

# MULTILIGAMENT INJURIES

## Chronic Cases

*Overview about treatment options*

*CCOS Group*

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BUT...

# Chronic lesion

Patients with delayed surgery > 1 months

Patients with failed initial conservative treatment / surgical repair

Patient with failed early reconstructions

More difficult to stabilize

You cannot expect « spontaneous » healing consecutive to the trauma

Now the situation is ...

I had an injury more than three months ago....

I will tell you this story which changed my life... i'm UNSTABLE ... PAINFULL ... UNEMPLOYED ...



# 3 Different situations

Delayed diagnosis  
No surgery done

Failure of medical /  
conservative  
treatment

Failure of surgical  
treatment

**Full clinical assessment (ligament)**

Patient assessment (way of life)

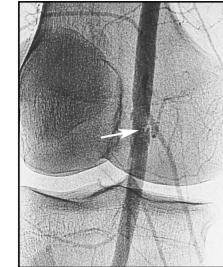
**Patient X-rays + MRI + Stress X-rays**

**EMERGENCY ROOM****Knee dislocation****Reduction emergency****Clinical vascular & nervous Exam****P  
U  
L  
S  
E****Negative / diminished / asymmetric****ORTHOPADIC DEPARTMENT****Imobilisation Extension Brace****Radiographs-MRI****Diagnosis & surgical plan****Delayed ligamentous Reconstruction & repair within 1-2 weeks****VASCULAR UNIT****Possible vascular injury****Arteriogram****Vascular management Repair if possible**

# High rate of Complications

## Injury time

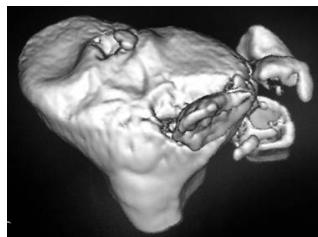
Injury severity underestimation  
Irreducible dislocation  
Vascular problems & associated injuries  
Inadequate treatmentplanning



## Intraoperative

Bleeding  
Compartment Syndrome  
Iatrogenic Neurovascular Injury  
Ligament reconstruction complications

## Postoperative



Wound Breakdown  
Infection  
DVT  
Arthrofibrosis STIFFNESS  
Pseudarthrosis  
Recurrent instability  
Foot drop  
Pain



# CLASSIFICATION

Simple

Medial

Lateral

Combined

Medial

( lateral dislocation )

Lateral

( Medial dislocation)

Complexe

(rotatory dislocation)

Pure

Anterior

Posterior

# Agravating clinical factors

## Age

*"Coup de fouet arthrosique » (Dejour)*

**Chronicity of the lesion(Texier, Jarry)**

This is not a contra indication

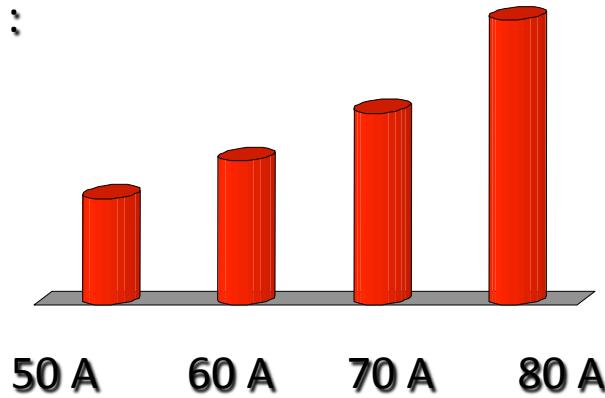


## Leveel of activity (Chantraine)

## OVERWEIGHT

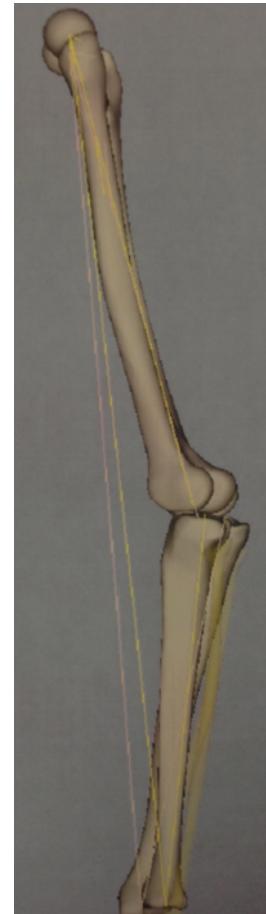


OA :



# Clinical examination: general examination

- Sequela ?
  - Nerves
  - Vascular
- Testing and grading of ALL the LAXITY
- Recurvatum ?
  - Posterior ligamentous structures and capsules are torn
- Classification according to SCHENK



# Clinical examination : CRUCIATE

- Morphotype
  - Varus or valgus bilateral
  - Recurvatum
- Anterior LAXITY
  - Lachman Trillat test
  - Pivotshift
  - Reverse Picot( Jakob test)
- Posterior LAXITY
  - ATT
  - Posterior drawer
  - **REDUCIBILITY of the POSTERIOR TRANSLATION +++**

# Clinical examination : peripheal laxity

- Medial
  - Laxity in valgus + flexion
  - Laxity in valgus+ extension
- Lateral
  - Laxity in varus
  - Reverse Pivotshift
  - Walk in varus + recurvatum
  - Recurvatum test
  - Dial test



# Chronic clinical examination : GAIT analysis

Gait examination : varus and recurvatum (varus thrust)



# History of previous treatments

Surgeries reports

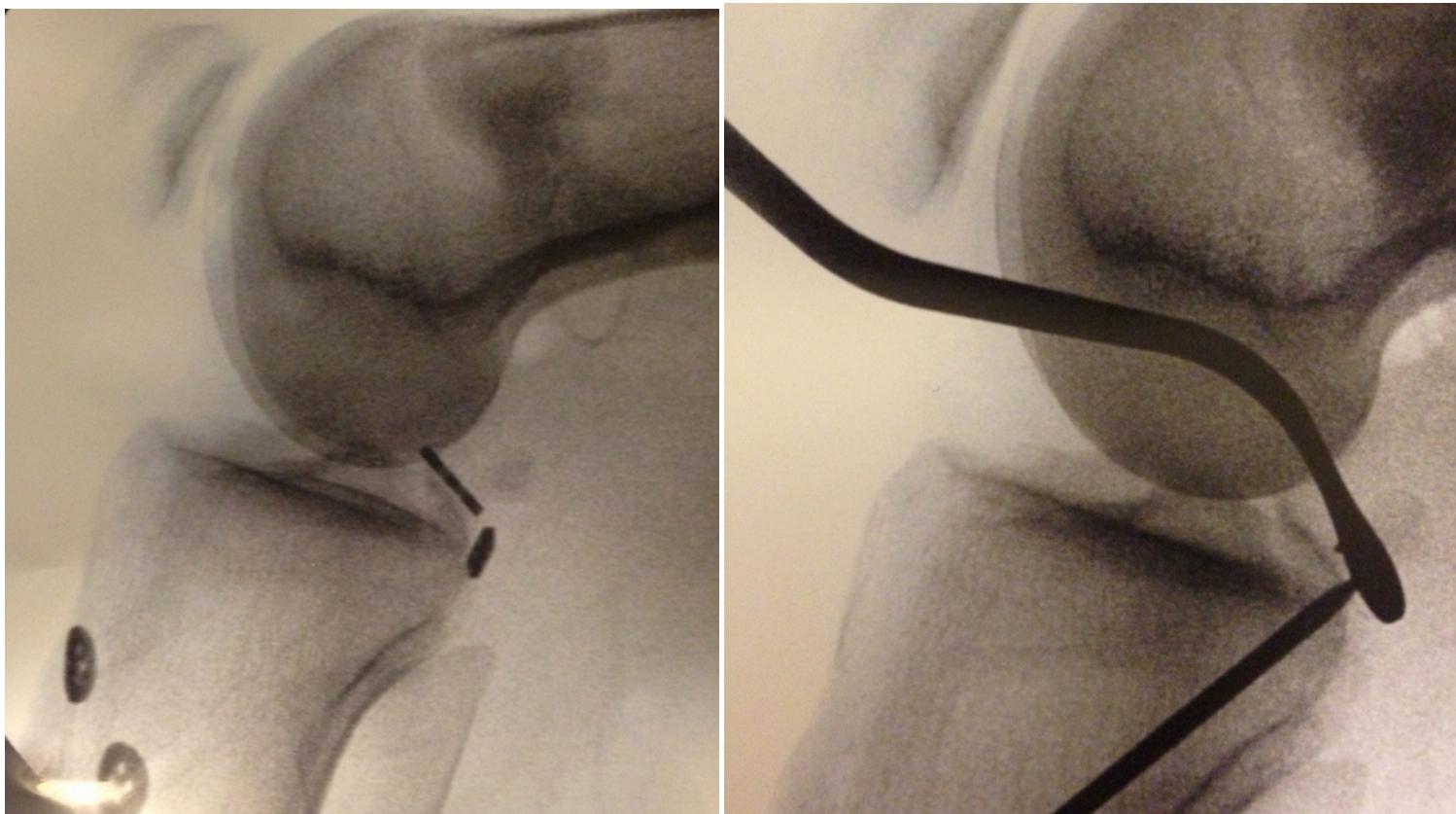
Complications

Techniques

Infections

Harvested tendons

...



PCL bony avulsion arthroscopic fixation

# X-rays, stress X-rays,MRI, CT-scan & others

Confirm the diagnosis

Identify lesions  
on anatomical  
structures

Depict  
complications:  
angioCT  
if multiligament  
injury

# Full and systematic assessment

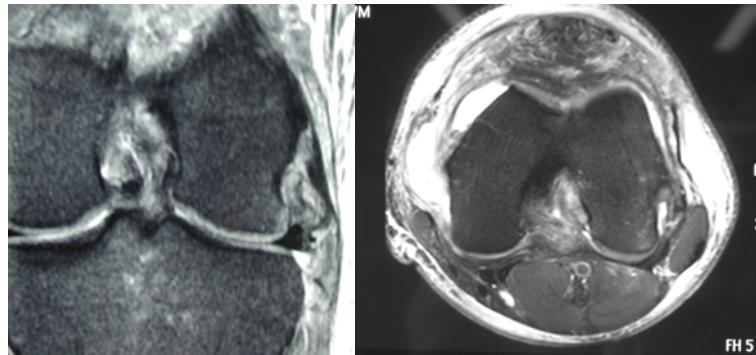
**Always in Chronic cases**



et



« Acute » MRI (coronal slides++)



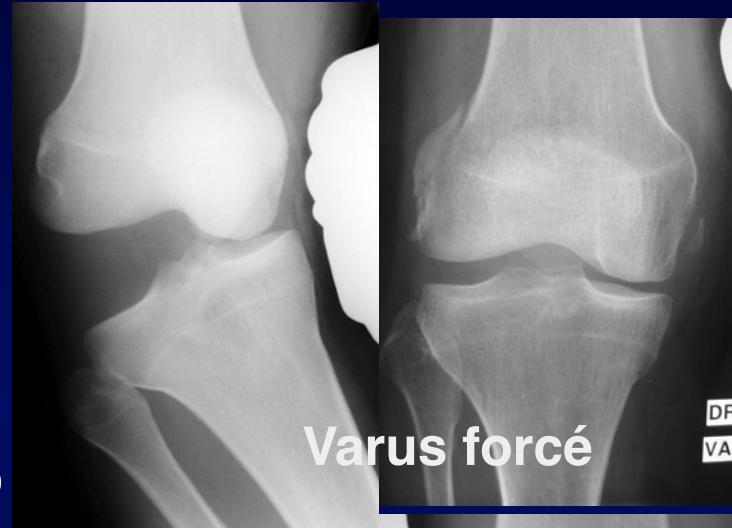
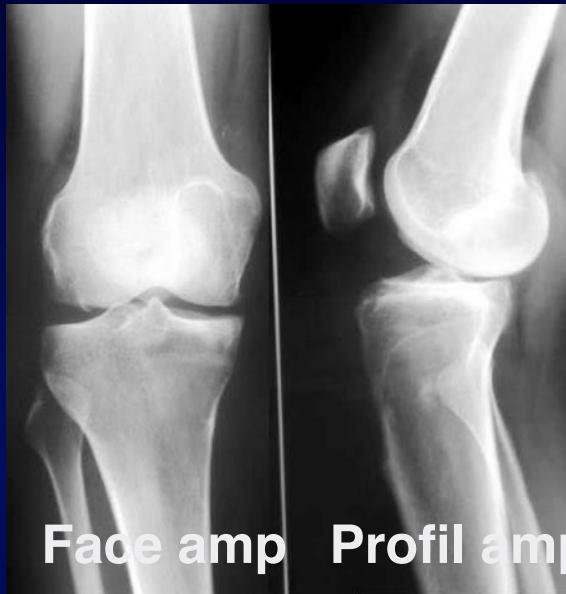
Hardware  
Previous techniques  
Tunnels



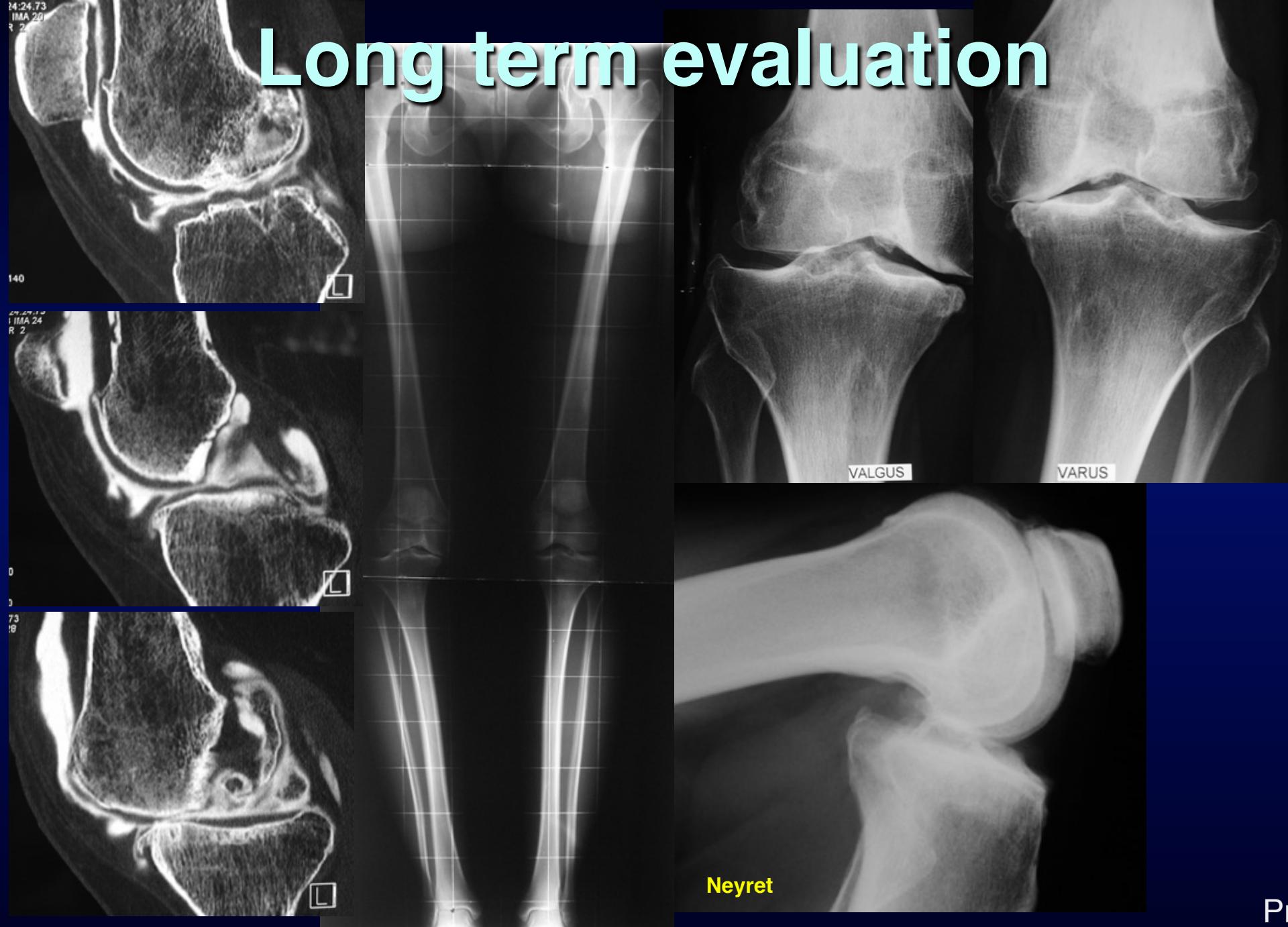
ALIGNMENT

# Short term evaluation

X-rays

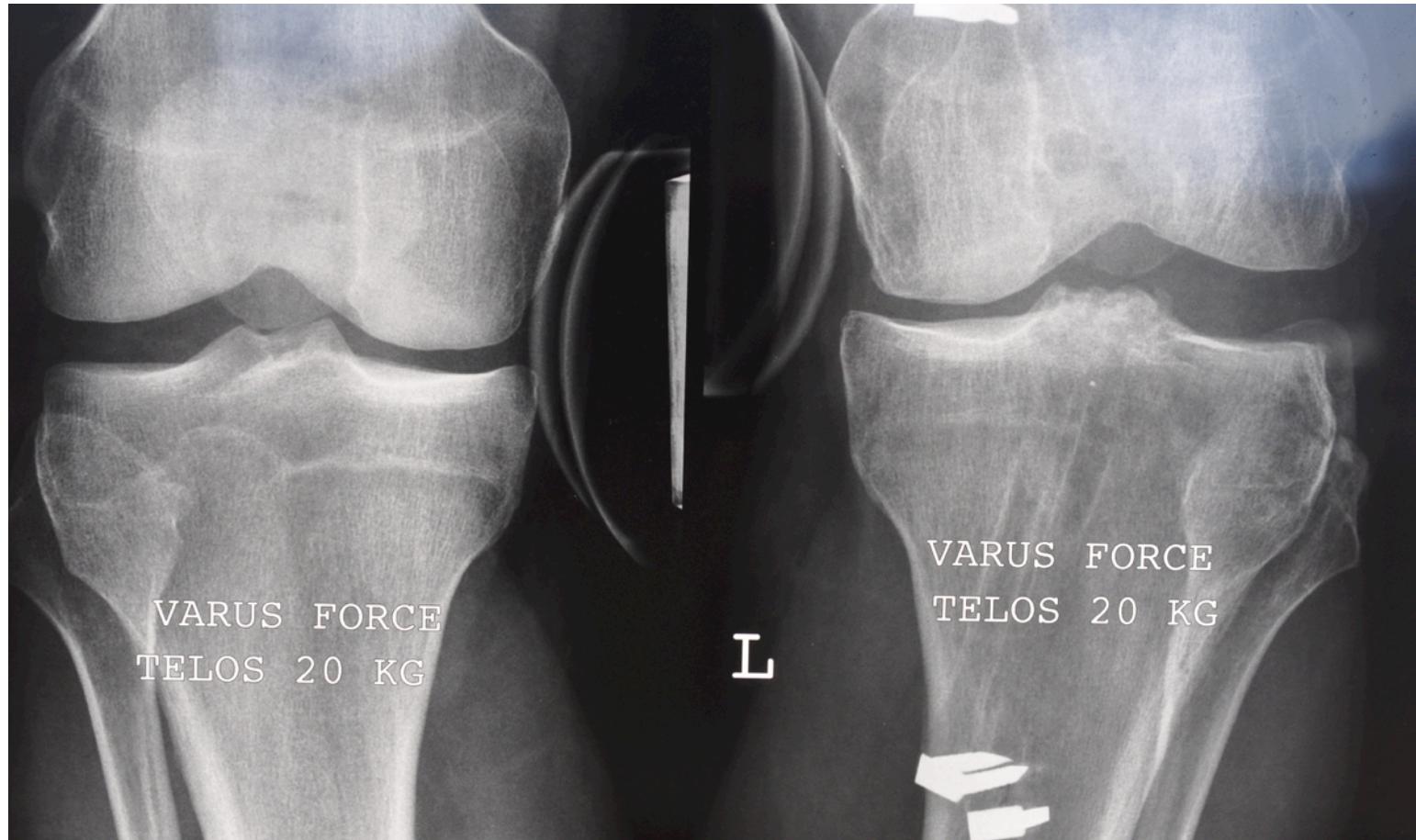
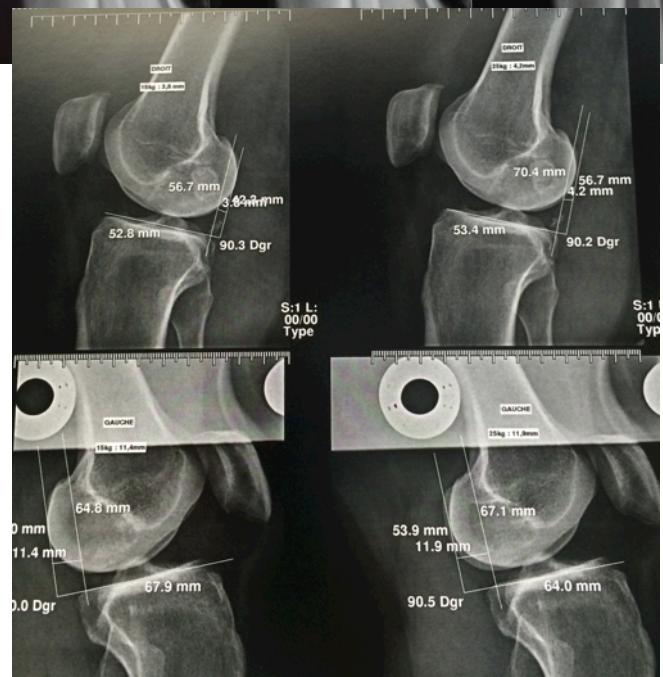
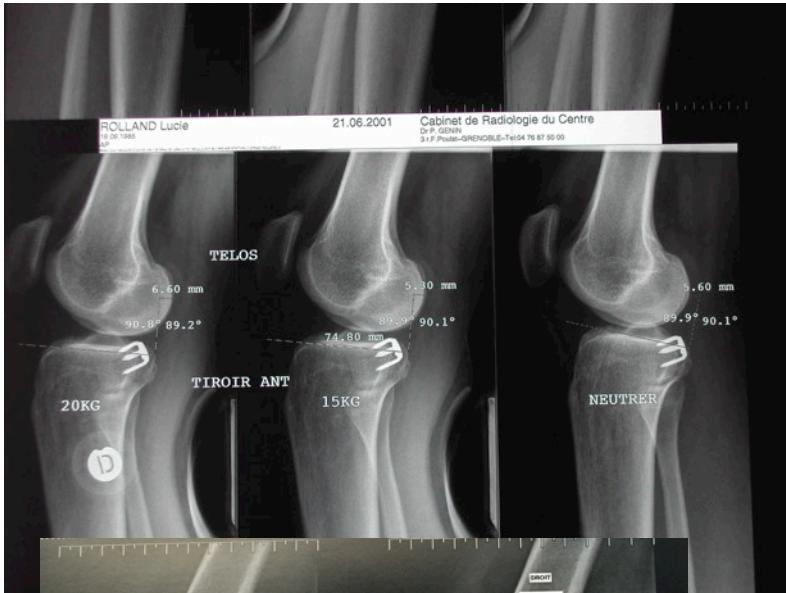


Pr C. HULET



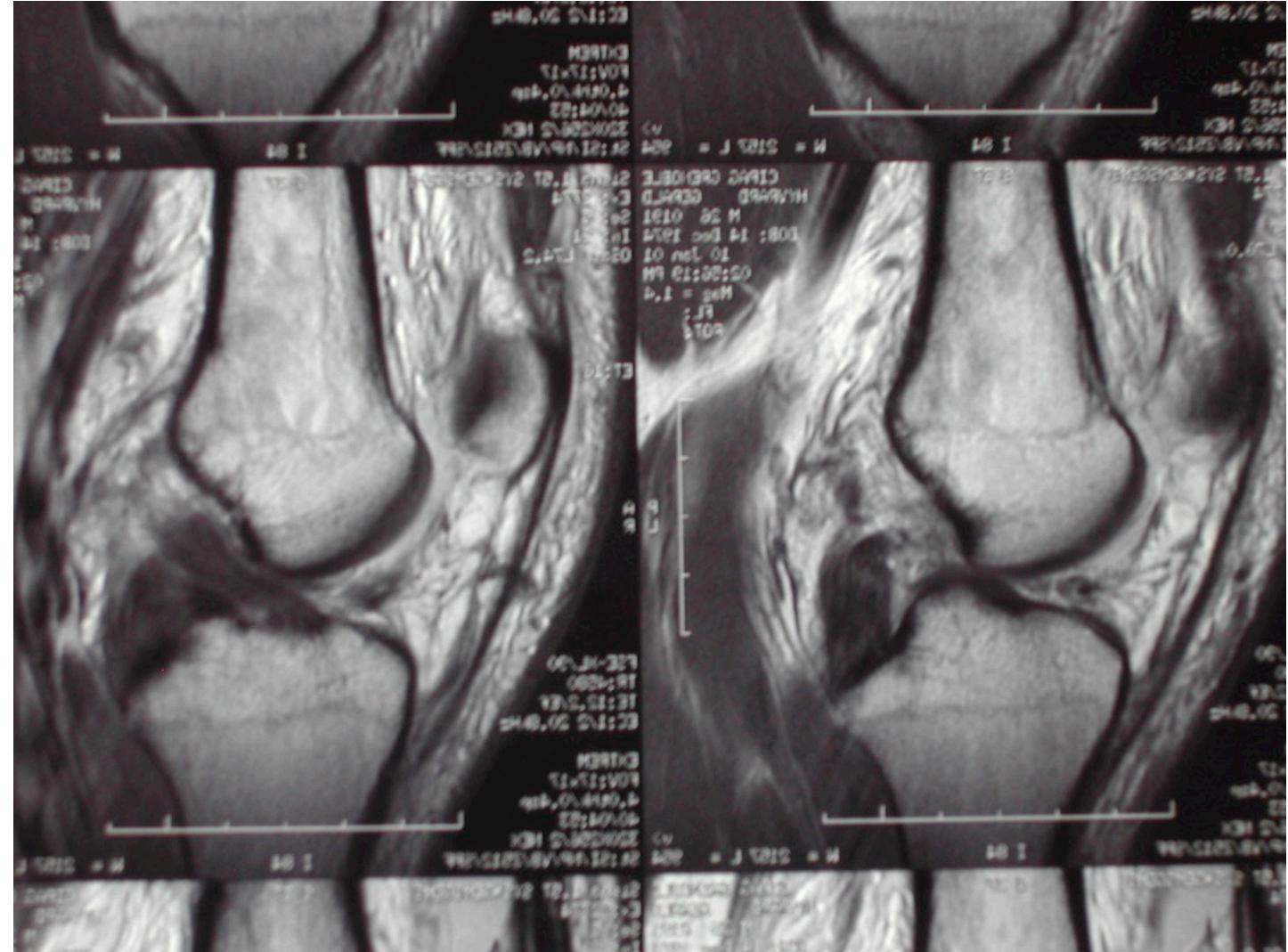
Pr C. HULET

# Stress X-rays : quantitative measurements



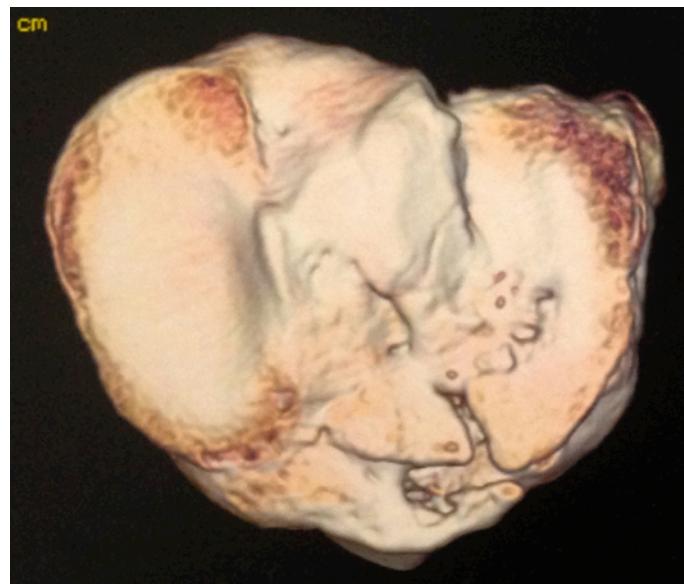
# MRI assesment

TRY to catch the initial MRI  
Redo an MRI especially if former surgery



# CT-scan assessment

- ARTICULARE SURFACE ORIENTATION
- Bone DEFORMITY
- TUNNELS placement (anatomic ?)
- Tunnels enlargement ?
- Plane for next surgery



# Treatment options

Delayed diagnosis  
No surgery done

Failure of medical /  
conservative treatment

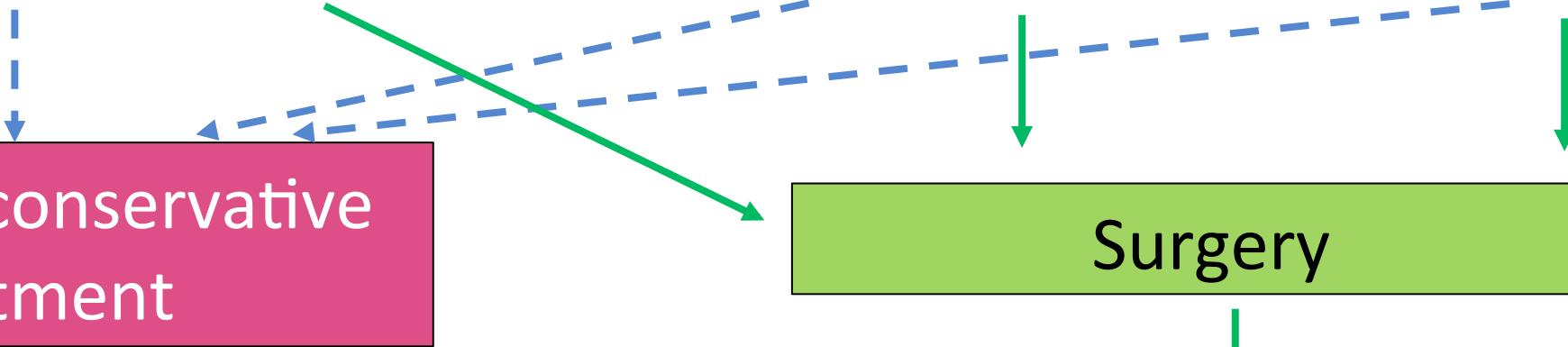
Failure of surgical  
treatment

CONFIRM conservative  
treatment

Physiotherapy  
Splint ...

Surgery

Make your plane



# Chronic cases > 3 months

## Example : ACL/PCL + LCL+ PLC

### Clinical examination

Standart X-rays + stressed X-rays (telos ATT & varus)  
+ long standing X-rays  
+MRI



LATERAL OPENNING in VARUS stress

NORMOAXED or VALGUS

HTO + cruciate ligament rec. (ACL / PCL)  
+/- anatomic PLC reconstruction

Cruciate ligament reconstruction  
+ anatomic PLC reconstruction

NO WEIGHT bearing for 6 weeks  
Hinged Splint for 12 weeks

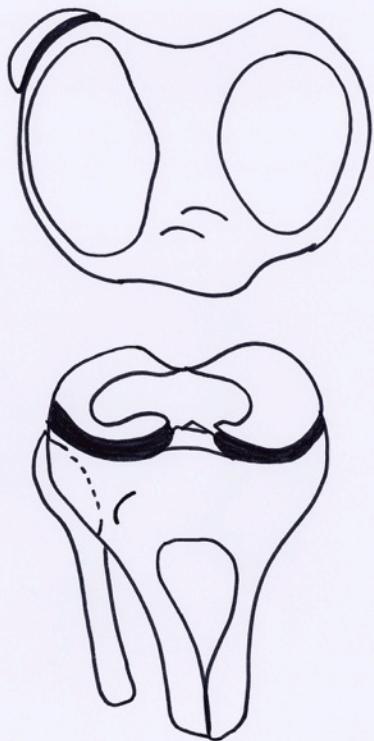
ANTERIEUR



POSTERIEUR



TIBIA FACE SUP



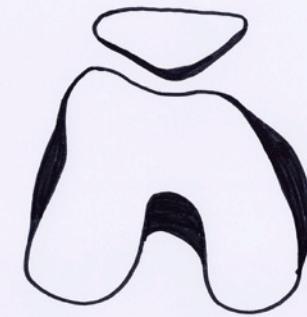
FACE LATERALE



FACE MEDIALE



FEMUR FACE INF

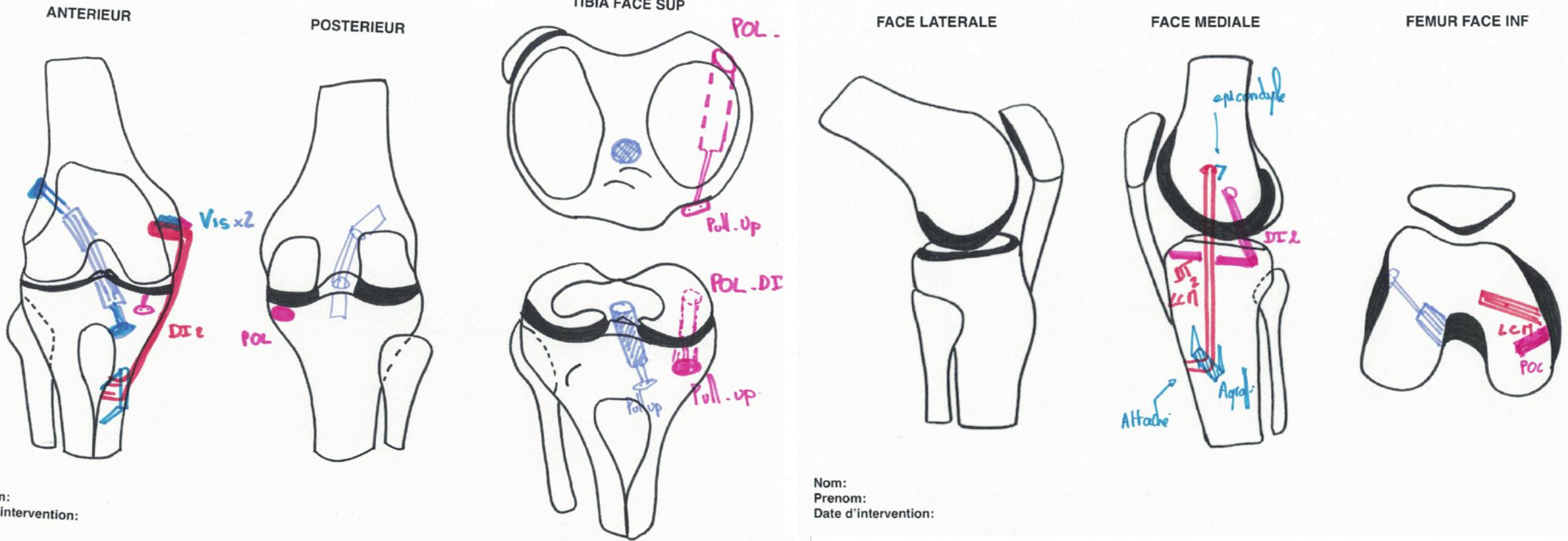


Nom:  
Prenom:  
Date d'intervention:

Nom:  
Prenom:  
Date d'intervention:

# MAKE YOUR PLANE

Ligament	Greffé	Moyen de fixation Tibial	Moyen de fixation Fémoral	Séquence de fixation	Degrés de fixation	Technique de reconstruction	Matériel à prévoir
LCA					20°		
LCP							
LLI							
LLE							
POP							
POL							
TR							
MPTI							



# MAKE YOUR PLANE

Ligament	Greffé	Moyen de fixation Tibial	Moyen de fixation Fémoral	Séquence de fixation	Degrés de fixation	Technique de reconstruction	Matériel à prévoir
LCA	DT4 homo	Pull up X1	Pull Up	④	20°		
LCP			vis (x2)	①			
LLI	DT 1/2	attache + rafolle					
LLE							
POP							
POL	DI 1/2	Pull-up	Vis 6x23-	②	0°		
Autre		Reparat'n capsul		③	0°		
		Sutur RL					



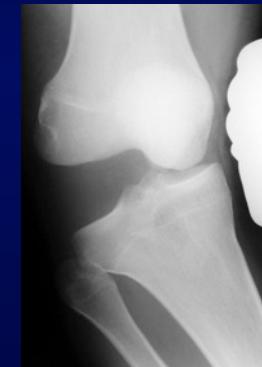
# Clinical aggravating factors

## Morphotype

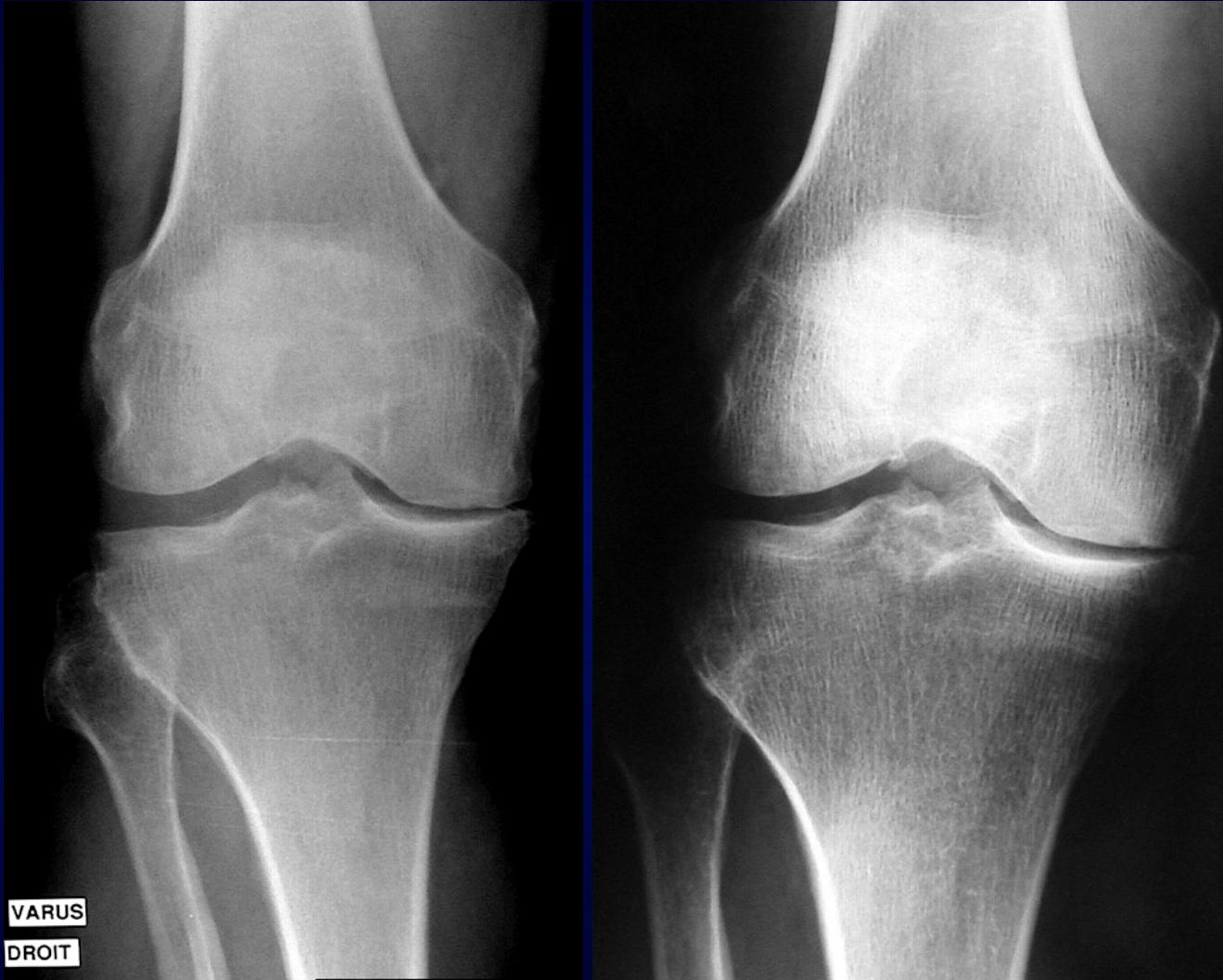
Frontal (Noyes)

**Triple varus of Noyes : MM,GVR,  
Lateral thrust & Recurvatum**

varus double OA incidence



# Accentuation du varus

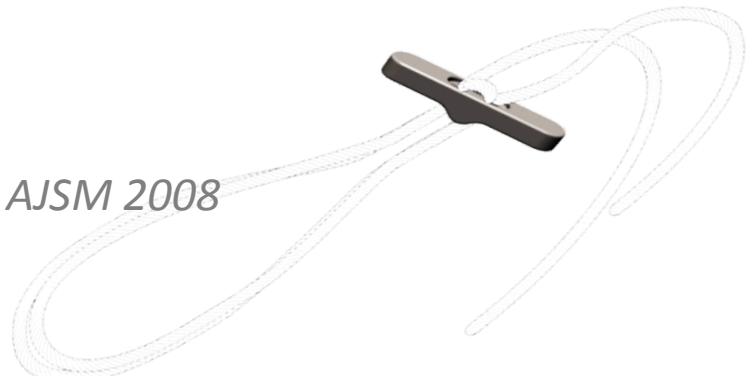


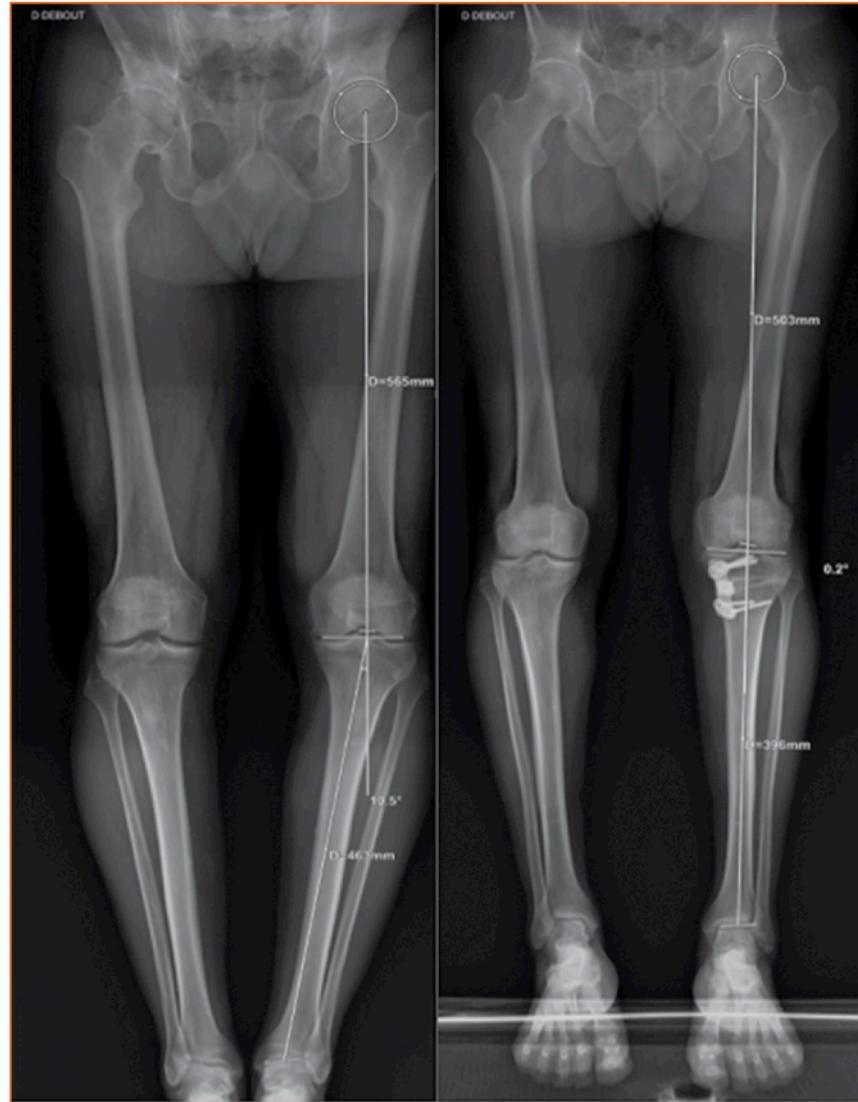
Usure interne  $\rightleftharpoons$  laxité externe

# Rational for High Tibial Osteotomy?

- Only for **chronic postero-lateral laxity**
- Varus knee ↗ loads on postero-lateral structures → failure of the reconstruction  
*Christel (KSSTA 2003), Savarese (J Orthop Trauma 2011)*
- Experimental efficiency proved on LHM varus

*Laprade et al, AJSM 2008*





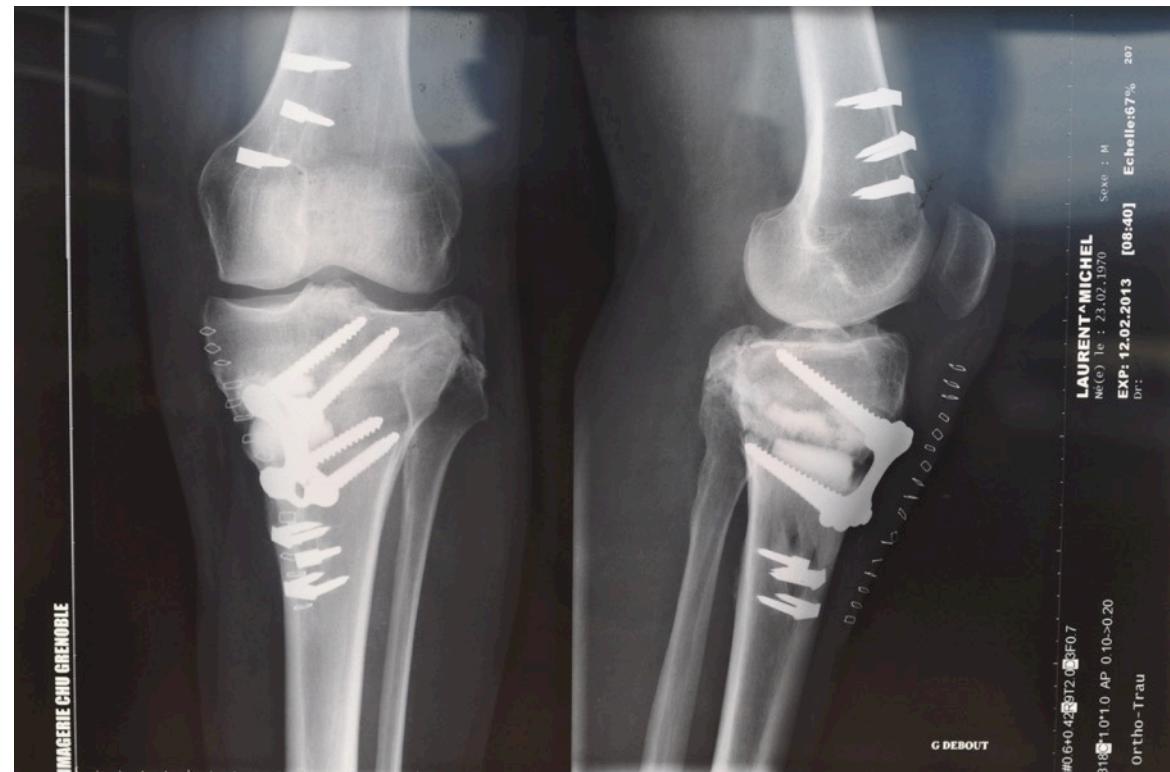
# High Tibial Osteotomy

- 3 prerequisites:
  - **Chronic PL laxity > 3 months**
  - **Varus in standing long X-Rays > 5°**
  - **Lateral joint opening** in monopodal support
- Correction of lateral opening in varus and lateral rotation (*Laprade, Am J Sport Med 2008*)
- Normocorective HTO with par medial opening
  - Goal :  $180^\circ < \text{HKA} < 183^\circ$
- SLOPE correction ?
- Concomitant ligament reconstruction / **delayed @ 3 mois**



# Severe osteochondral lesions

- Medial OA ( Gr I et II Ahlback)
  - HTO with medial wedge opening technique
- Medial OA Gr III et IV
  - Isolated HTO ?
  - Double osteotomy if FMA <90°
  - If GROSS laxity central + périphérique :
    - Aged patient : considere semi constrained TKR ?



# Treatment options : Chronic with OA



# Alternative options for specific patients



Aged patients (?)

Constrained prosthesis?

*Bonnevialle et al, RCO, 2007*

# Take Home Message

- 1) Take all the history since trauma
- 2) Patient evaluation : obesity -expectations
- 3) Clinical evaluation of residual Laxity
- 4) Stress X-rays, MRI (initial & actual), CT scan i surgery
- 5) Surgical plan
- 6) Reconstruction +++ (Graft choices)
- 7) One step surgery
- 8) Cautious rehabilitation
- 9) Results : be modest

# SFA



# 2018

**STRASBOURG**  
PALAIS DES CONGRÈS  
**13>15 DÉCEMBRE**

PRÉSIDENT DU CONGRÈS :  
PHILIPPE CLAVERT



Rupture du LCA après 50 ans. S. Lustig (Lyon) , JC Panisset (Echirolles)  
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Traitement arthroscopique de l'arthrose du coude. Y. Carlier (Mérignac), P. Desmoineaux (Versailles)



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