranosus



For <u>severe</u> varus knees

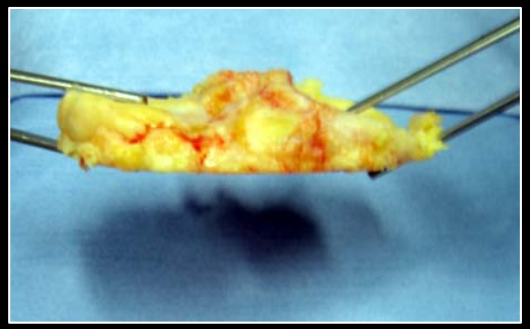
International Orthopaedics (SICOT)
DOI 10.1007/s00264-014-2420-0

ORIGINAL PAPER

# Results and complications of single-stage total knee arthroplasty and high tibial osteotomy

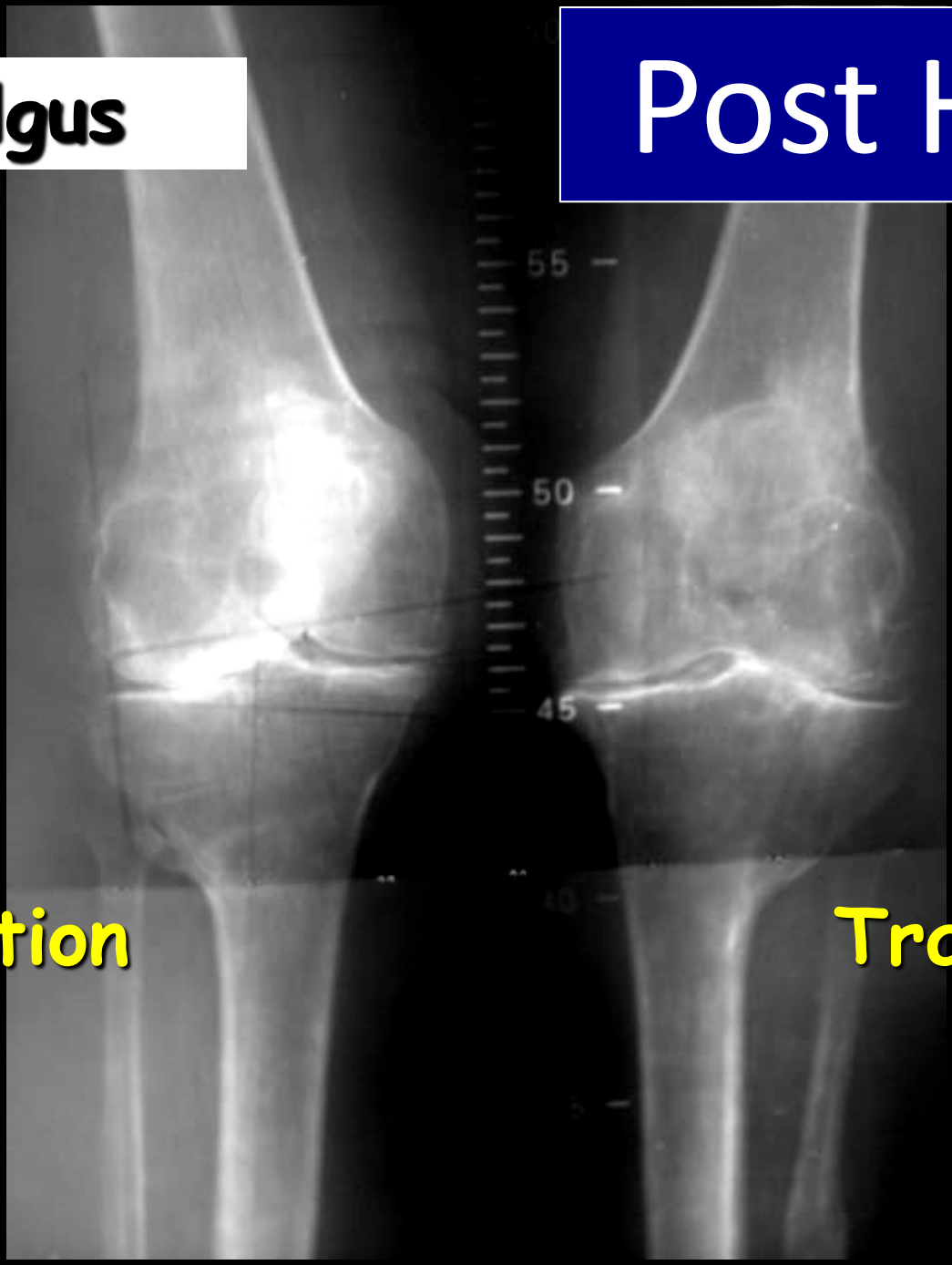
Anya Madelaine · Vincent Villa · Christian Yela · Timothy Lording · Sebastien Lustig · Elvire Servien · Philippe Neyret

# OPTION 3



Valgus

# Post HTO

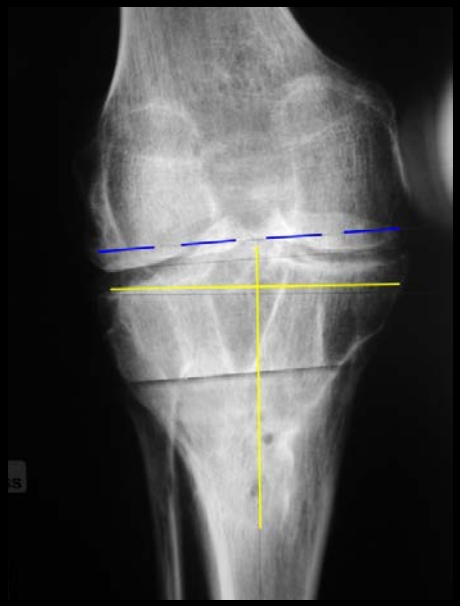


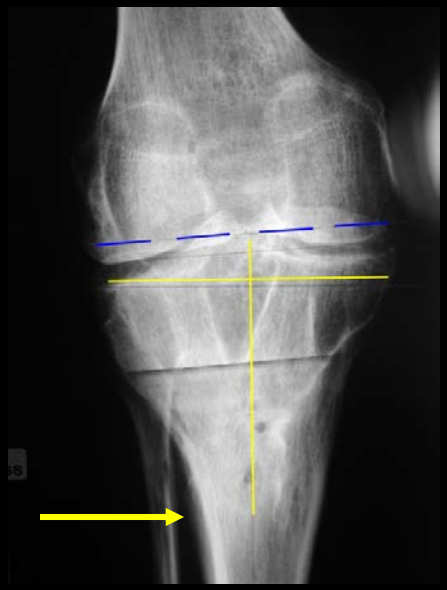

Angulation

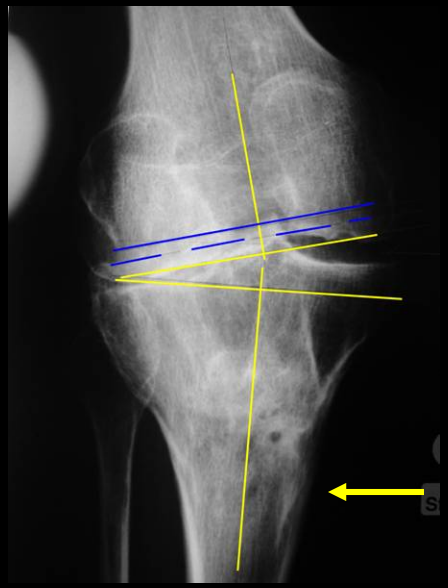
Translation

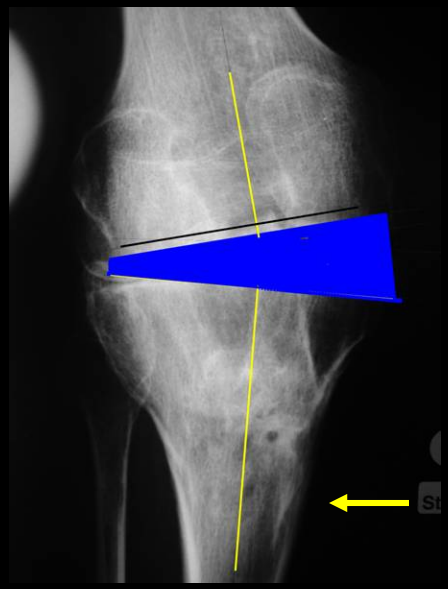
# Angulation

# Tibial Malunion Valgus Deformity



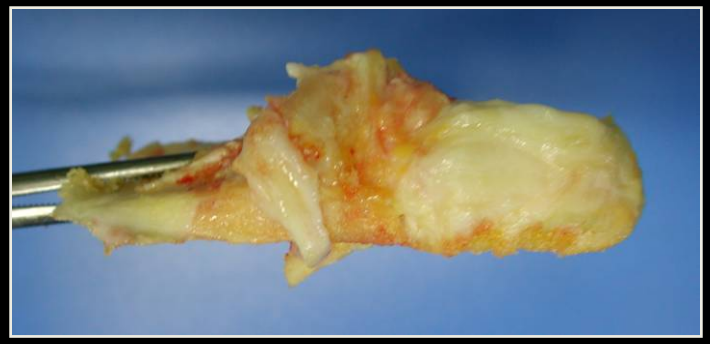


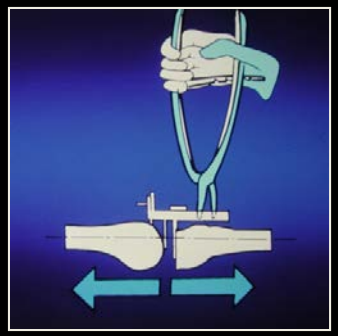


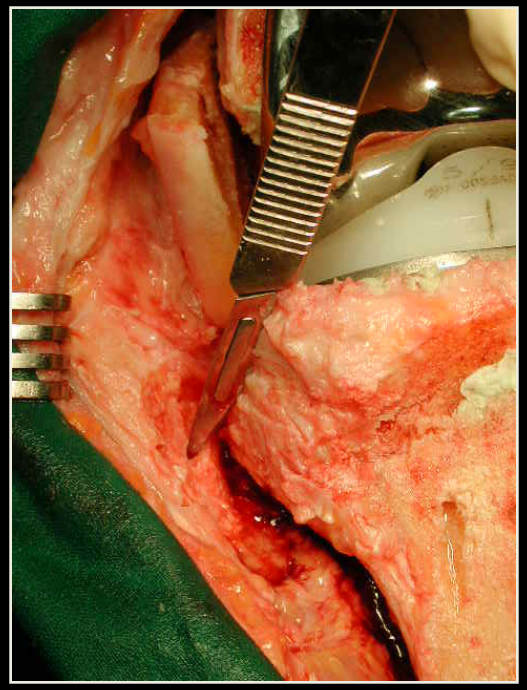


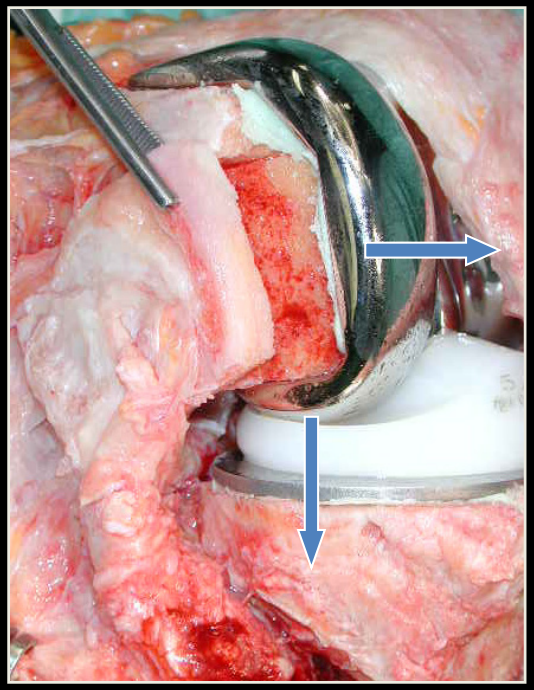
# Angulation

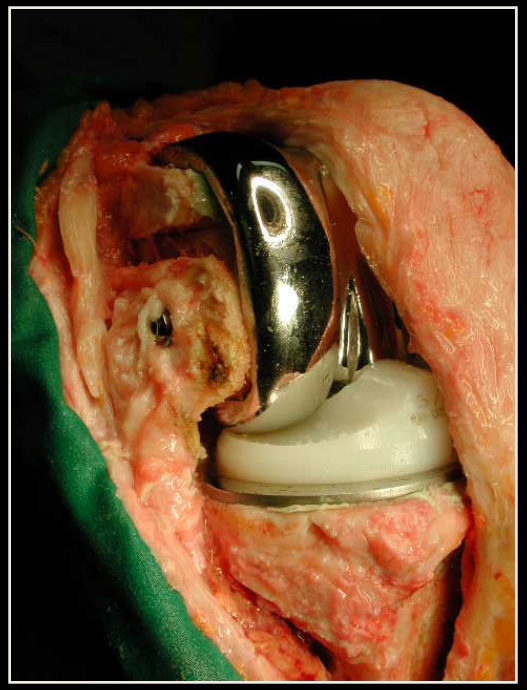
# Tibial Malunion Valgus Deformity





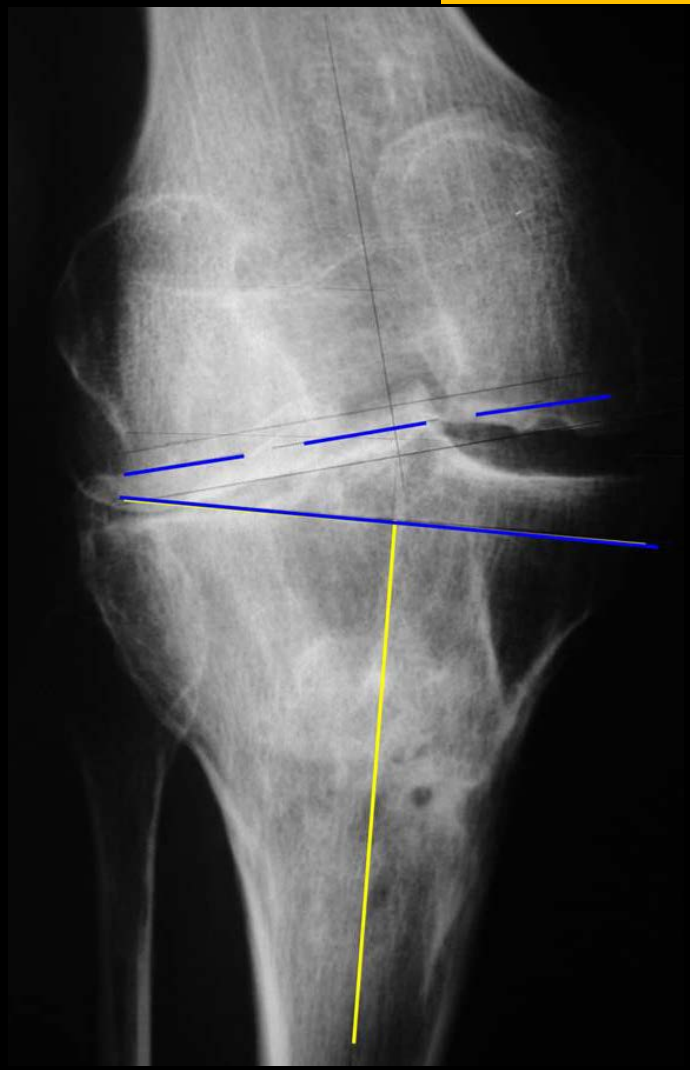


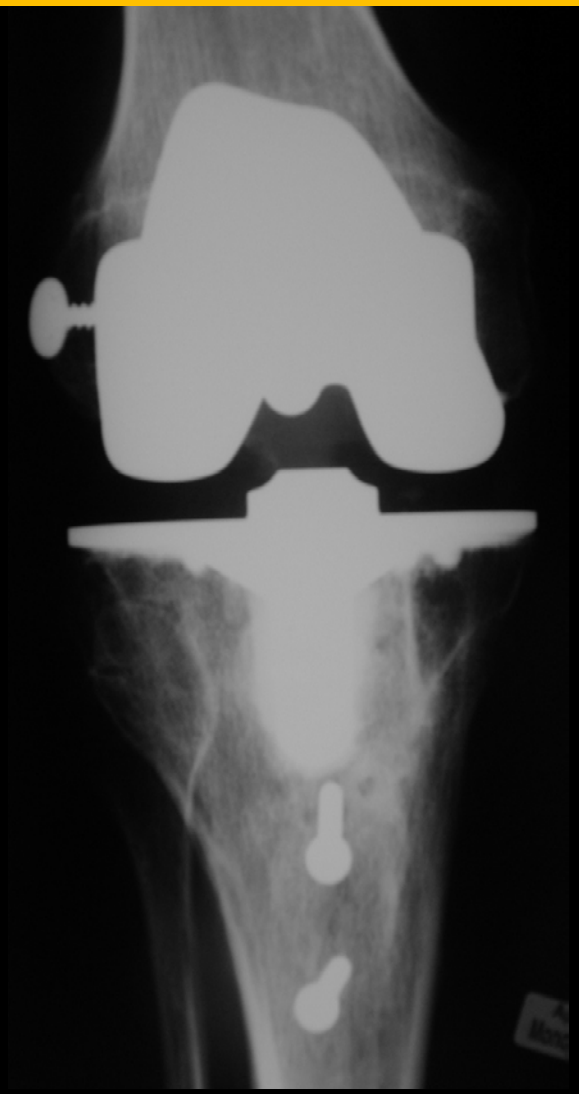




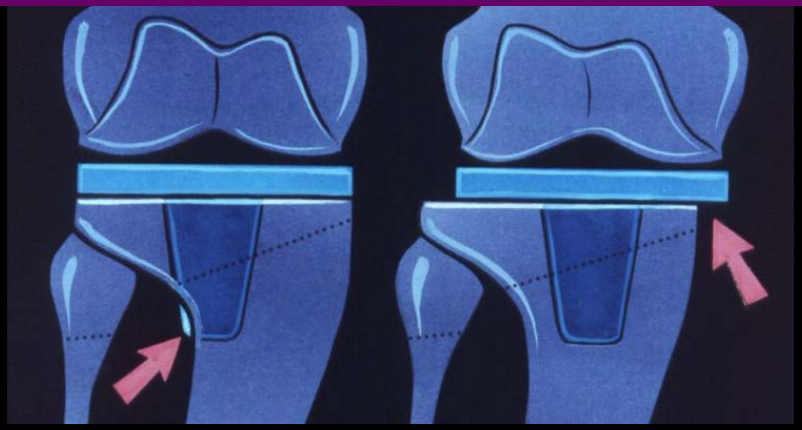
# Angulation

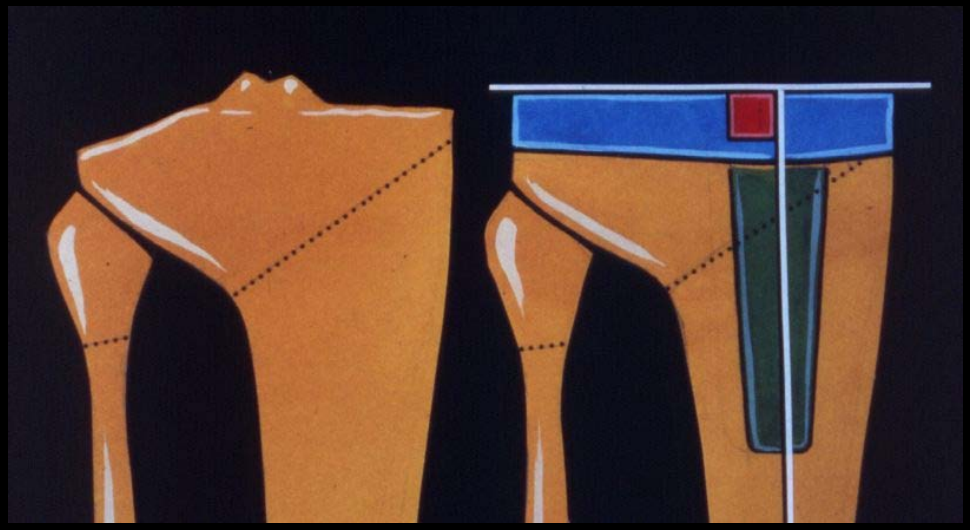
# Tibial Malunion Valgus Deformity

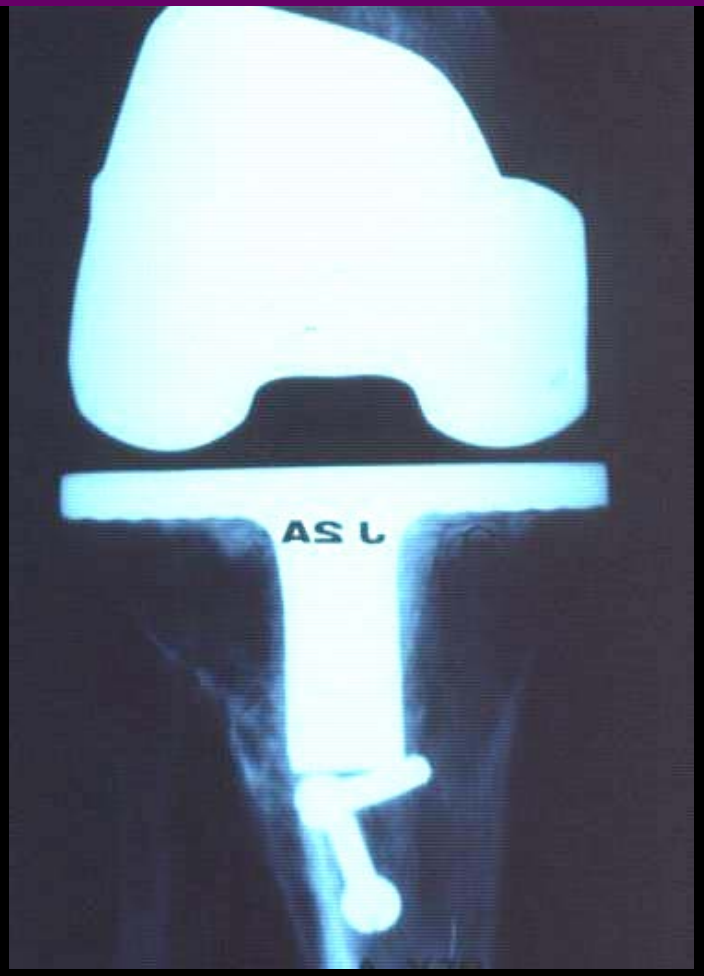




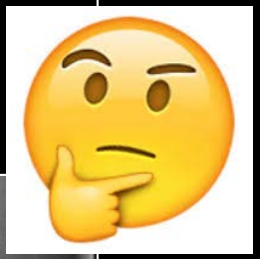
# •Tibial malunion: Translation



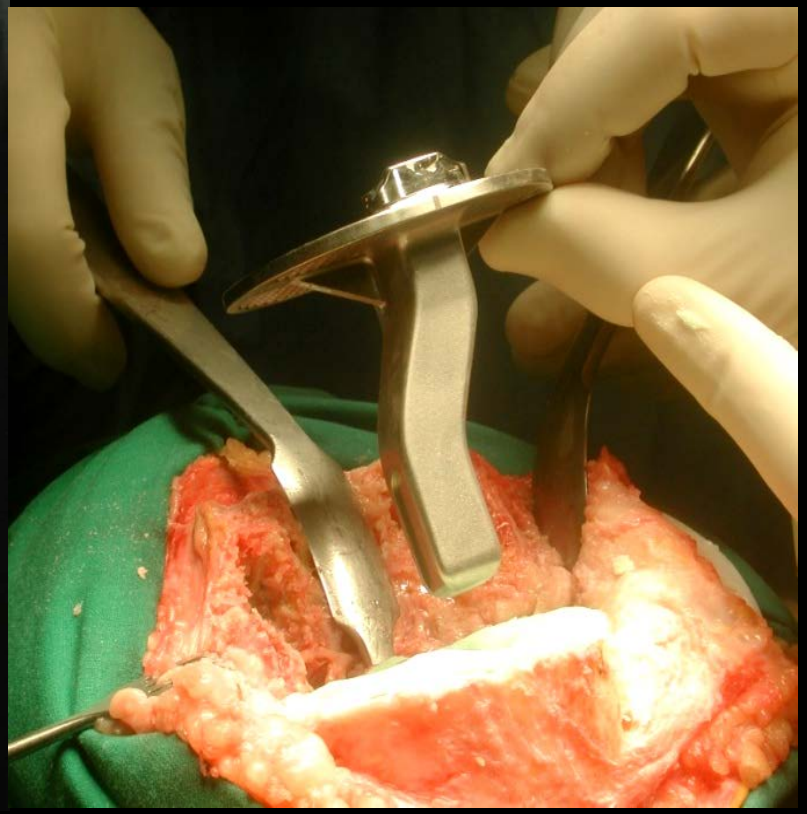





D

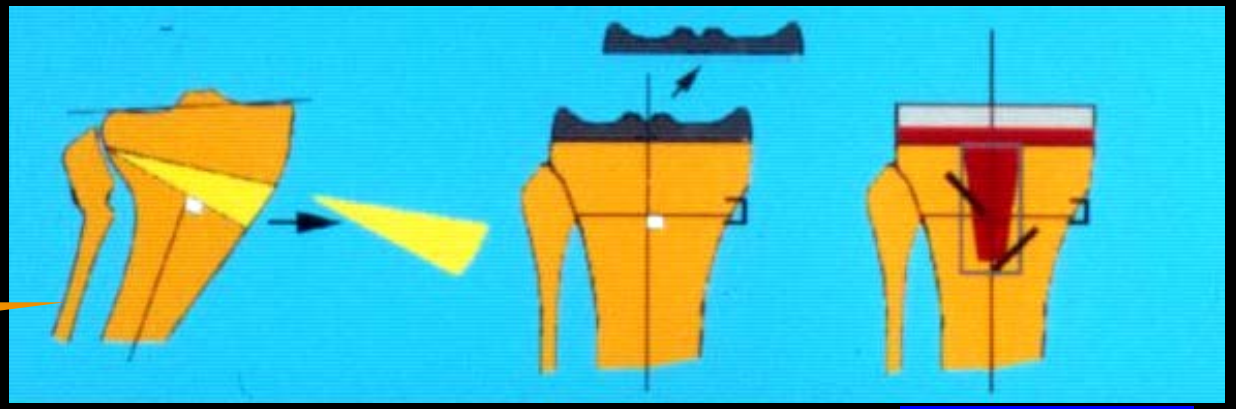


# •Tibial malunion: Translation

# Discussion

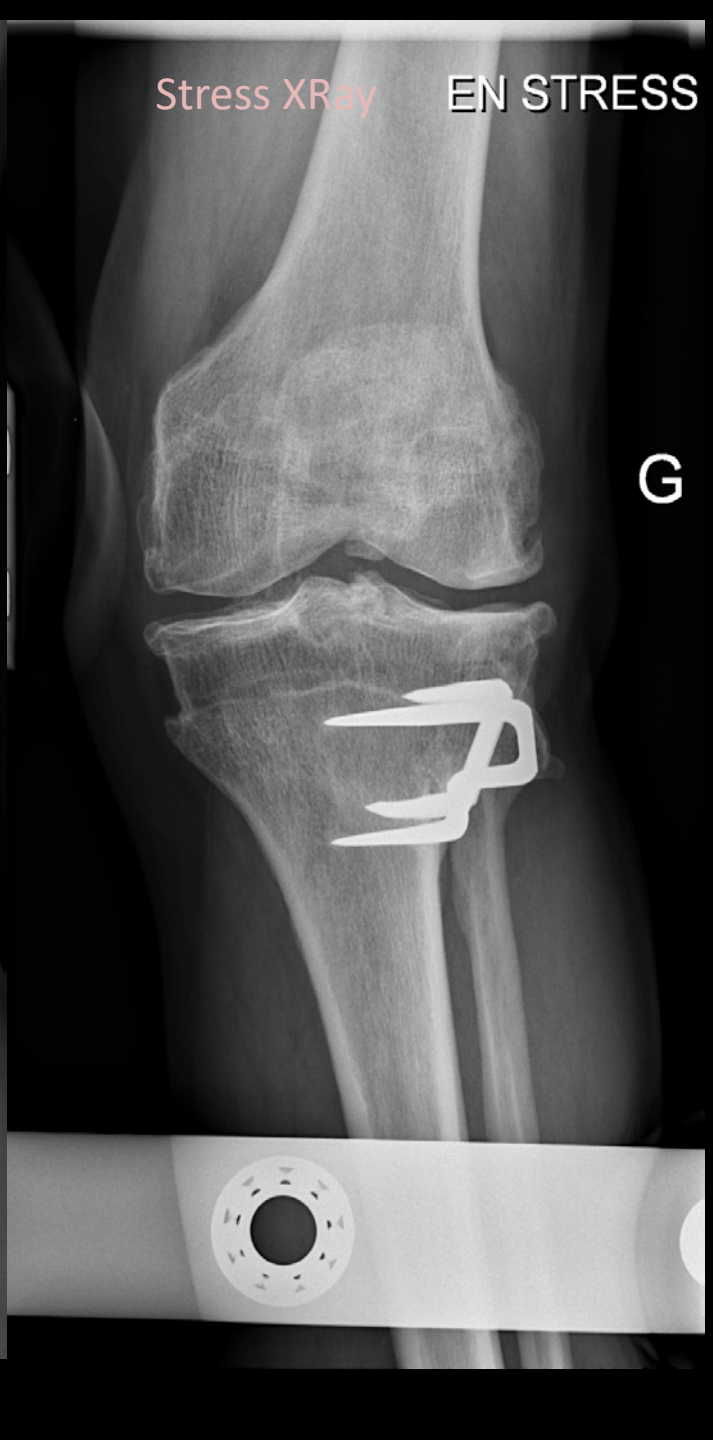
- Stem impingement, major deformity…



Simultaneous osteotomy ??

??


Monopodal stance
G

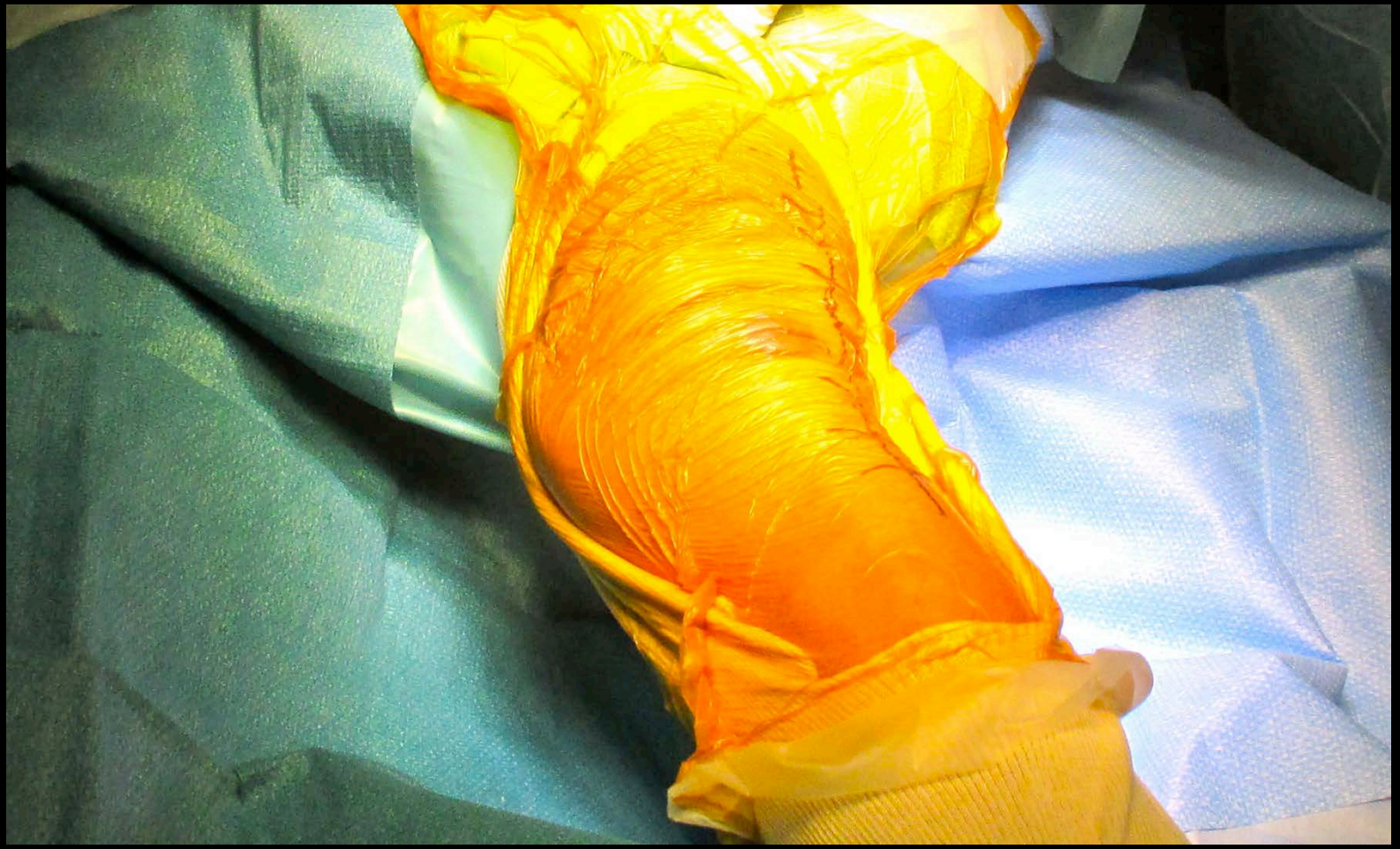

Stress XRay
EN STRESS
G


Lat View
G

- HKA : 197°

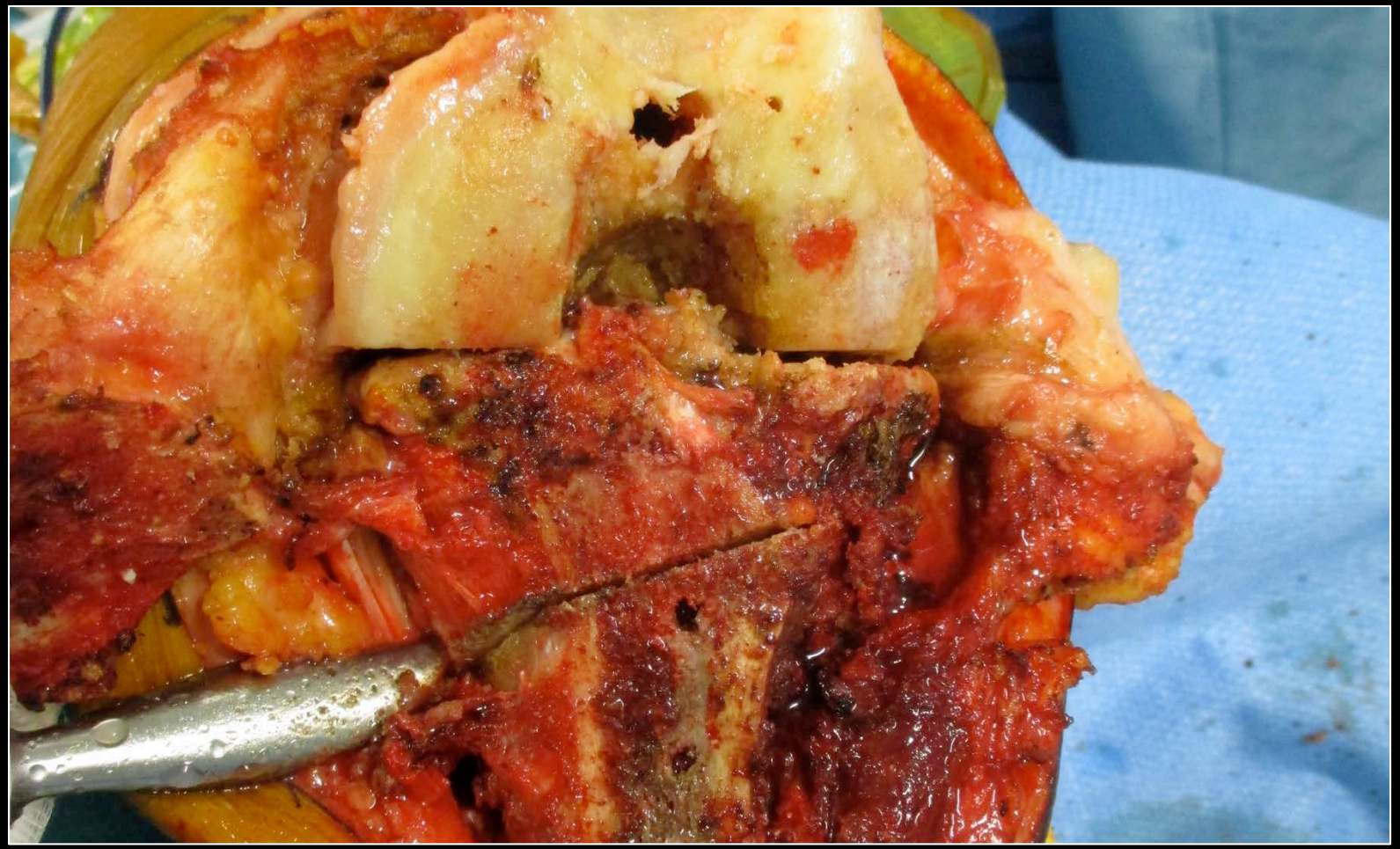
(ie 17° of valgus)

- FMA : 94°
- TMA : 96°
- HKS : 7°

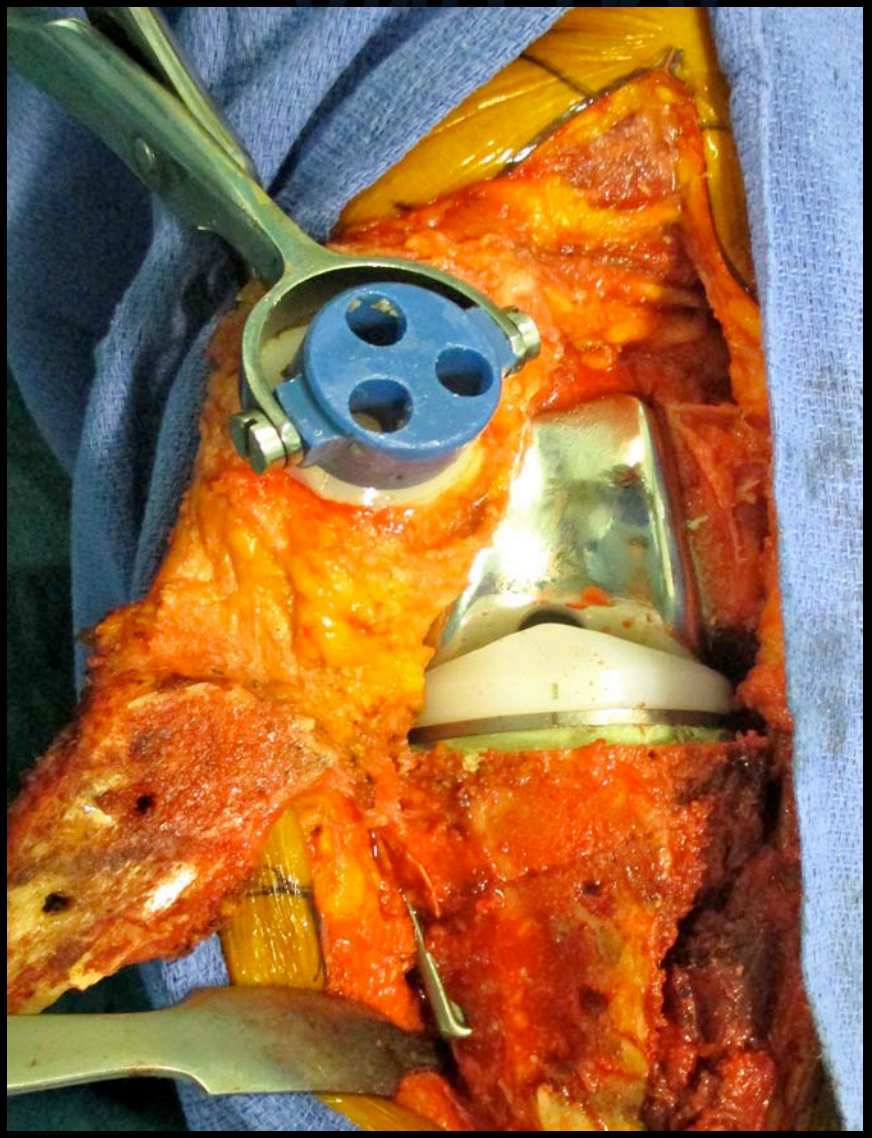


# LAT APPROACH ATT ELEVATION

# MEDIAL CLOSED WEDGE HTO

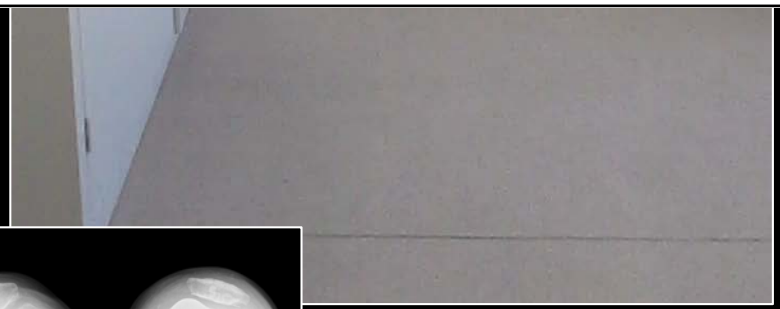


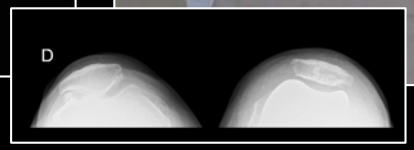
# ...AND TKA




G


G




D

# Type of Tibial Malunion

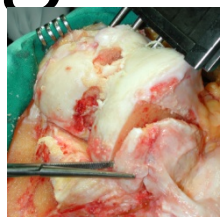
## Translation

Custom made stem

or

combined tibial osteotomy

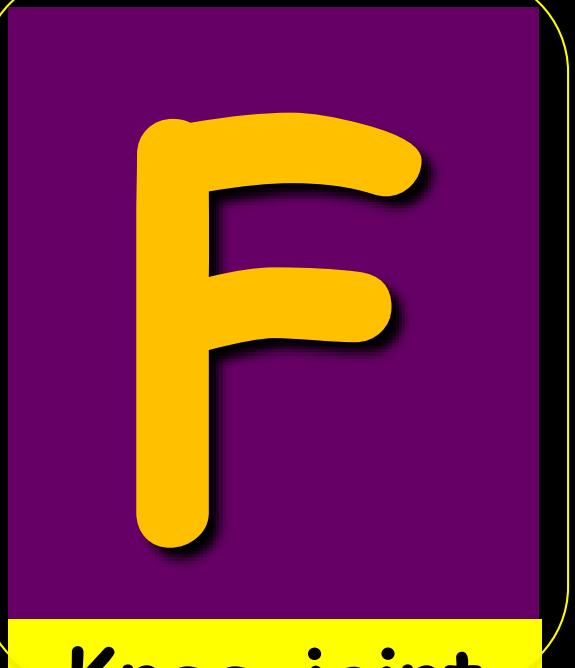
## Angulation



Condylar osteotomy

or

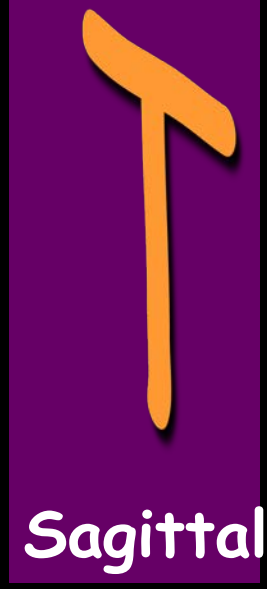
combined tibial osteotomy



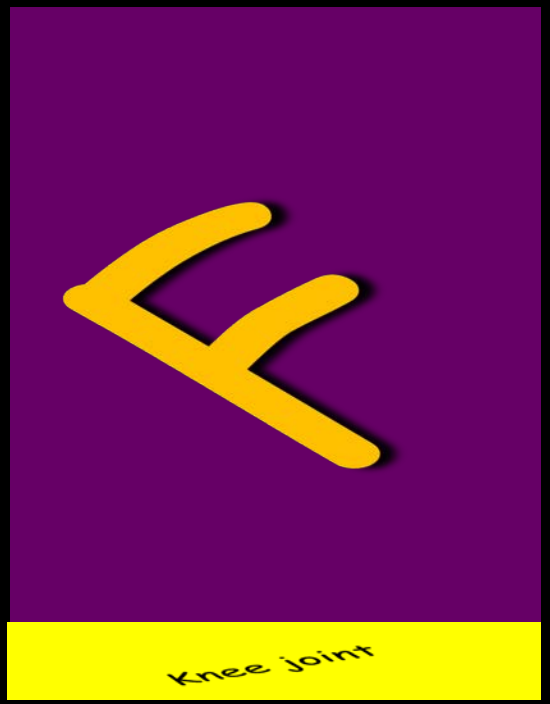
Knee joint

frontal

Knee joint



Sagittal

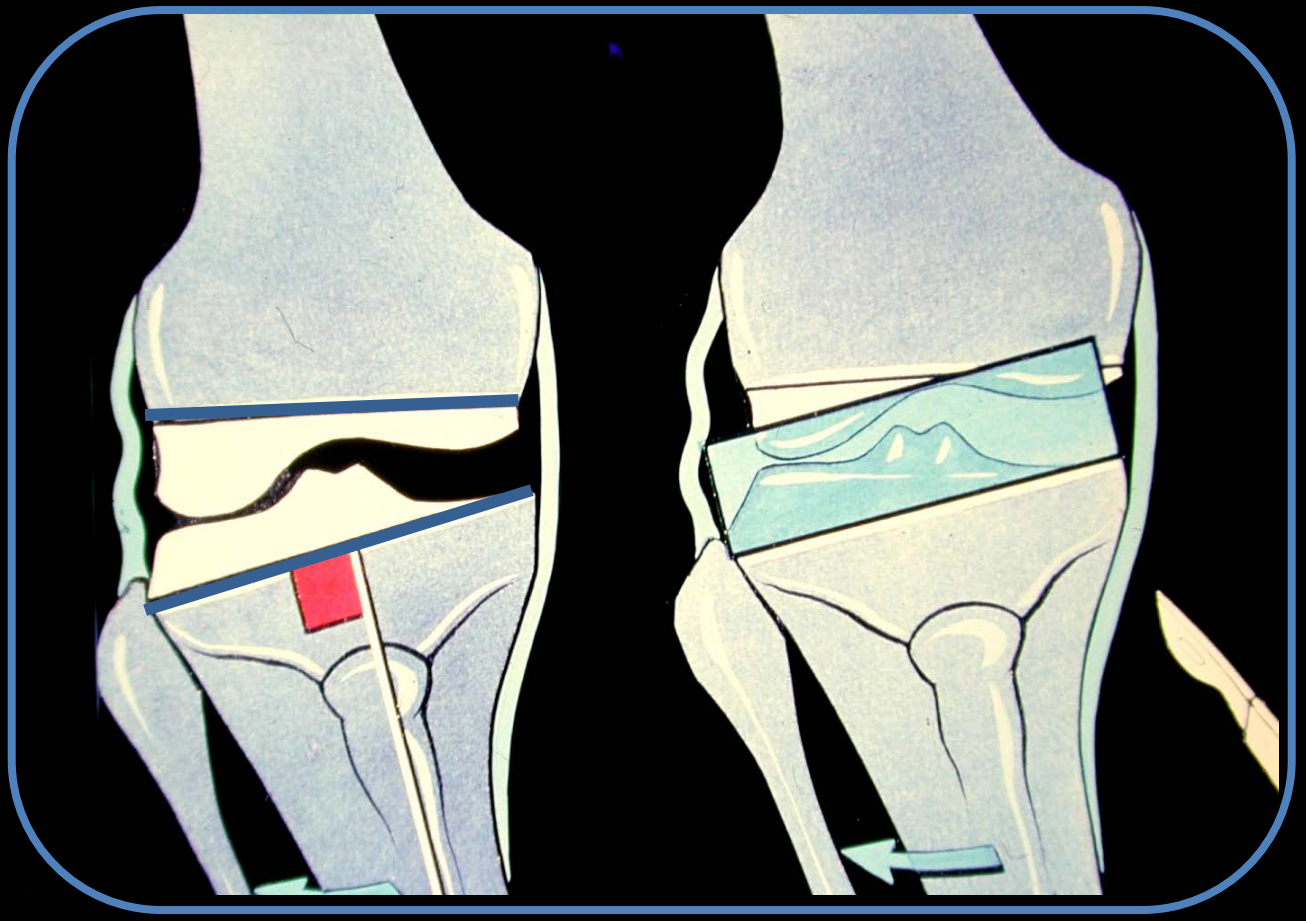


Knee joint

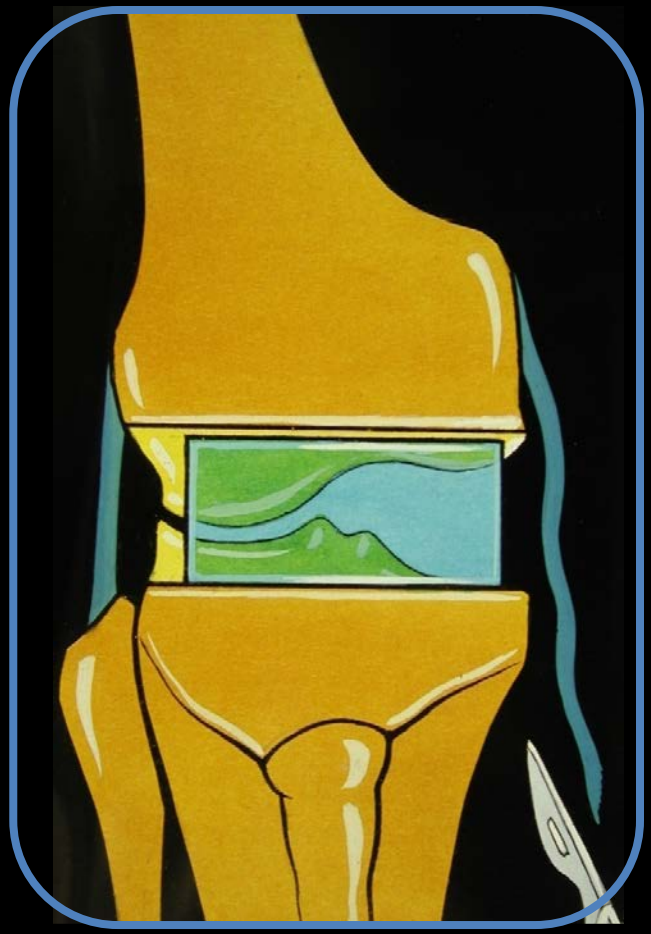
Horizontal

# Femoral Malunion Varus Deformity

EXTENSION GAP Asymmetrical

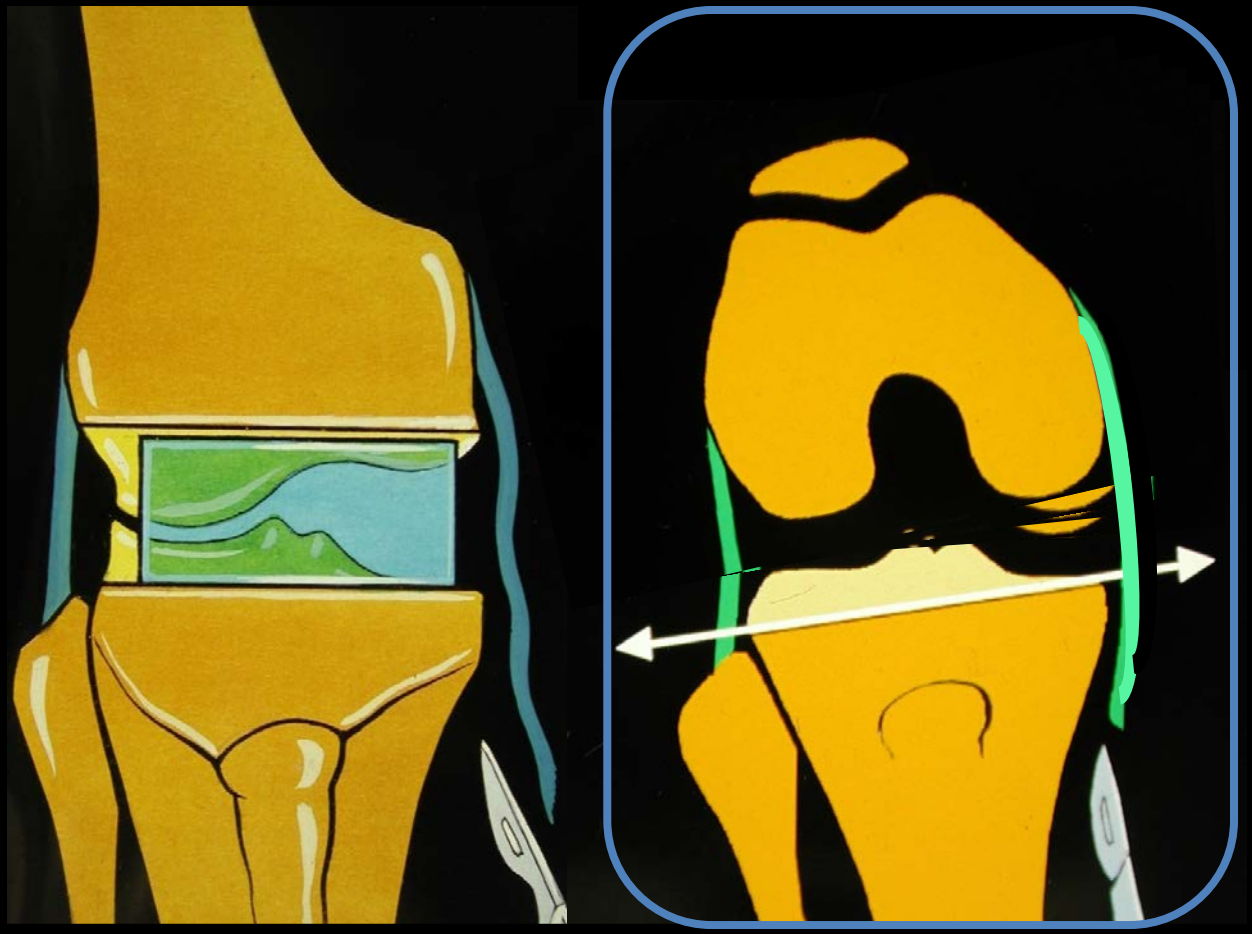


# Femoral Malunion Varus Deformity



*RELEASE*

# Femoral Mal Union Varus Deformity

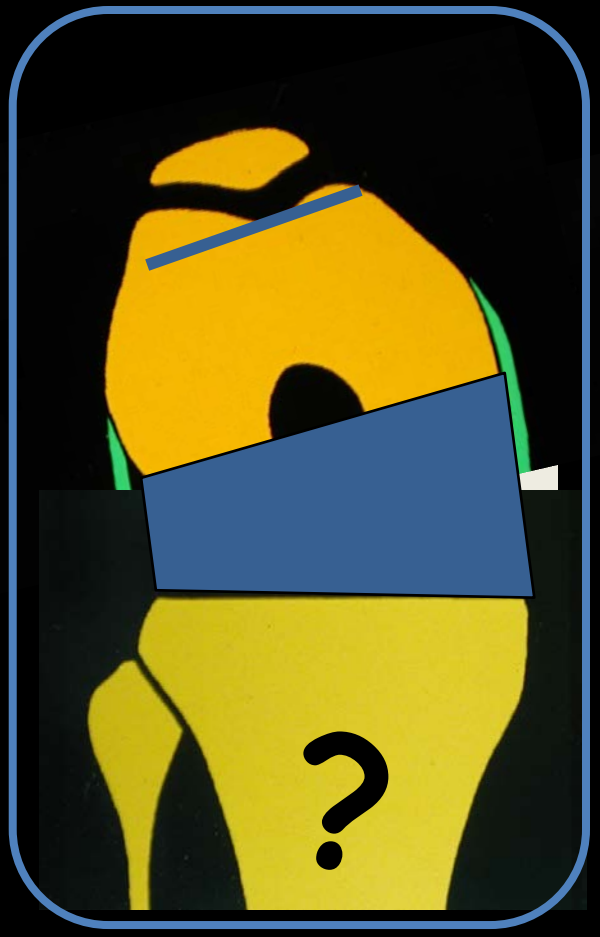


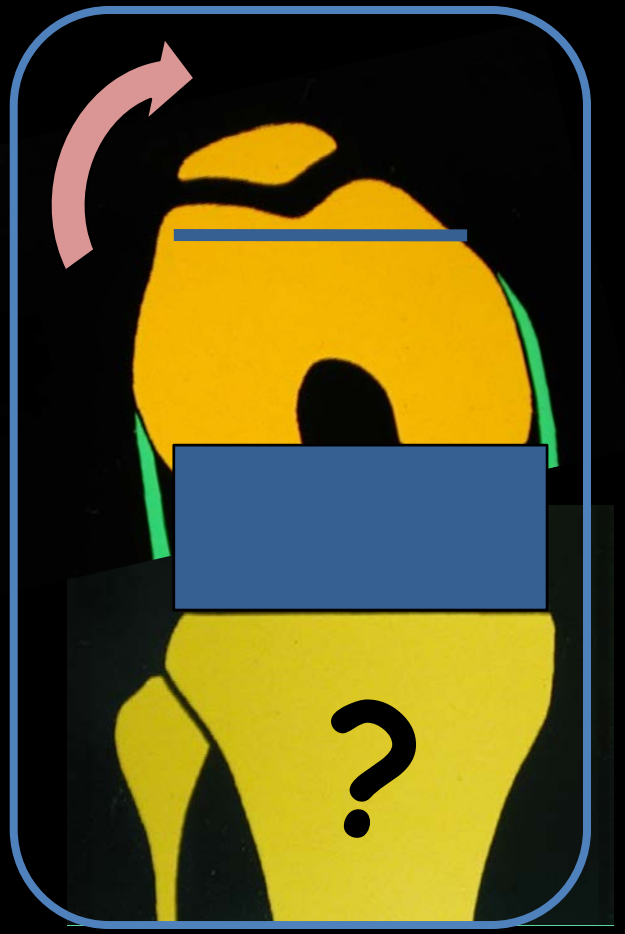
Mismatch
flex. / ext.

# Femoral Malunion Varus Deformity

In order to compensate the asymmetrical distal femoral cut :

- either accept a medial laxity in flexion
- Or internally rotate the femoral component.

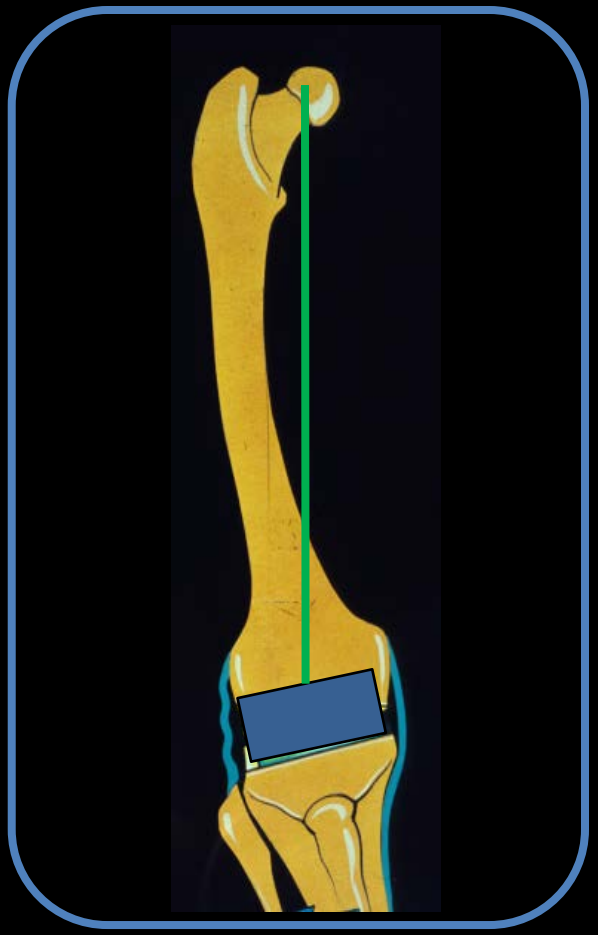



More constrained prosthesis vs Internal femoral torsion

# Femoral Malunion Varus Deformity

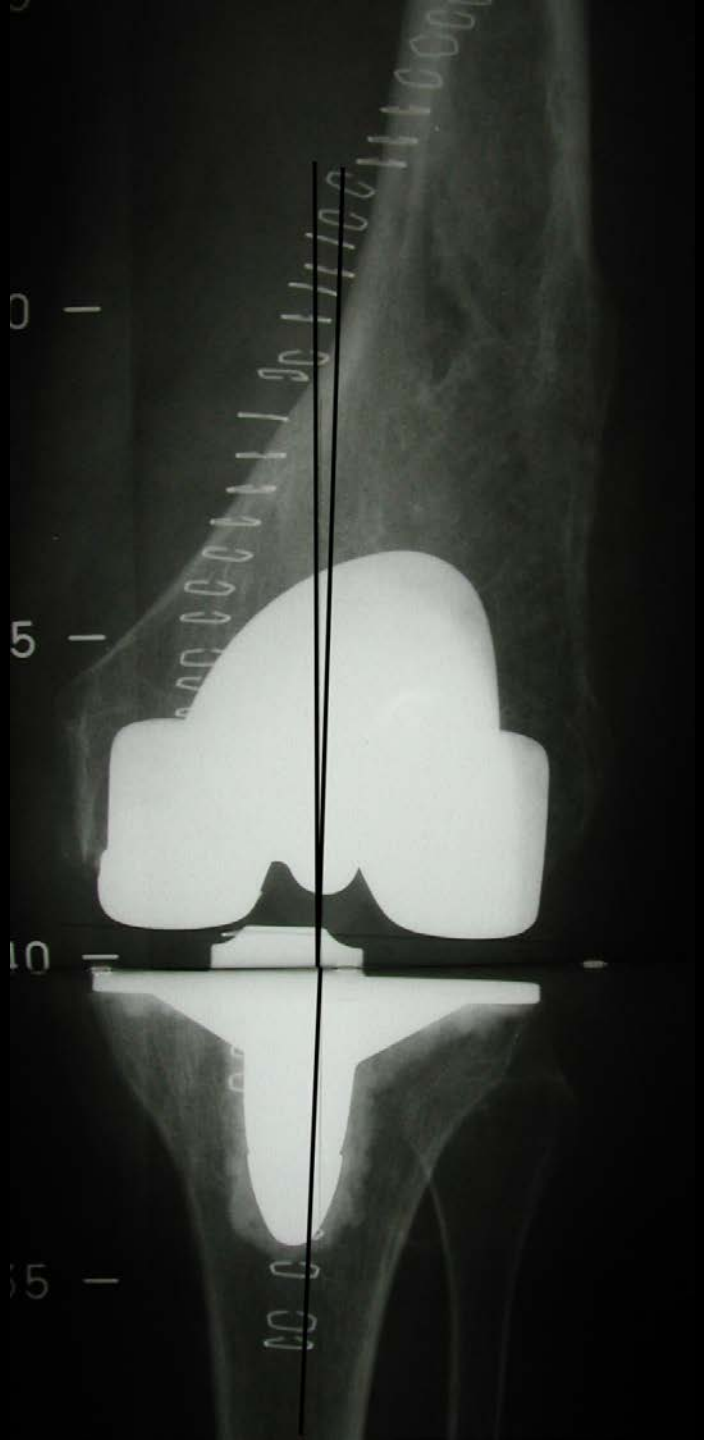
•In case of minor (<6°) Extra articular Varus Femoral Deformity we prefer to accept a small amount of residual varus in the femoral component (and no internal rotation )…



Residual varus


G
Appui
Monopodal


80
75
70
5

Clin Orthop Relat Res
DOI 10.1007/s11999-011-1988-6

CLINICAL RESEARCH

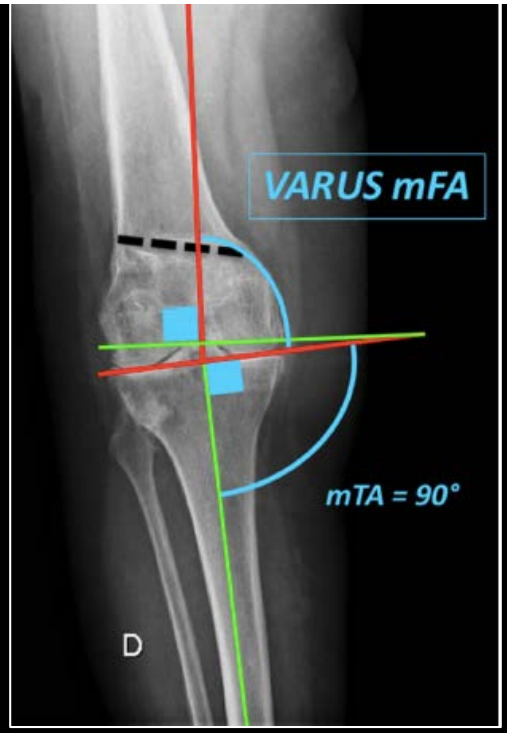
## Residual Varus Alignment does not Compromise Results of TKAs in Patients with Preoperative Varus

Robert A. Magnussen MD, Florent Weppe MD, Guillaume Demey MD, Elvire Servien MD, PhD, Sébastien Lustig MD, PhD

KNEE

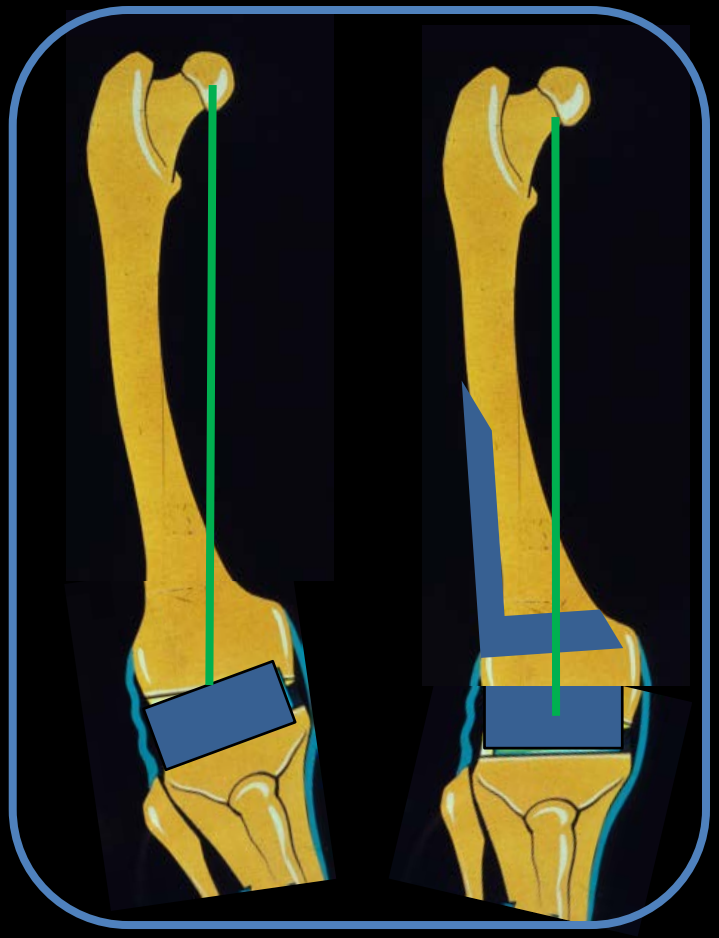
## Total knee arthroplasty after varus distal femoral osteotomy vs native knee: similar results in a case control study

Romain Gaillard[1] · Timothy Lording[2] · Sebastien Lustig[1] · Elvire Servien[1] · Philippe Neyret[1]



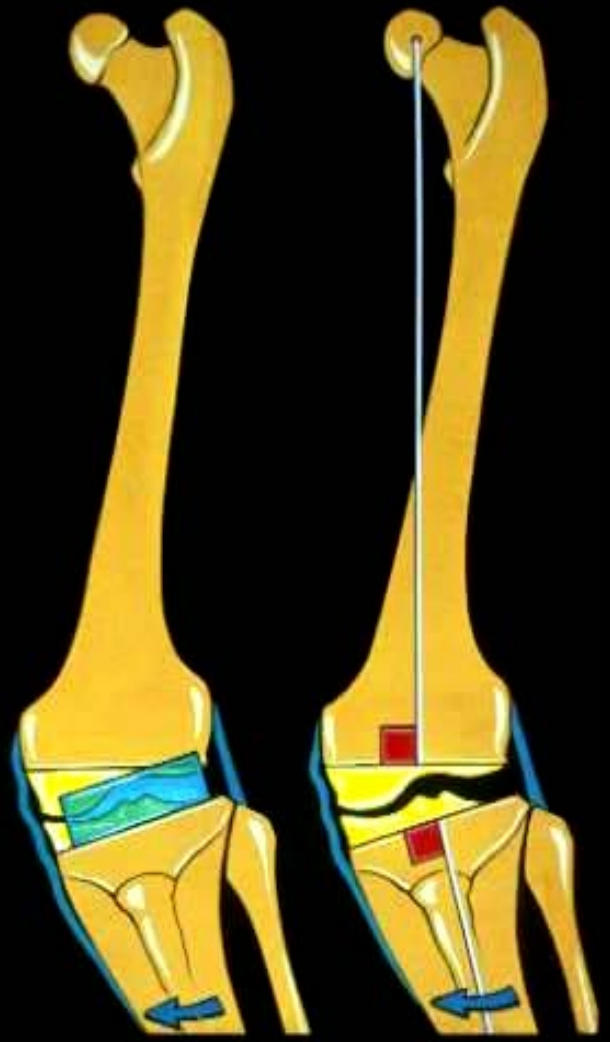
# Femoral Malunion Varus Deformity

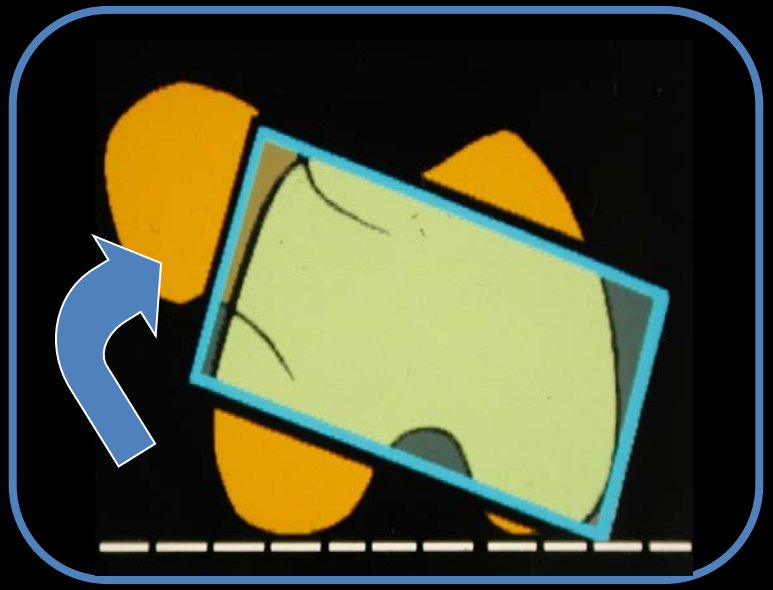
- In case of major (>6°) Extra articular Varus Femoral Deformity we must discuss a **corrective femoral osteotomy** (One or two stages surgery)



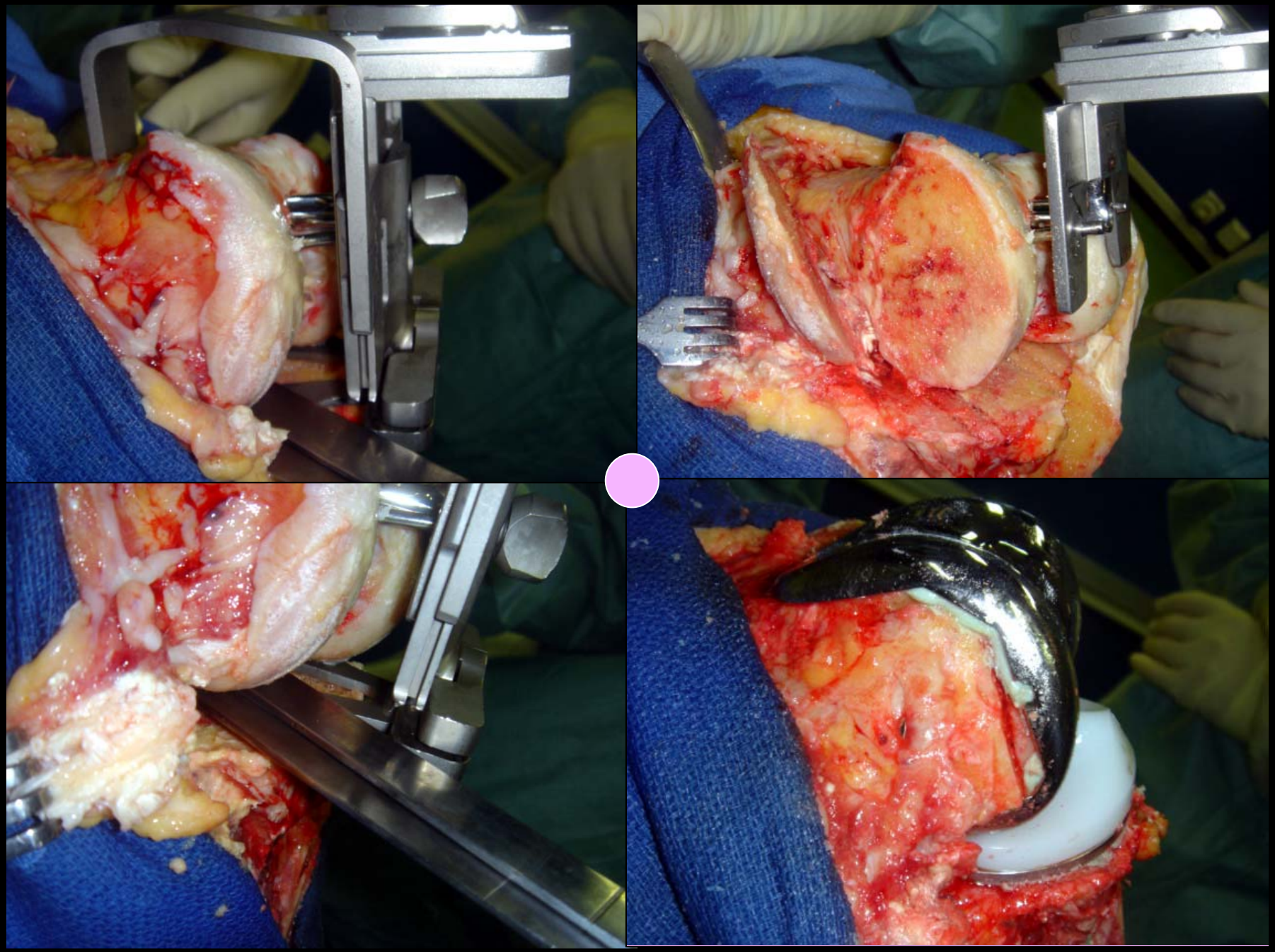
Excessive residual varus

# Femoral Malunion Valgus Deformity



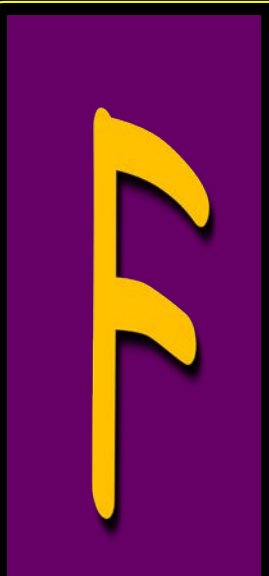


External rotation of
the femoral component

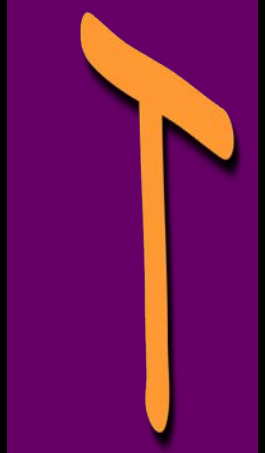


Knee joint

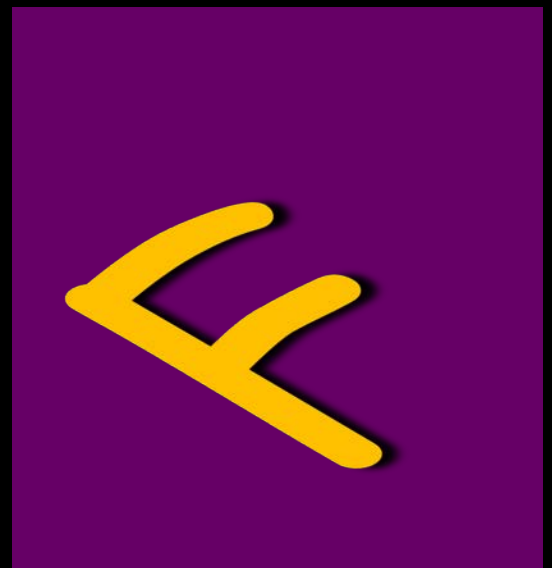
frontal



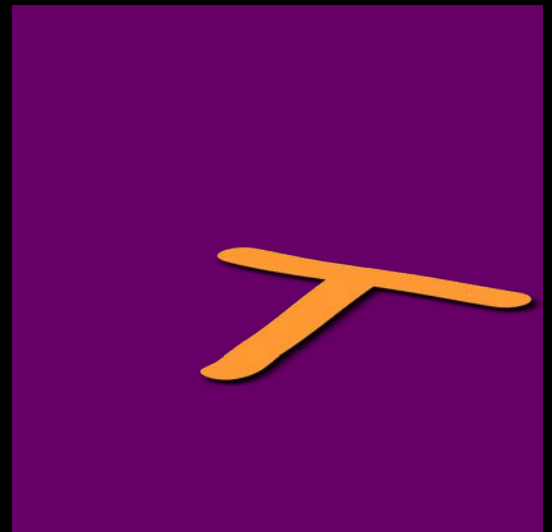
Knee joint



Sagittal

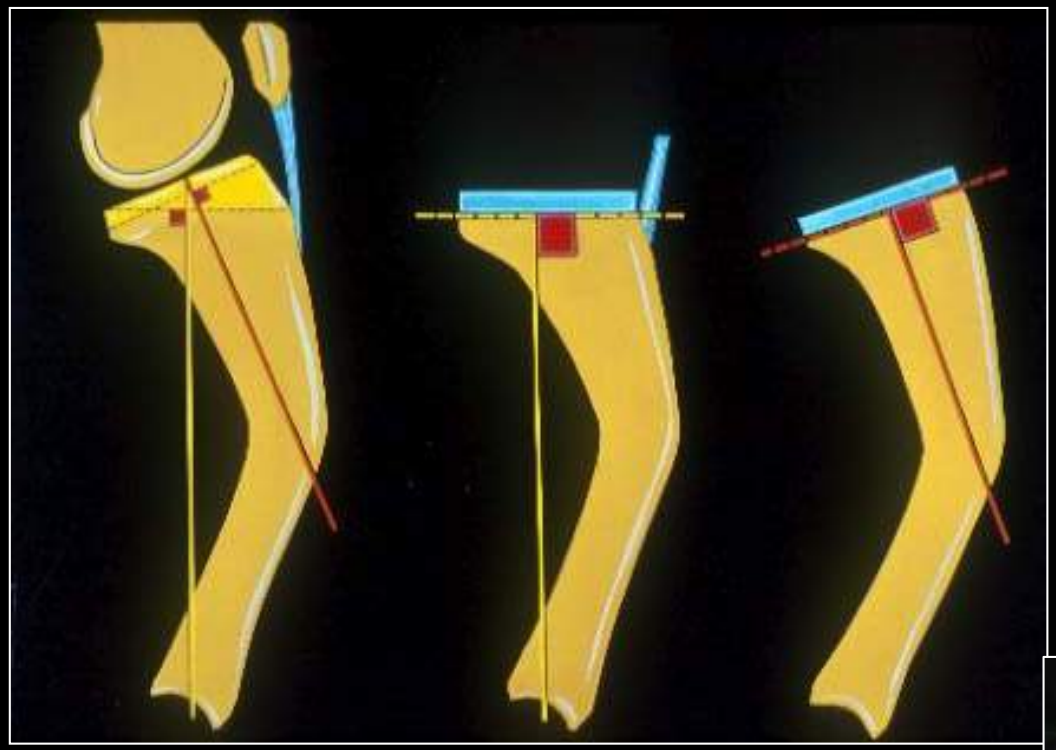


Knee joint



Horizontal

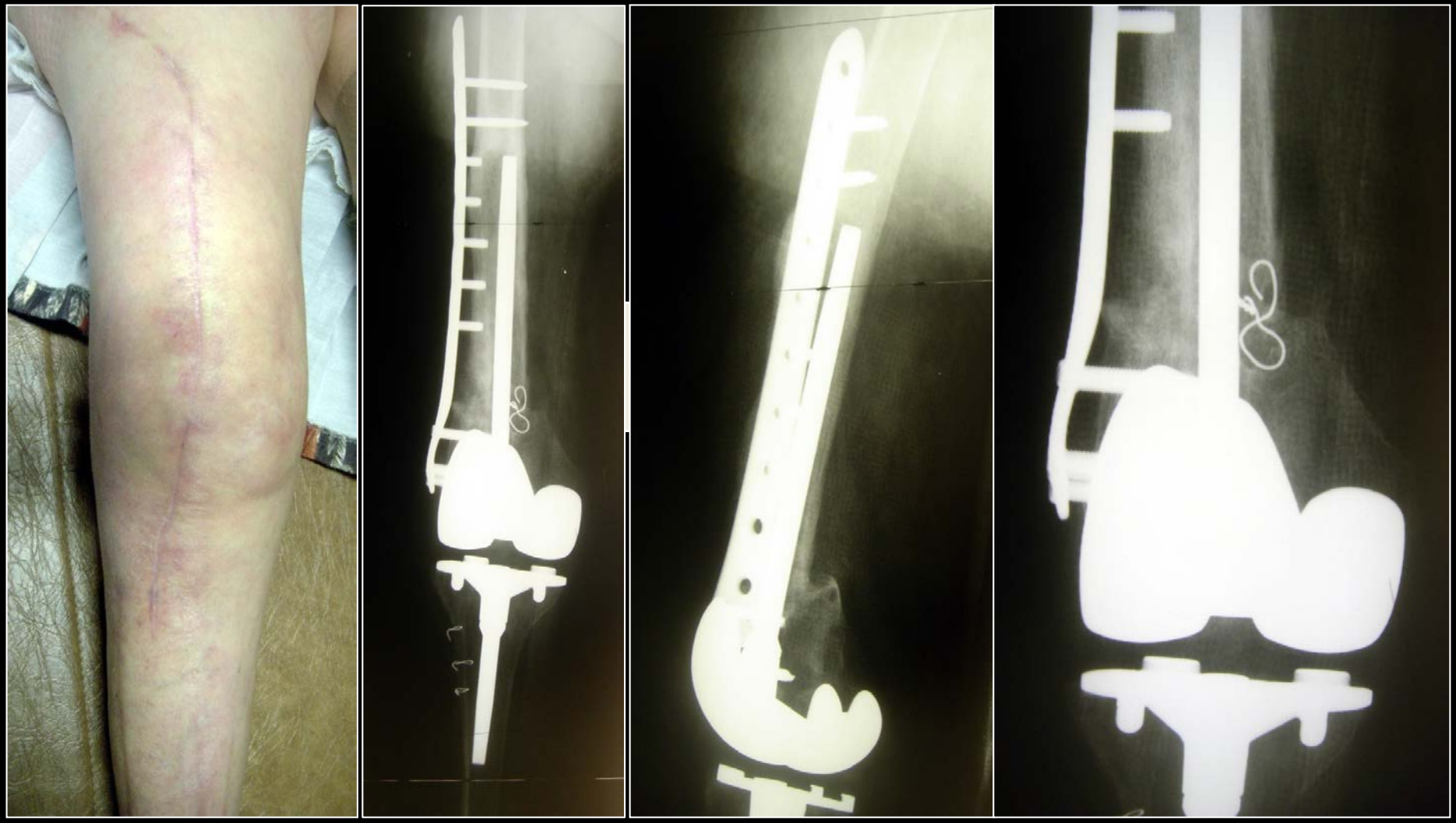
# Sagittal Deformity



# Sagittal Deformity

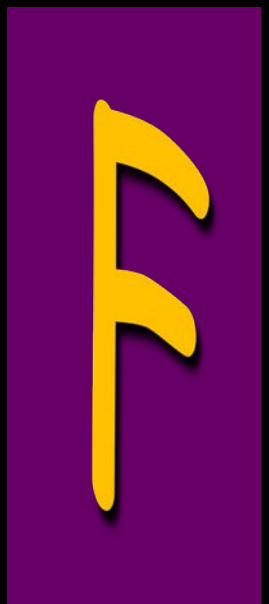
# Combining a DFO with a TKA ?

# *Not always a slam dunk ….*

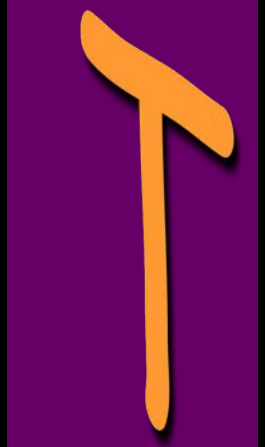



Knee joint

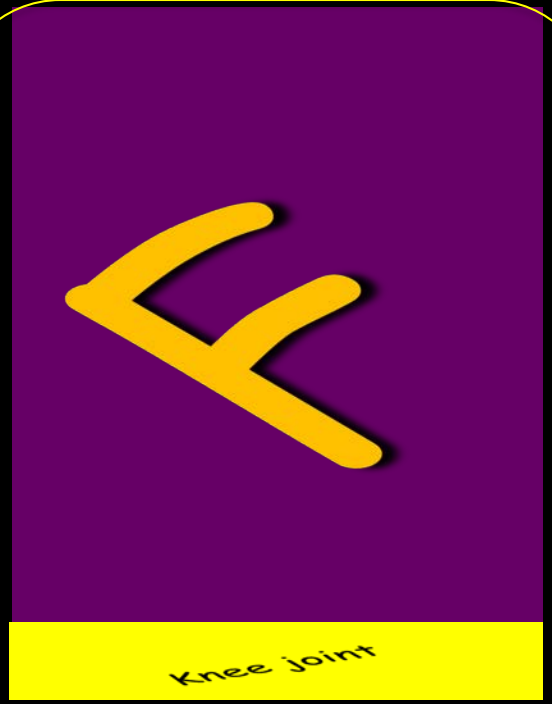
frontal



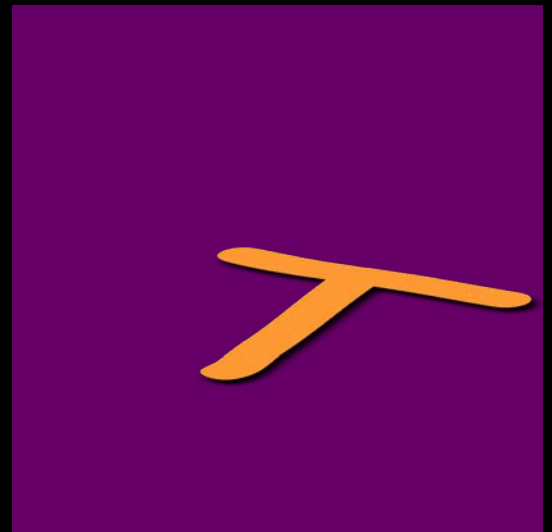
Knee joint



Sagittal



Knee joint



Horizontal

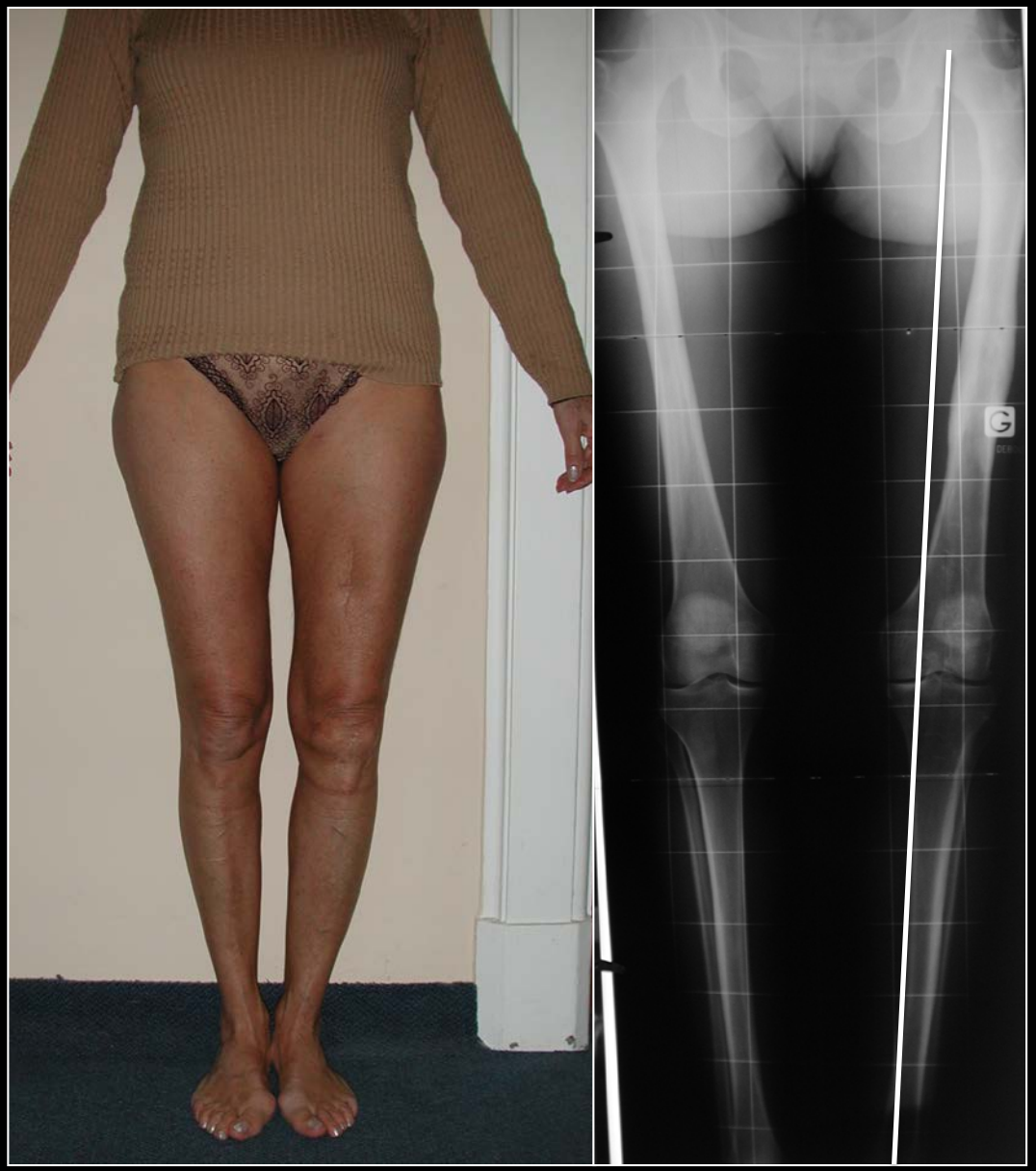
# OA after axial plane (rotational) malunion

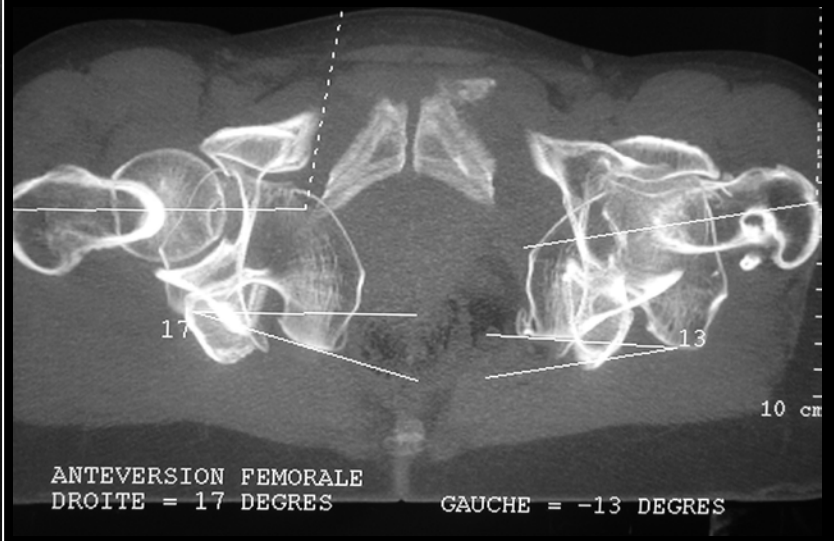
Femoral ***external*** rotation ⟶ medial OA

Femoral ***internal*** rotation ⟶ lateral OA

Sometimes Obvious

Sometimes Tricky






30° external rotation !

# HORIZONTAL DEFORMITY

LYON GENOU CENTRE ALBERT TRILLAT

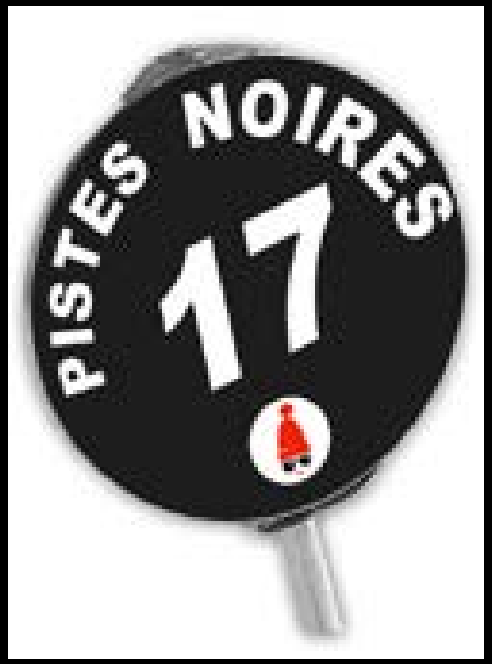
**81 OA on malunion**

- Rarely isolated
- Femur : external torsion 6 cases (6 MFTOA)
  internal torsion 1 case (1 MFTOA)
- Tibia : internal torsion 1 case

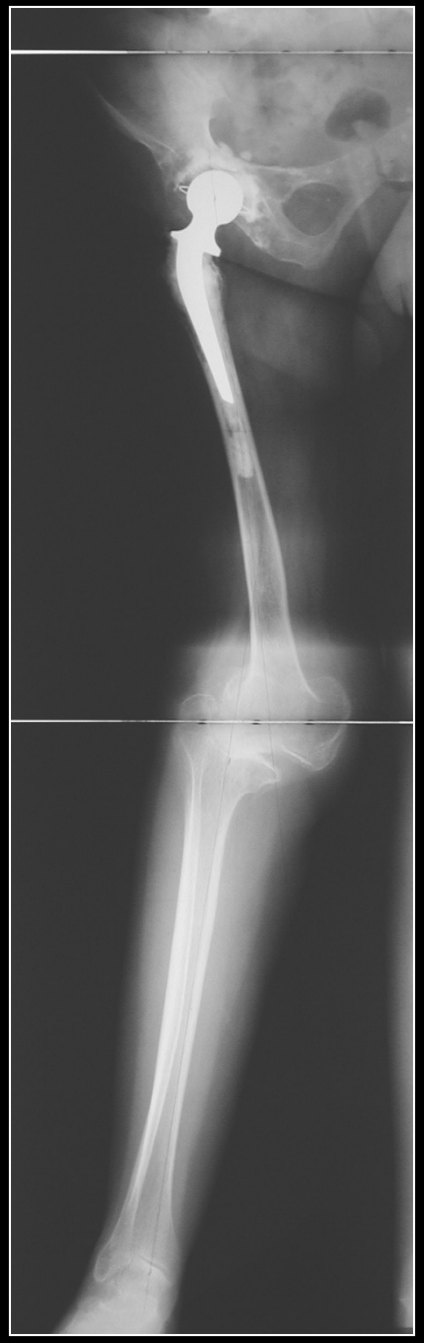
**Limit <> 20°**

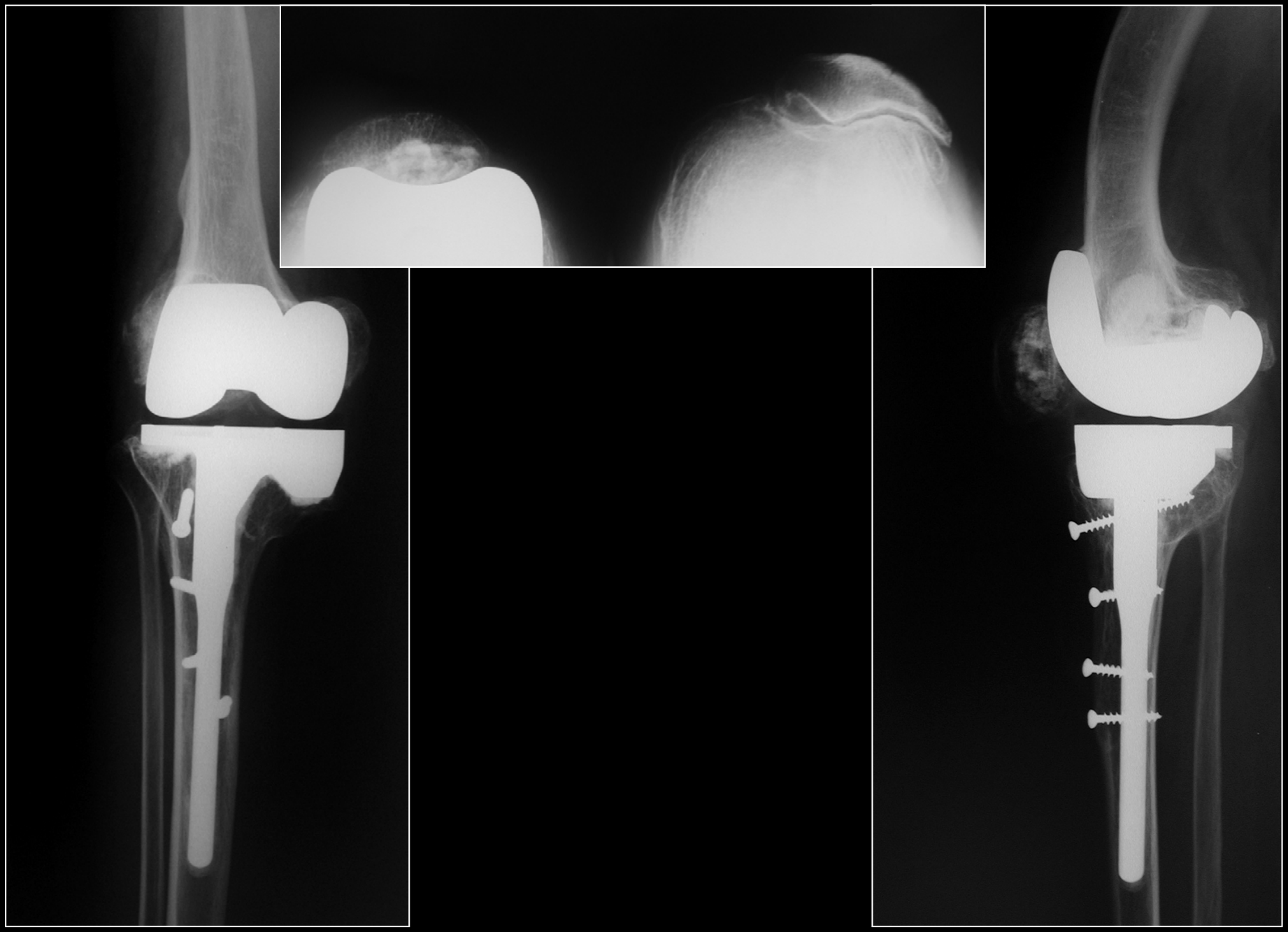
→ **Rotational osteotomies = 2** (20° and 25°)

→ **TKA = 6** (7° to 13°)

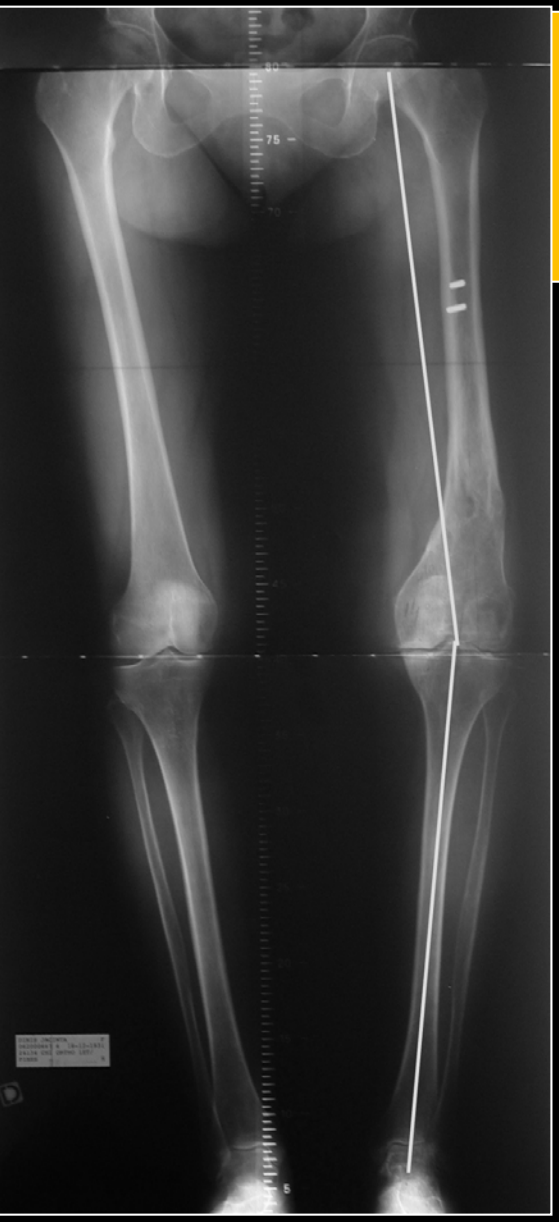

PISTES NOIRES
17


CLOSED
AREA





# Take Home Message



## Extra-articular deformity

1. Never straight forward.
2. Correct pre-operative planning .
3. Mechanical (angle or axis)

   and not anatomical deformity .
4. Frontal femoral deformity

   (Varus ++) .

# Thank You

*Lyon by night*