# UKA *versus* Osteotomy anatomic criteriae

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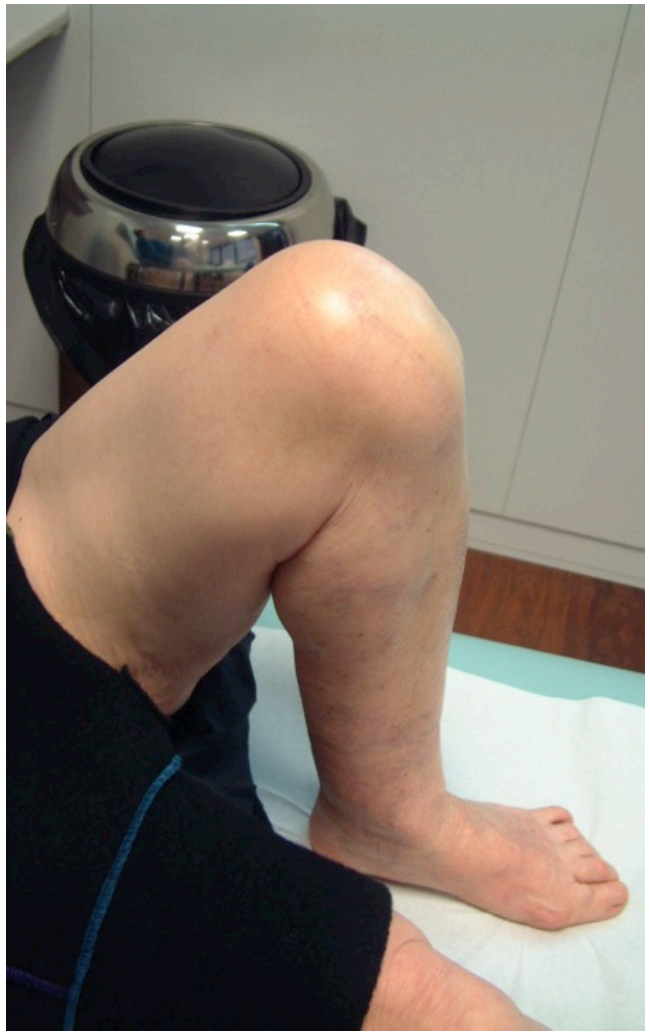
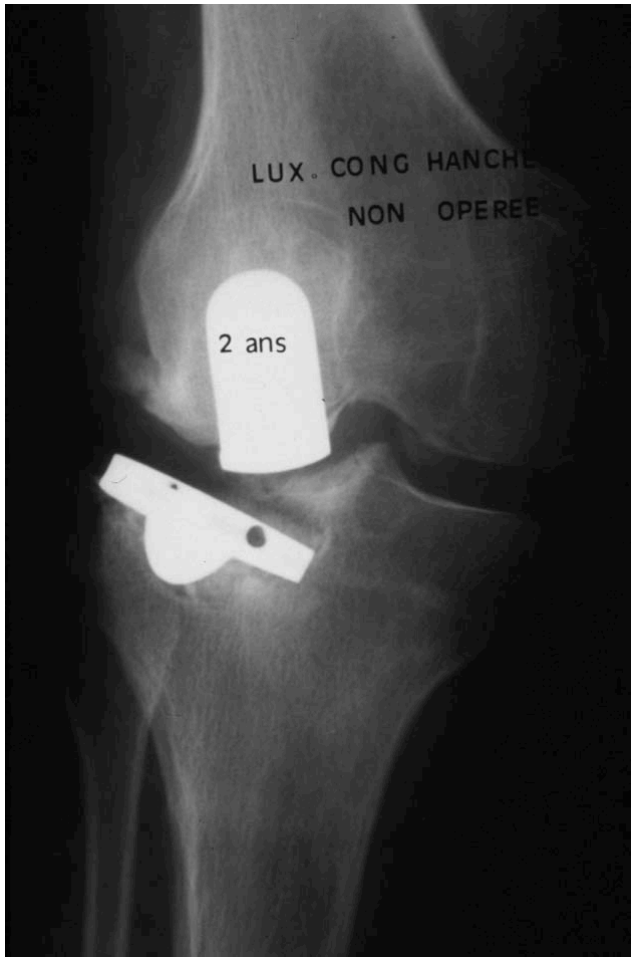
# UKA is a safe and reliable procedure



# …but UKA is not an easy procedure




Poor fixation

Overhanging

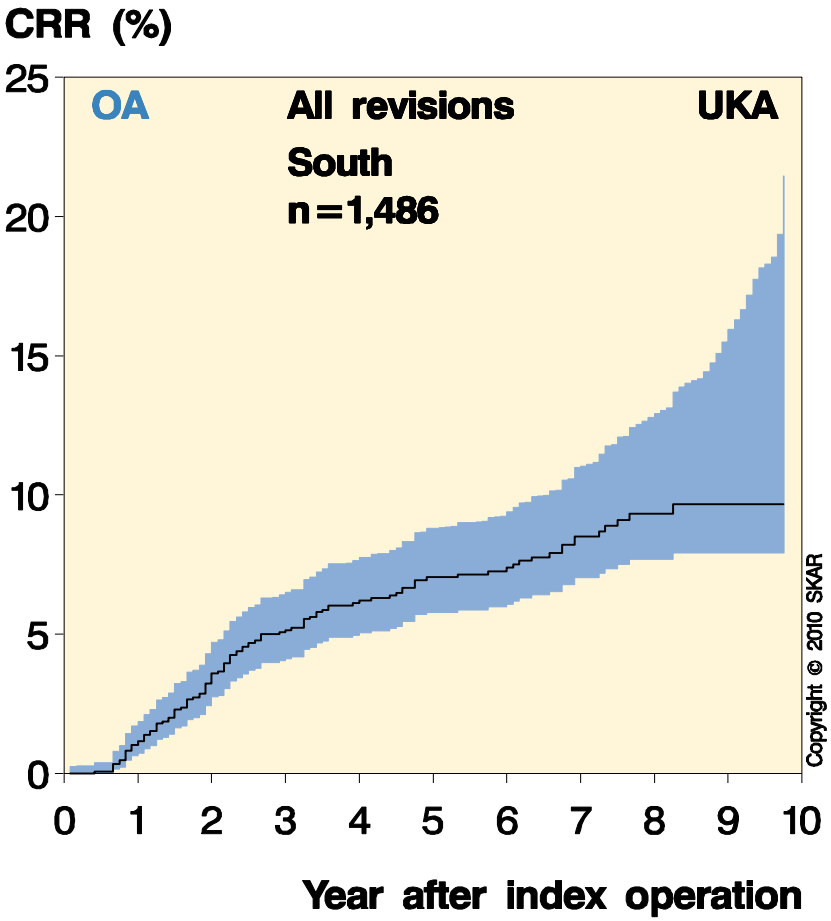
Malpositionning

# 10-y survivorship of UKA: **70% to 98%**

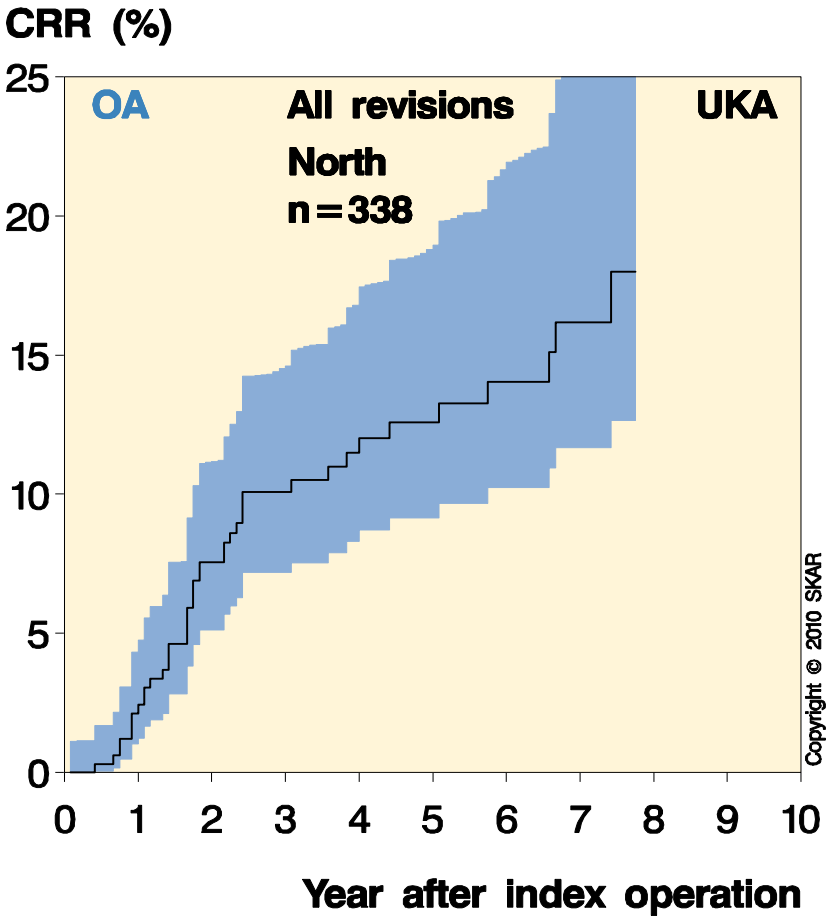
| Year | Authors | Compartment | Prosthesis | 10-Year Revision Rate (percent) (95% CI) |
|---|---|---|---|---|
| 1992 | Capra & Fehring[7] | Medial/Lateral | Marmor | 94 (?) |
| 1993 | Heck et al[15] | Medial/Lateral | Marmor | 91 (86–97) |
| 1996 | Cartier et al[10] | Medial/Lateral | Marmor | 93 (81–100) |
| 1998 | Tabor & Tabor[40] | Medial/Lateral | Marmor | 84 (?) |
| 1999 | Squire et al[39] | Medial/Lateral | Marmor | 89 (84–95) |
| 1994 | Knutson et al[17] | Medial | Marmor | 92 (89–94) |
| 2002 | Lidgren[24] | Medial | Marmor | 86 (76–88) |
| 1991 | Neider[29] | Medial | St. Georg | 80 (?) |
| 1994 | Weale & Newman[44] | Medial | St. Georg | 90 (?) |
| 1997 | Ansari et al[2] | Medial | St. Georg | 87 (81–93) |
| 1994 | Knutson et al[17] | Medial | St. Georg | 89 (82–92) |
| 2002 | Lidgren[24] | Medial/Lateral | St. Georg | 94 (84–97)* |
| 1998 | Murray et al[28] | Medial | Oxford | 98 (93–100) |
| 2000 | Kumar & Fiddian[19] | Medial | Oxford | 85 (?) |
| 2002 | Lidgren[24] | Medial | Oxford | 86 (76–89) |
| 1991 | Scott et al[38] | Medial/Lateral | Brigham | 85 (67–99) |
| 2002 | Lidgren[24] | Medial/Lateral | Brigham | 90 (76–90)* |
| 1998 | Hasegawa et al[14] | Medial | PCA | 88 (?) |
| 2002 | Lidgren[24] | Medial/Lateral | PCA | 70 (55–78) |
| 1998 | Bert[5] | Medial | MBUKA | 87 (?) |
| 1999 | Berger et al[4] | Medial/Lateral | Miller-Galante | 98 (96–100) |
| 2002 | Argenson et al[3] | Medial | Miller-Galante | 94 (91–97) |
| 2002 | Lidgren[24] | Medial/Lateral | Endo-Link | 91 (83–93) |

# Swedish register: **regional variations**

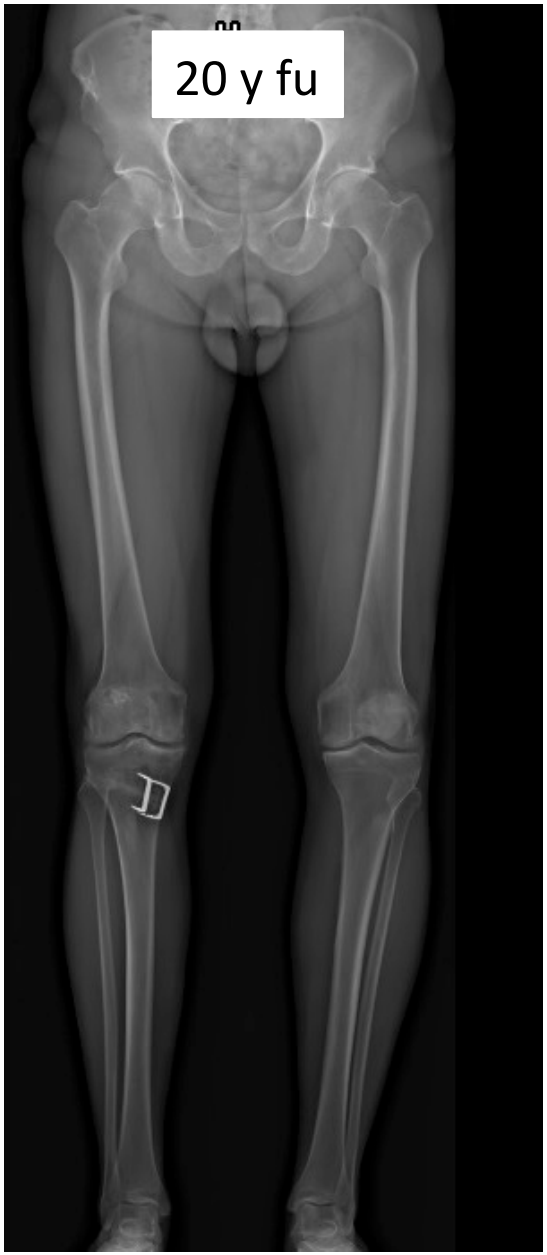
***6% at 10 y***




***>25% at 8 y***



# HTO is a safe and reliable procedure




# Survivorship of HTO

The Swedish Knee Arthroplasty Register annual report 2013
http://www.knee.se

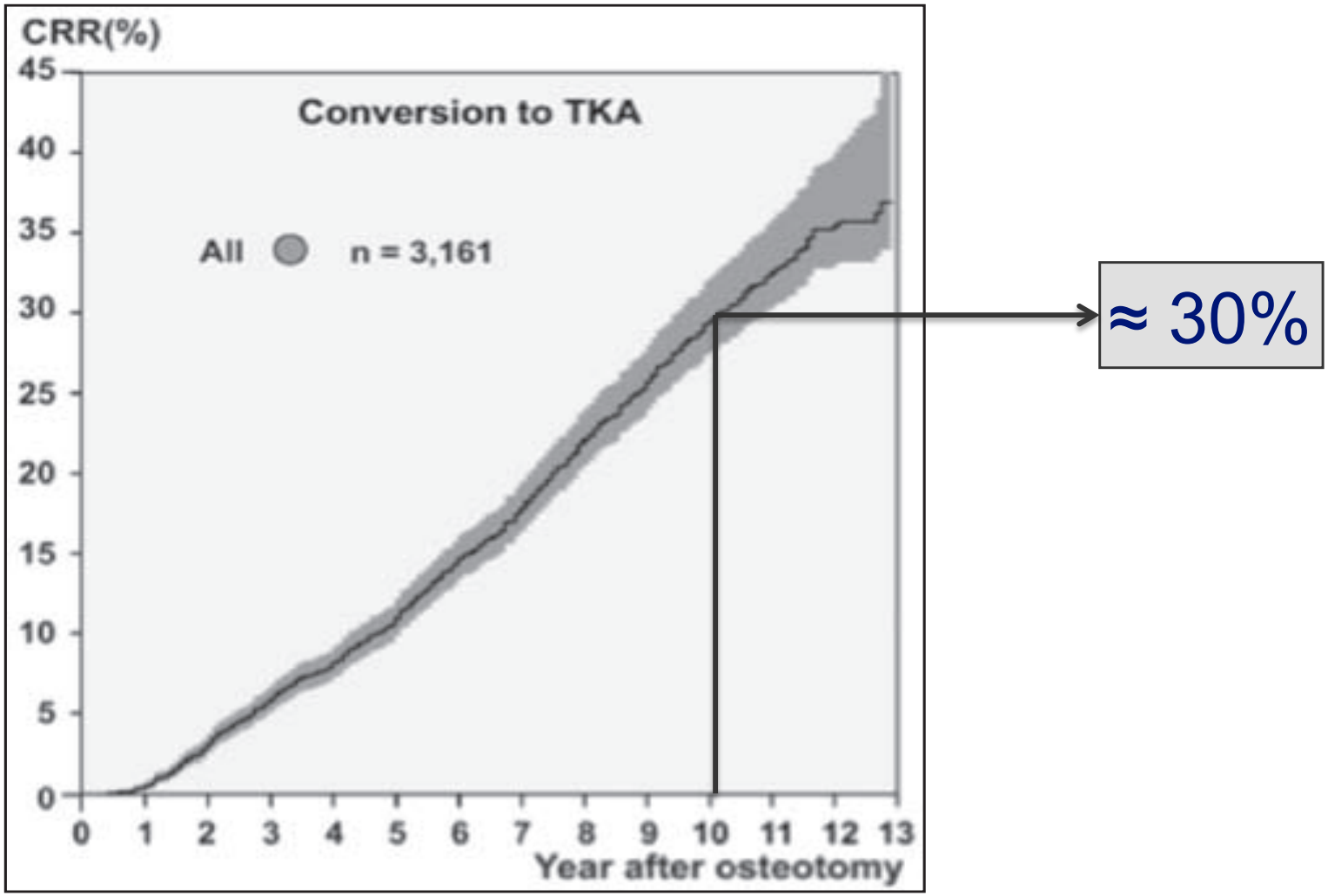


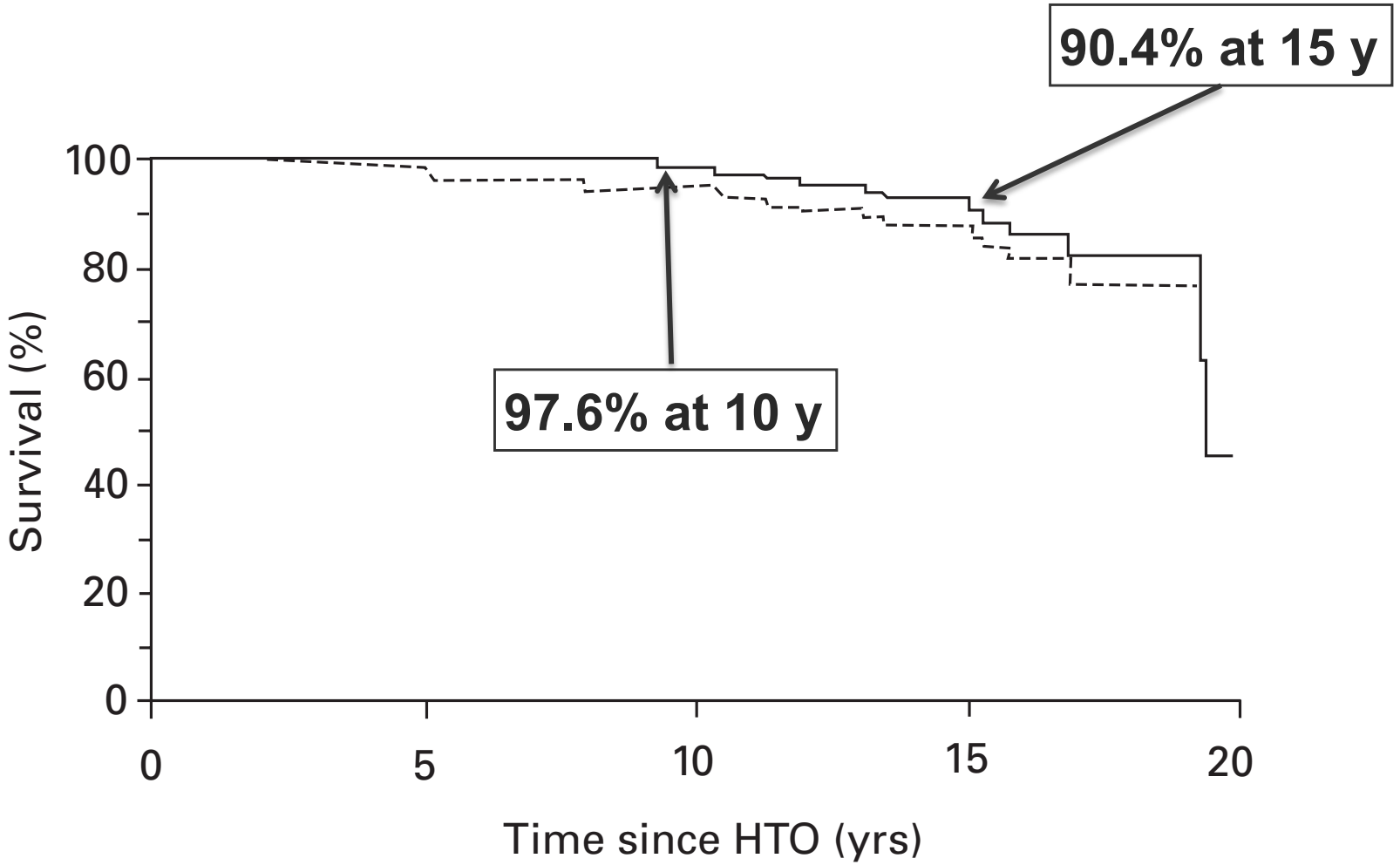

***Fig. 3: Cumulative revision rate (CRR) for high tibial osteotomy (HTO) (W-Dahl et al. 2012).***

S. Akizuki,
A. Shibakawa,
T. Takizawa,
I. Yamazaki,
H. Horiuchi

*From Nagano Matsushiro General Hospital, Nagano City, Japan*

# The long-term outcome of high tibial osteotomy

## A TEN- TO 20-YEAR FOLLOW-UP



# Outcomes of UKA and HTO

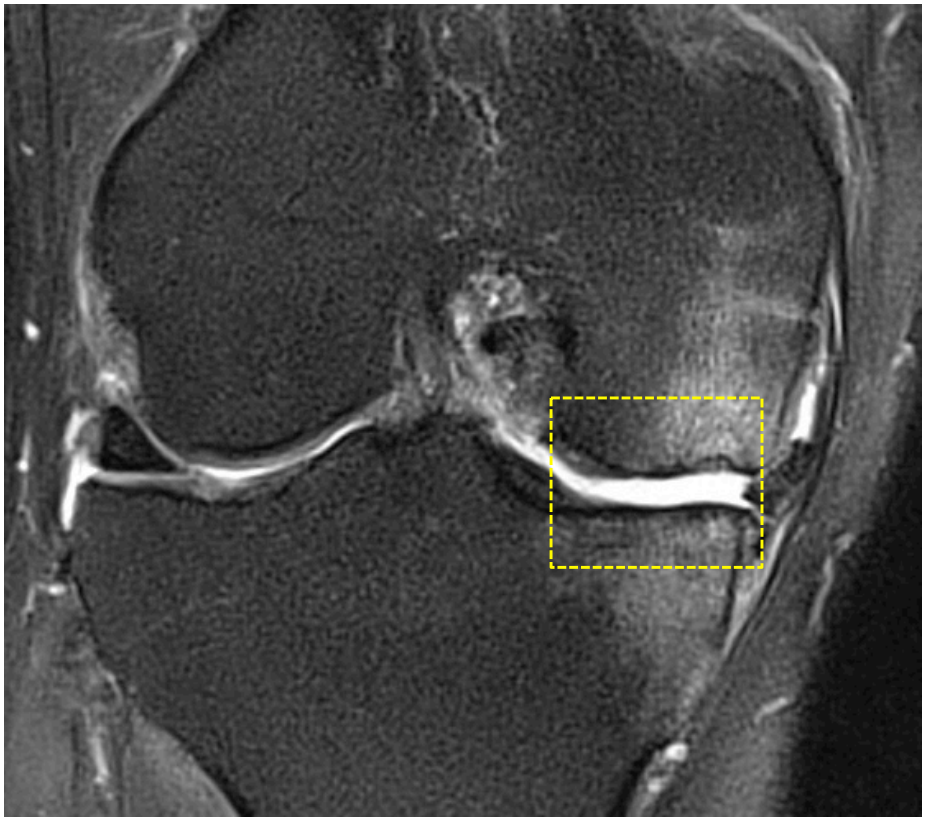
- Surgical technique
- Patient selection
- Implant design

# Patient selection

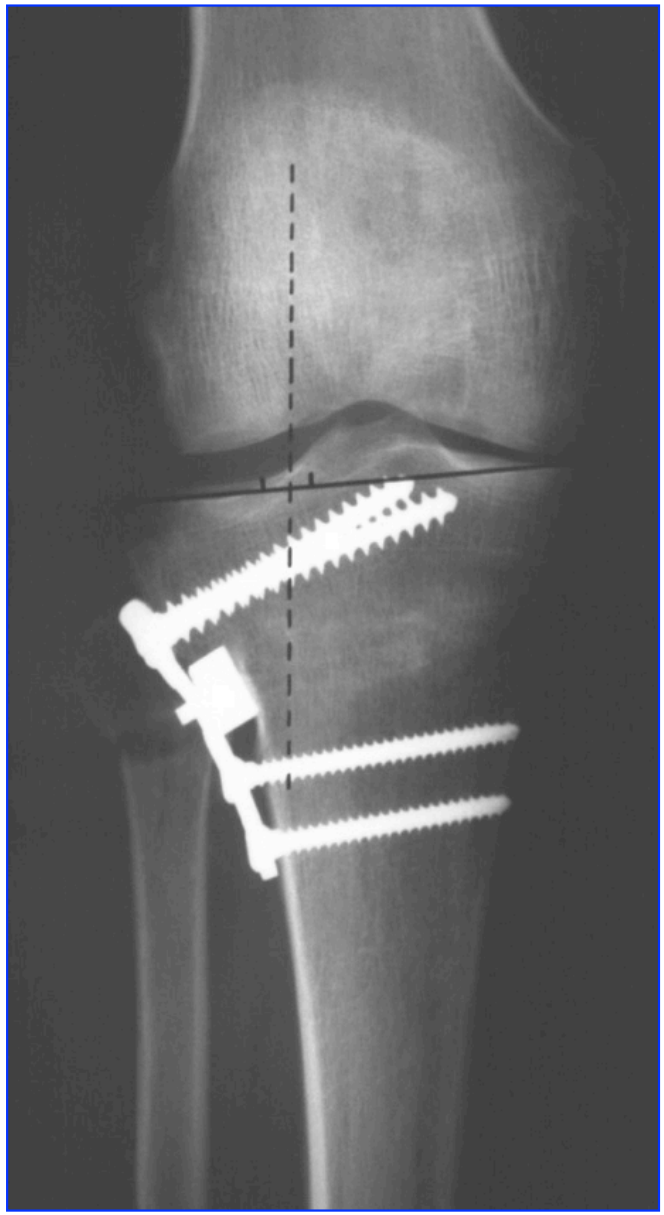
- Weight
- ACL
- Patello-Femoral joint
- Controlateral compartment
- Bone quality
- Basic alignment

# UKA: corrects exclusively the **intra@ defect**

*Cannot modify any extra@deformity*



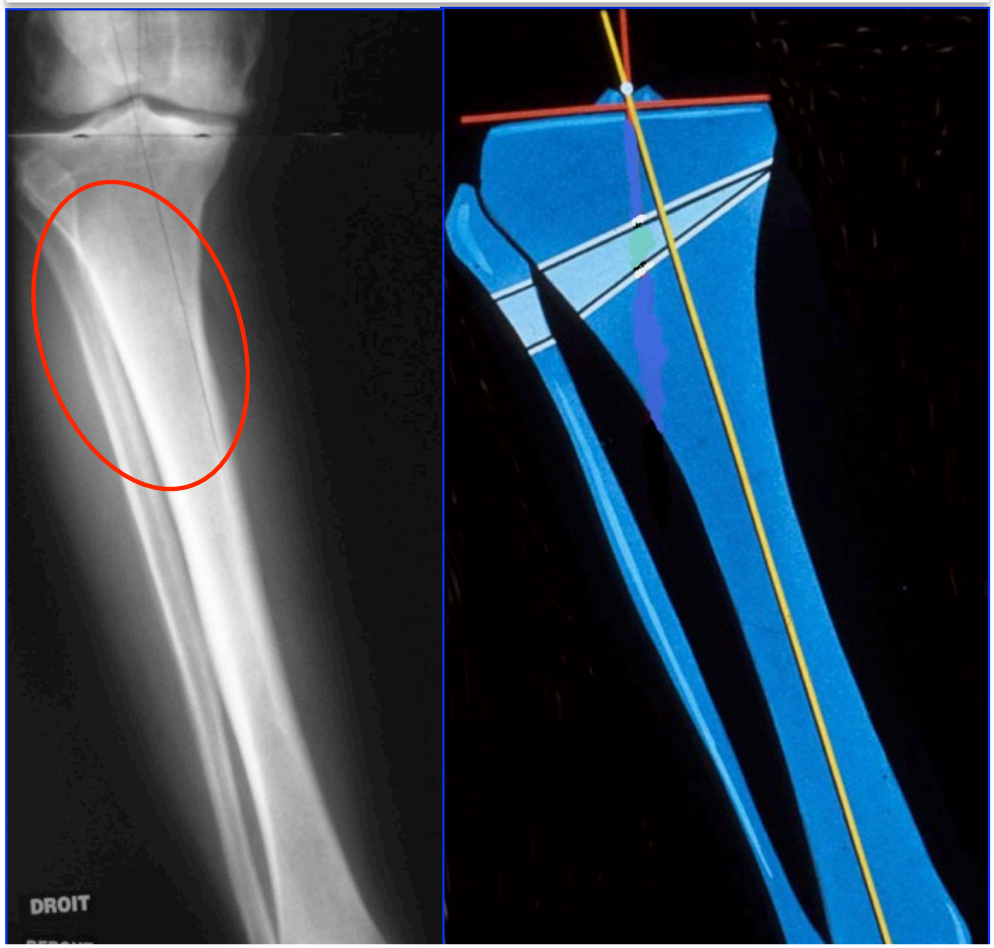
# HTO: corrects exclusively the **extra@ deformity**



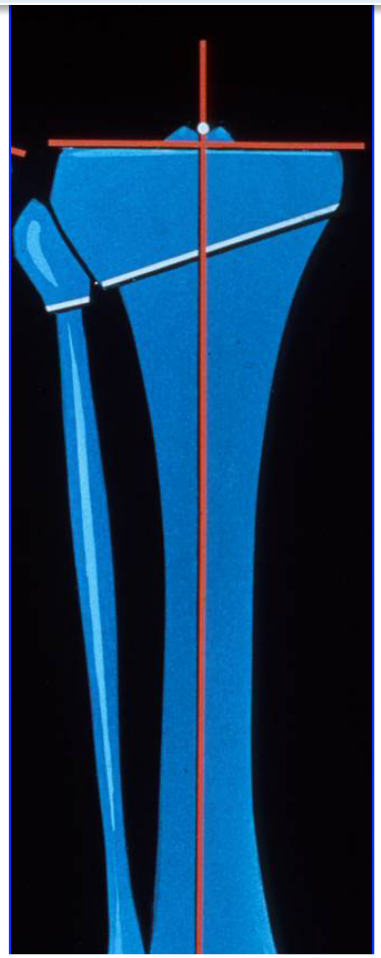
# Medial OA

**Key:** analyze the etiology of the varus deformity

Bone deformity (tibia varus)



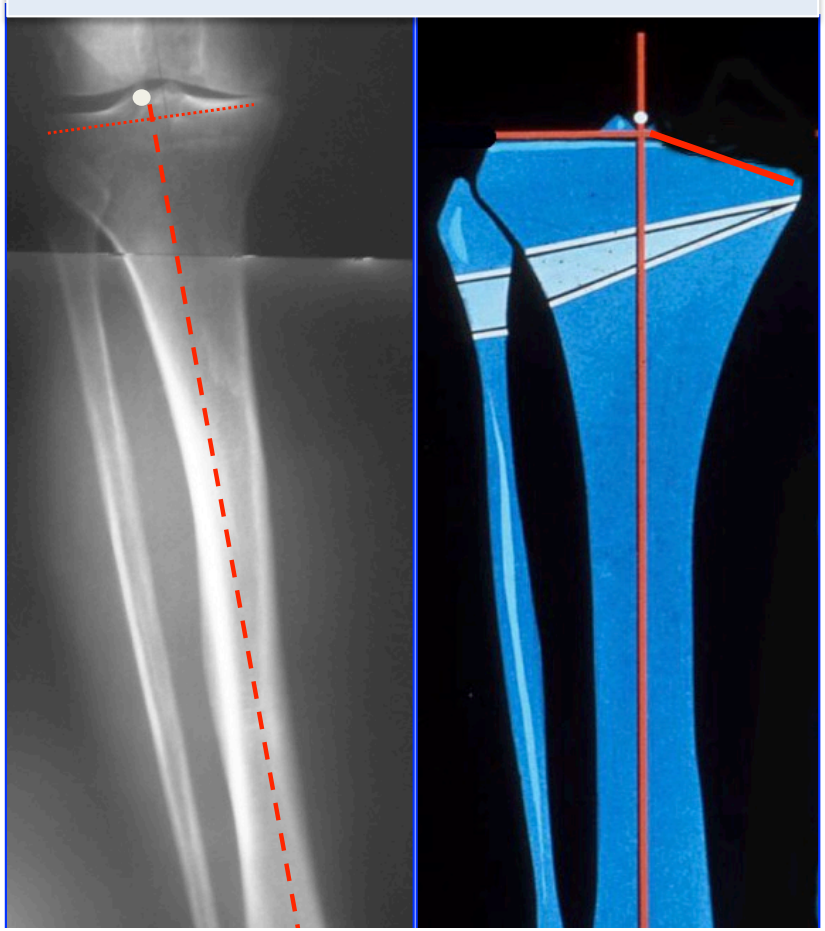

Corrective HTO



**HTO: Good Result**

**Key:** analyze the etiology of the varus deformity

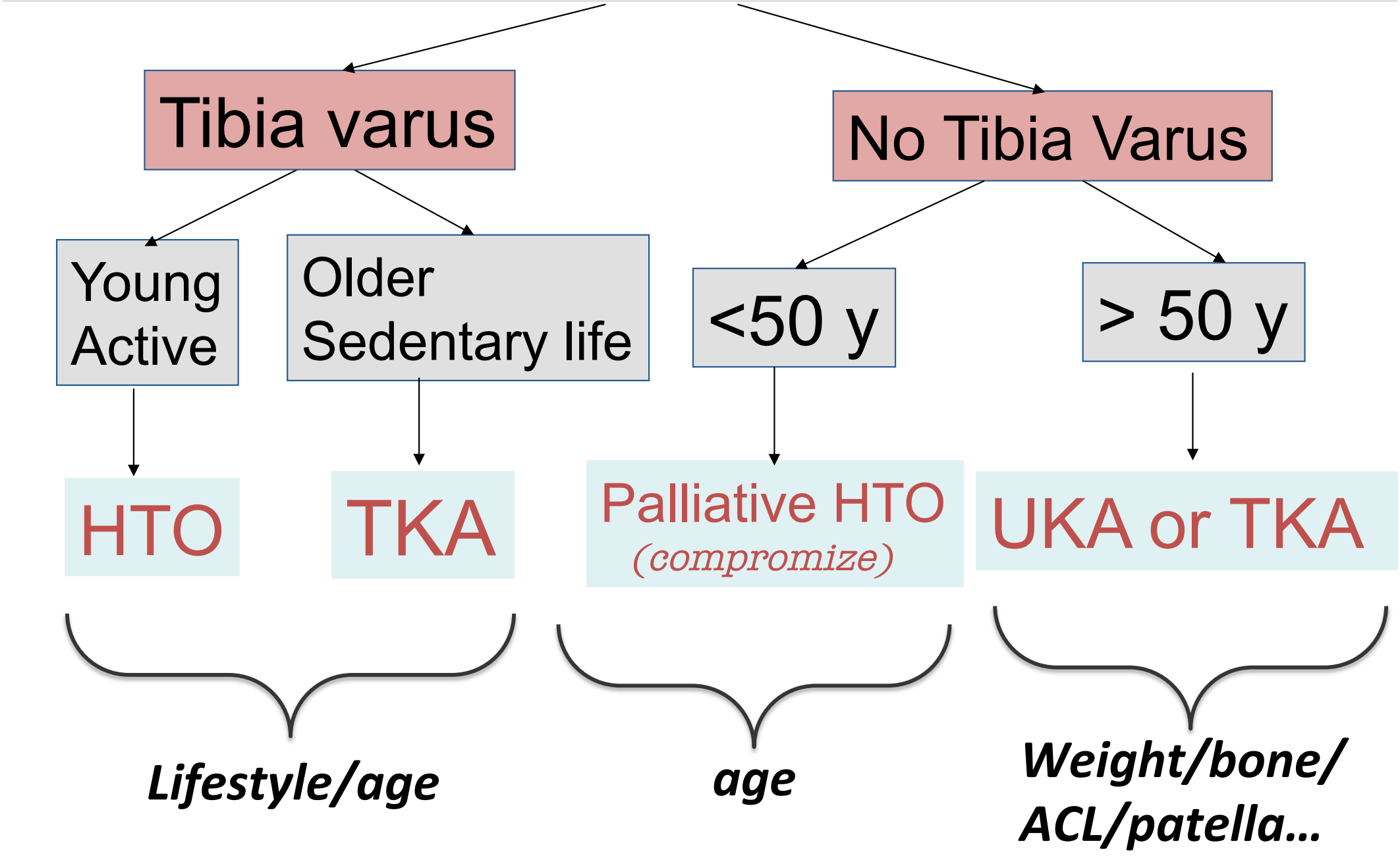
Joint deformity (tibial wear)



Palliative HTO

**HTO: Bad Result**

# Medial OA


Tibia varus
No Tibia Varus
Young Active
Older Sedentary life
<50 y
> 50 y
HTO
TKA
Palliative HTO
(compromize)
UKA or TKA
Lifestyle/age
age
Weight/bone/ ACL/patella…

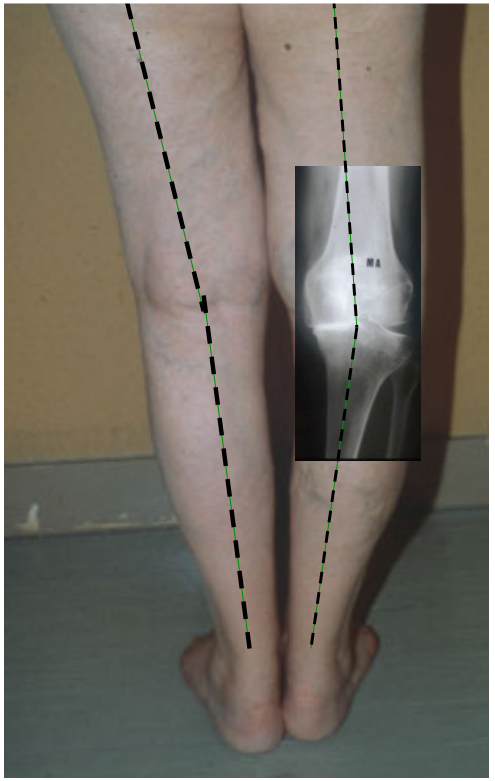
# How can we know the native alignment??

- ☐ History of the patient
- ☐ Contro-lateral limb
- ☐ Alignment in decubitus
- ☐ Long leg-XR
- ☐ Stress-XR

# ☑ CLINICAL EXAM

Varus
= Tibial deformity

Varus = Wear



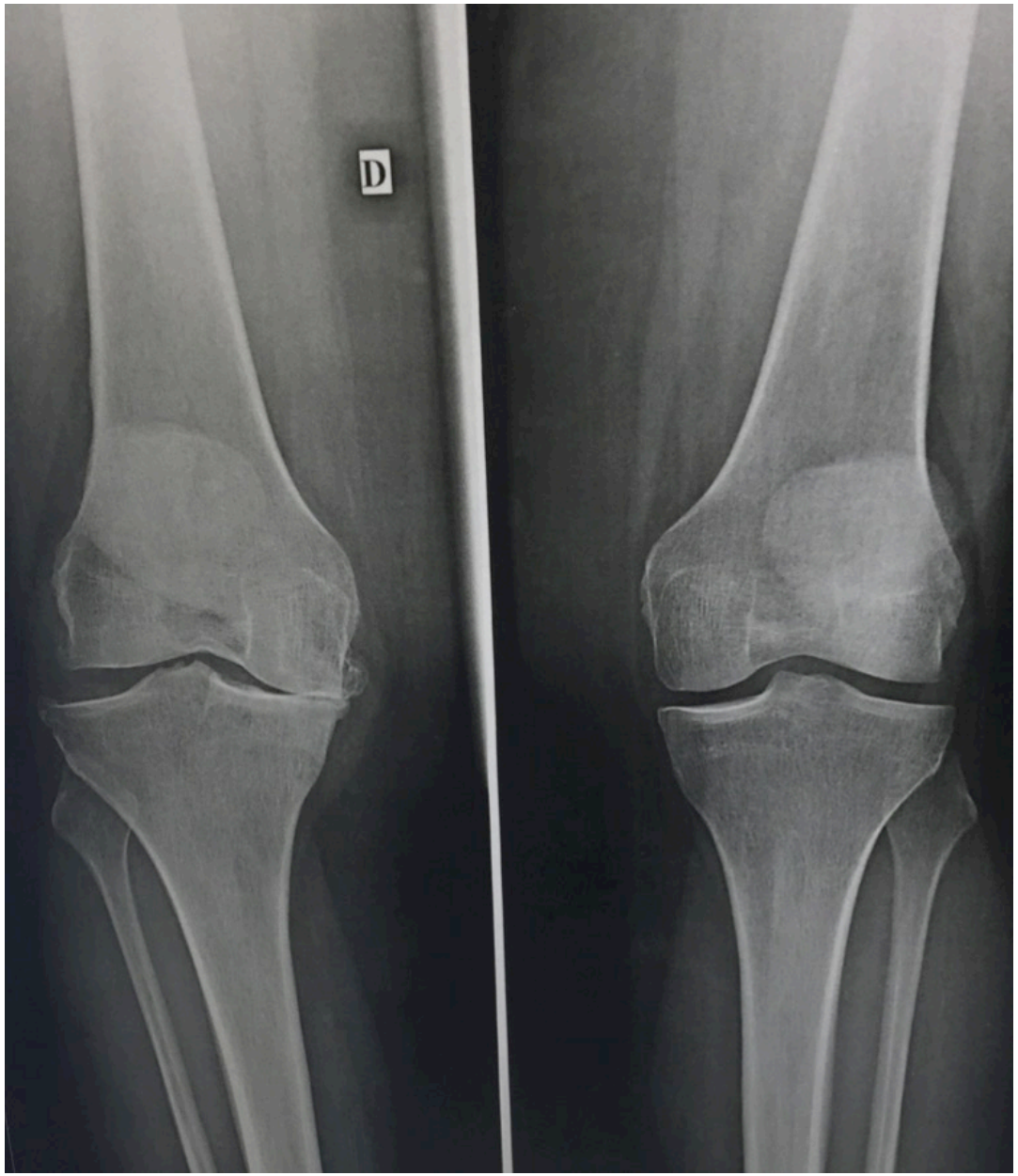
**HTO: Good Result**

**UKA: Bad Result** nd lying

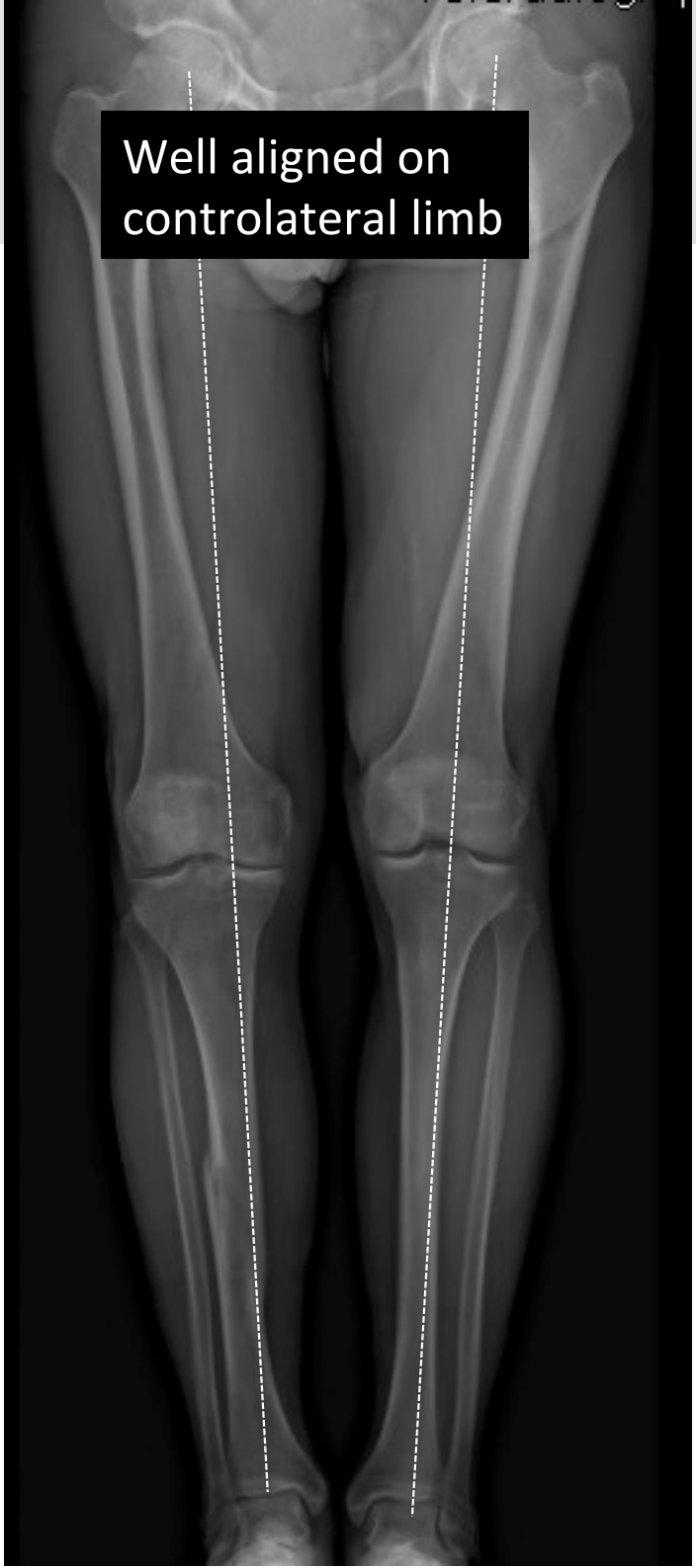
**HTO: Bad Result** th

**UKA: Good Result**

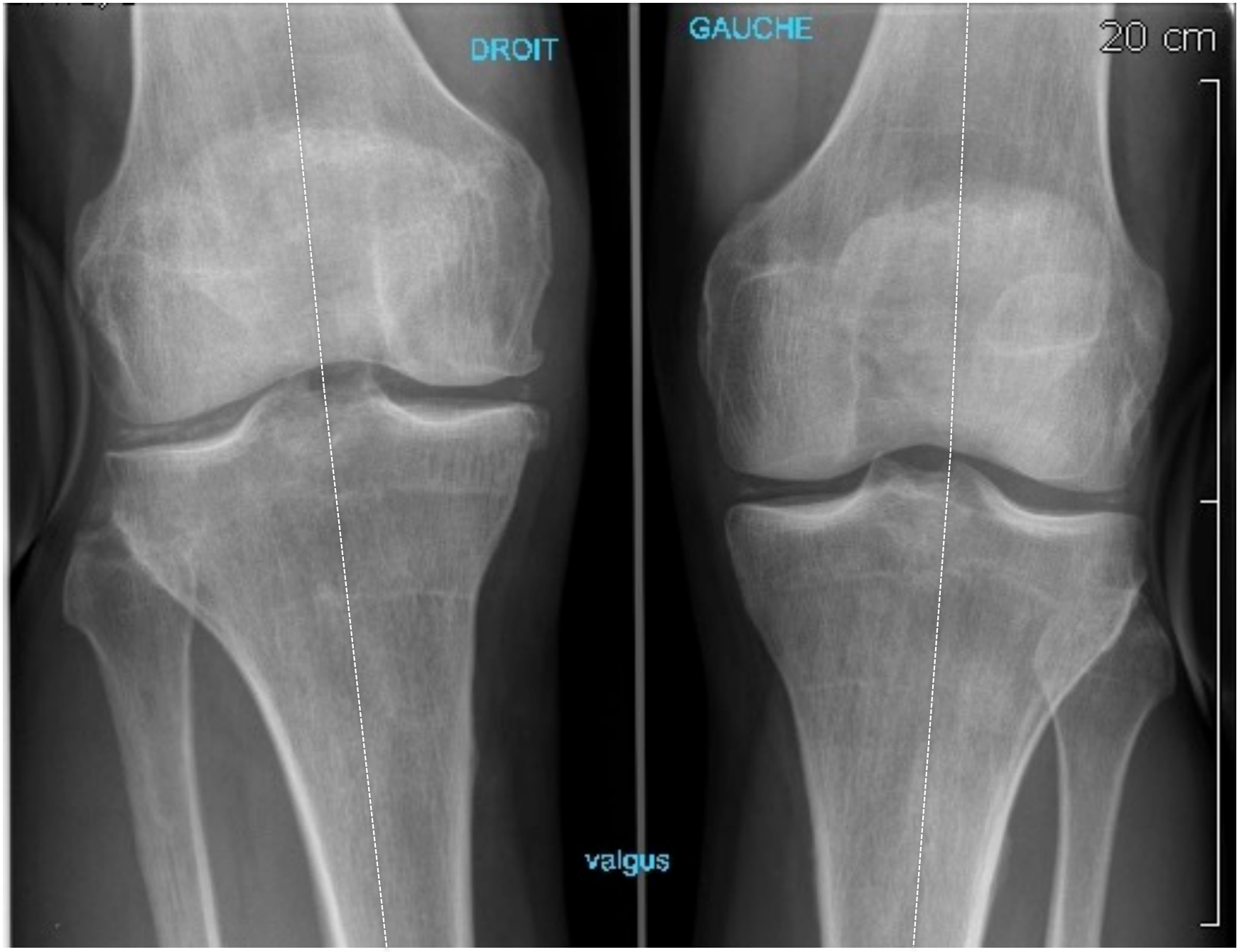
# ☑ Clinical exam



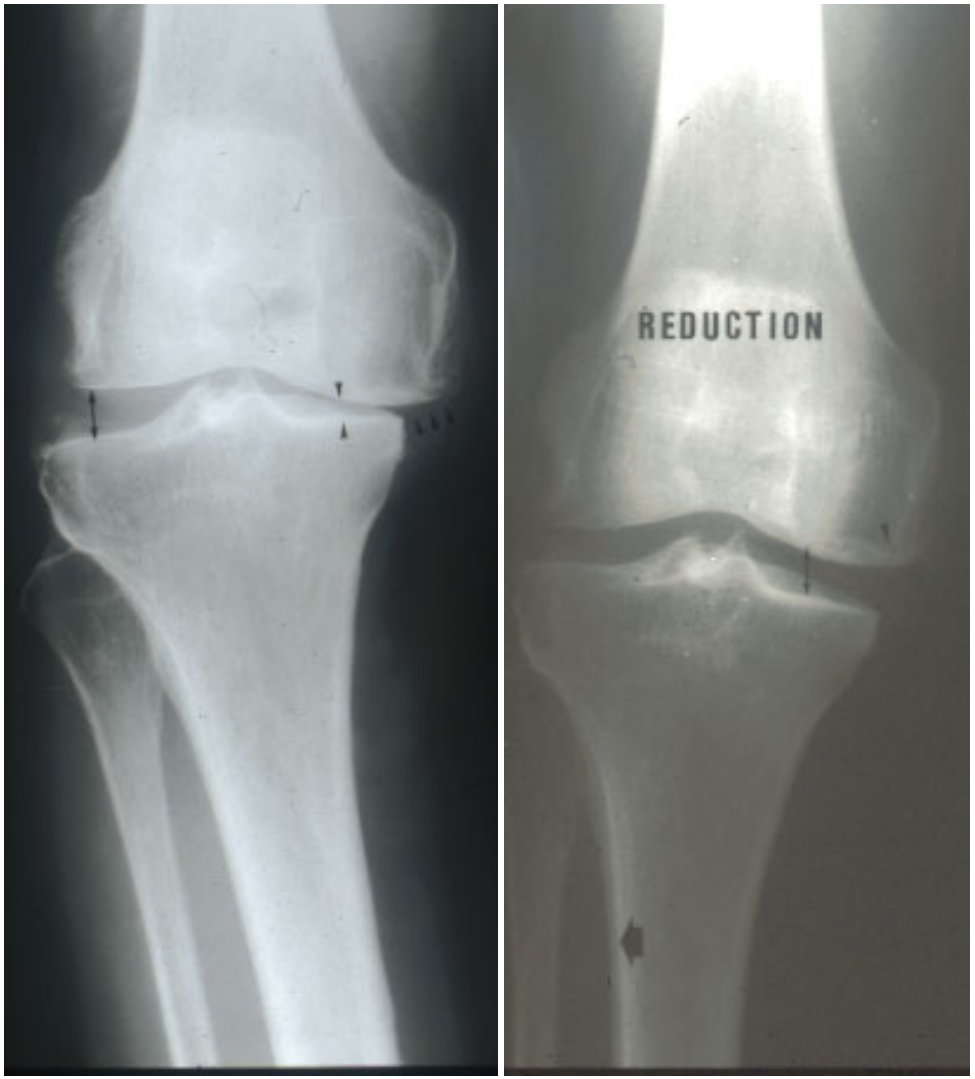

# ☑ LONG LEG XR

# ☑ STRESS XR



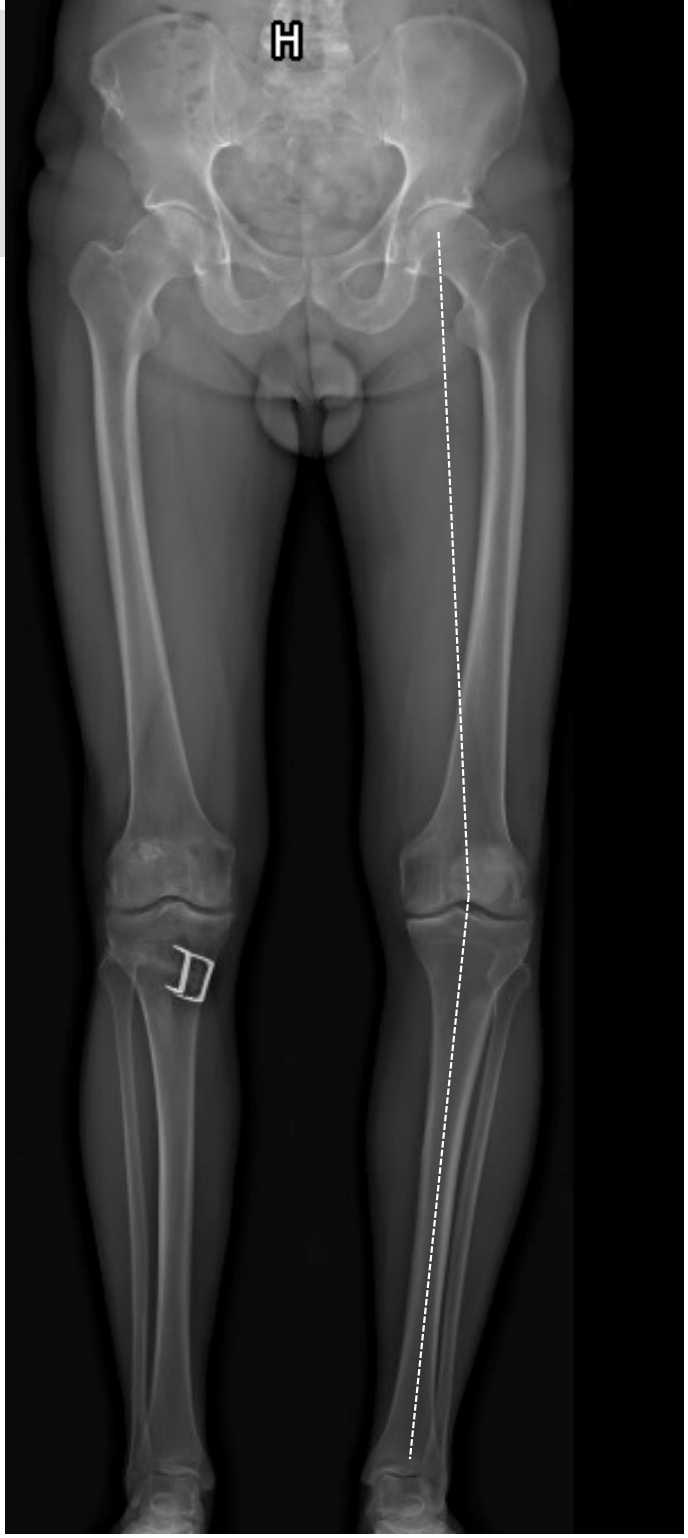
# ☑ STRESS XR




# exemples

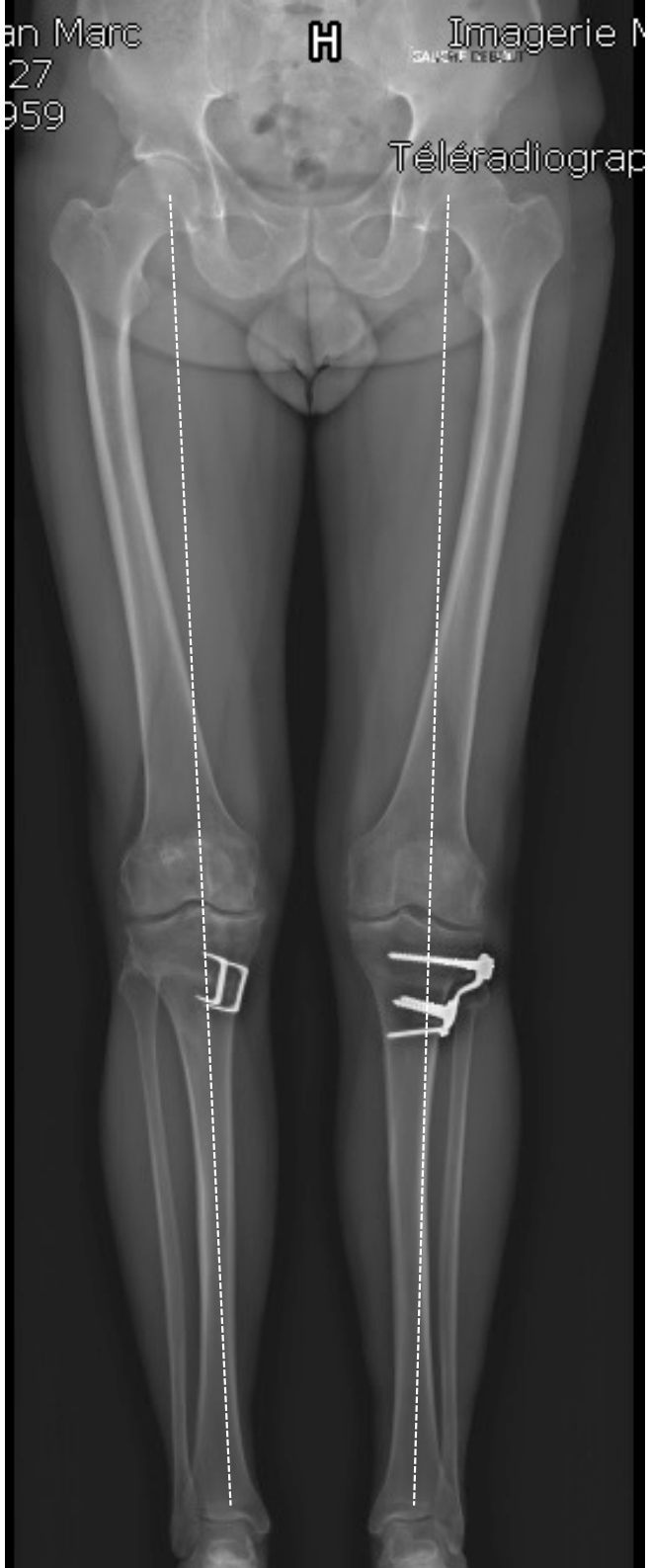
# 1- Medial OA tibia varus

***57y - judoka- HTO+ ACL right 20 y ago***

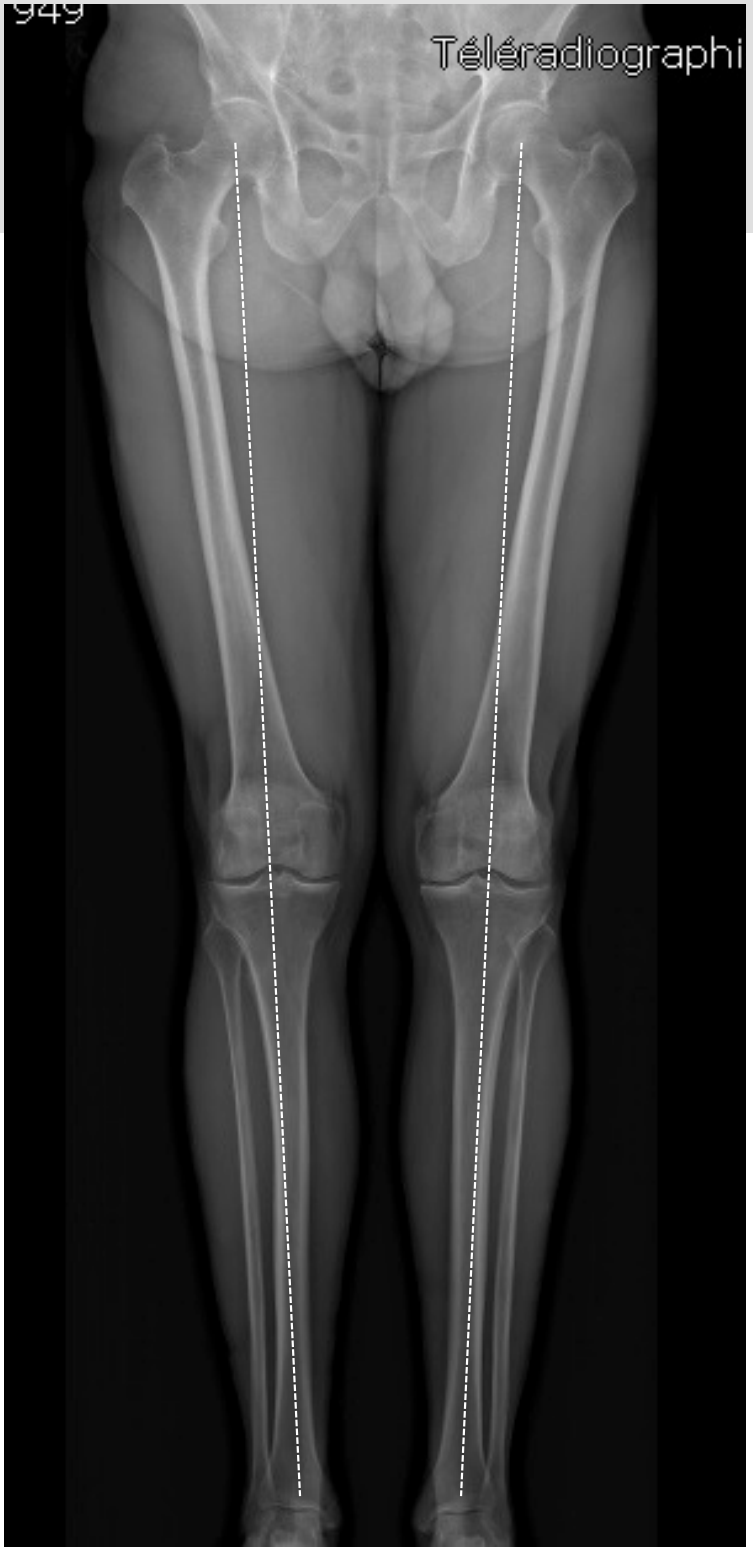

GAUCHE

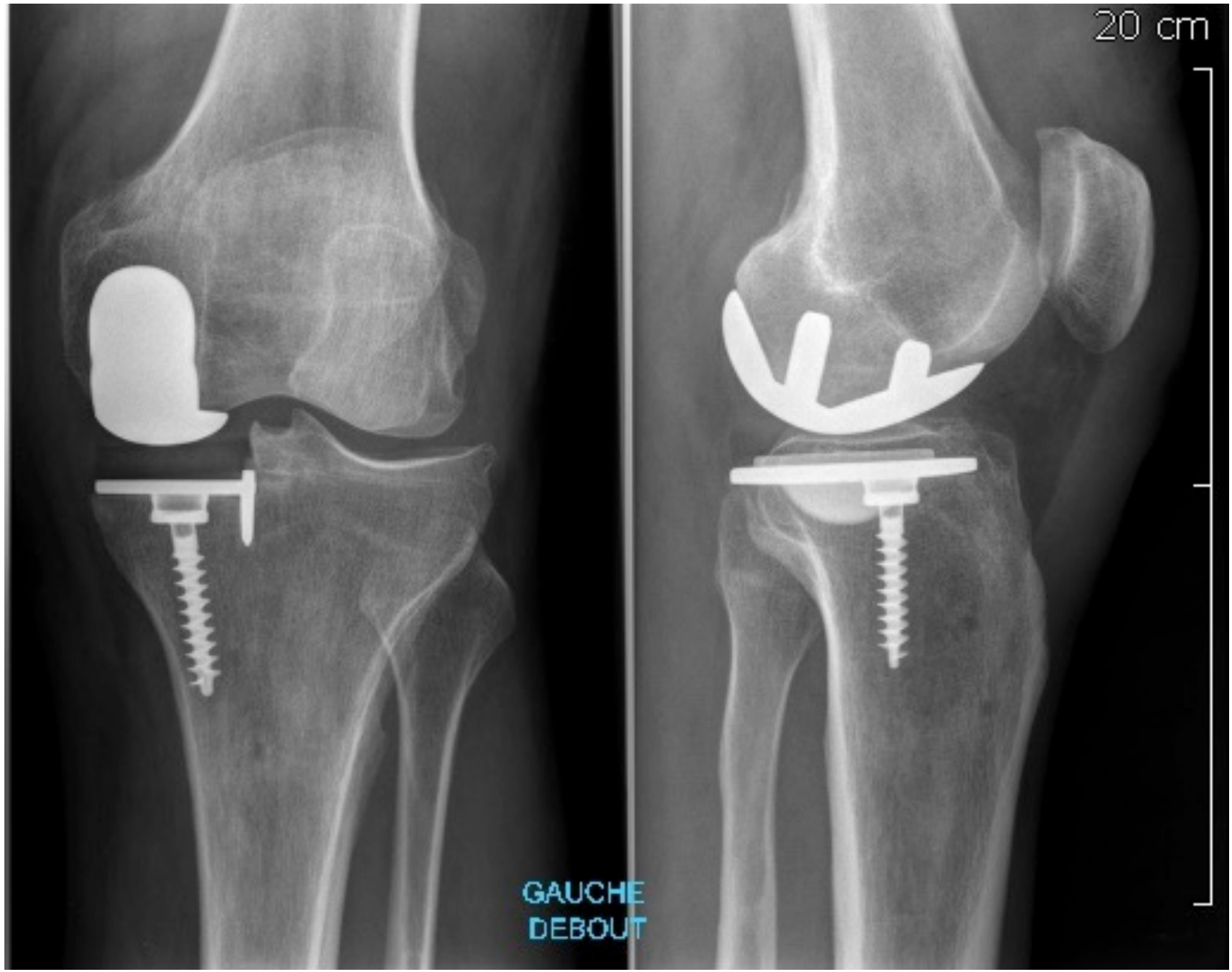

GAUCHE


H
Imagerie
Téléradiograp

# 2- Medial OA no tibia varus

***Born 1949 - Running***

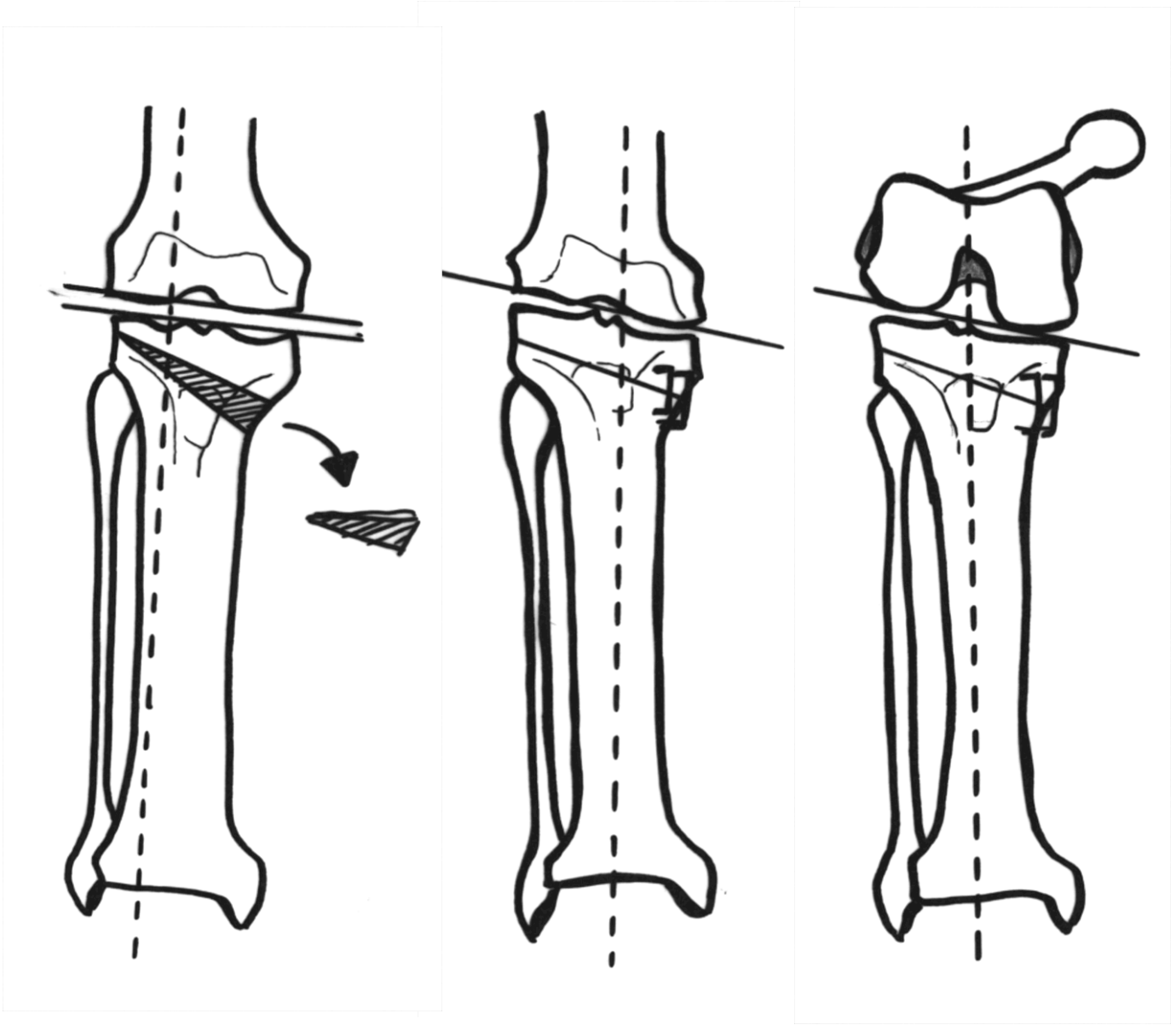

20 cm
GAUCHE
DEBOUT

# Lateral OA

# Tibial varus osteotomy

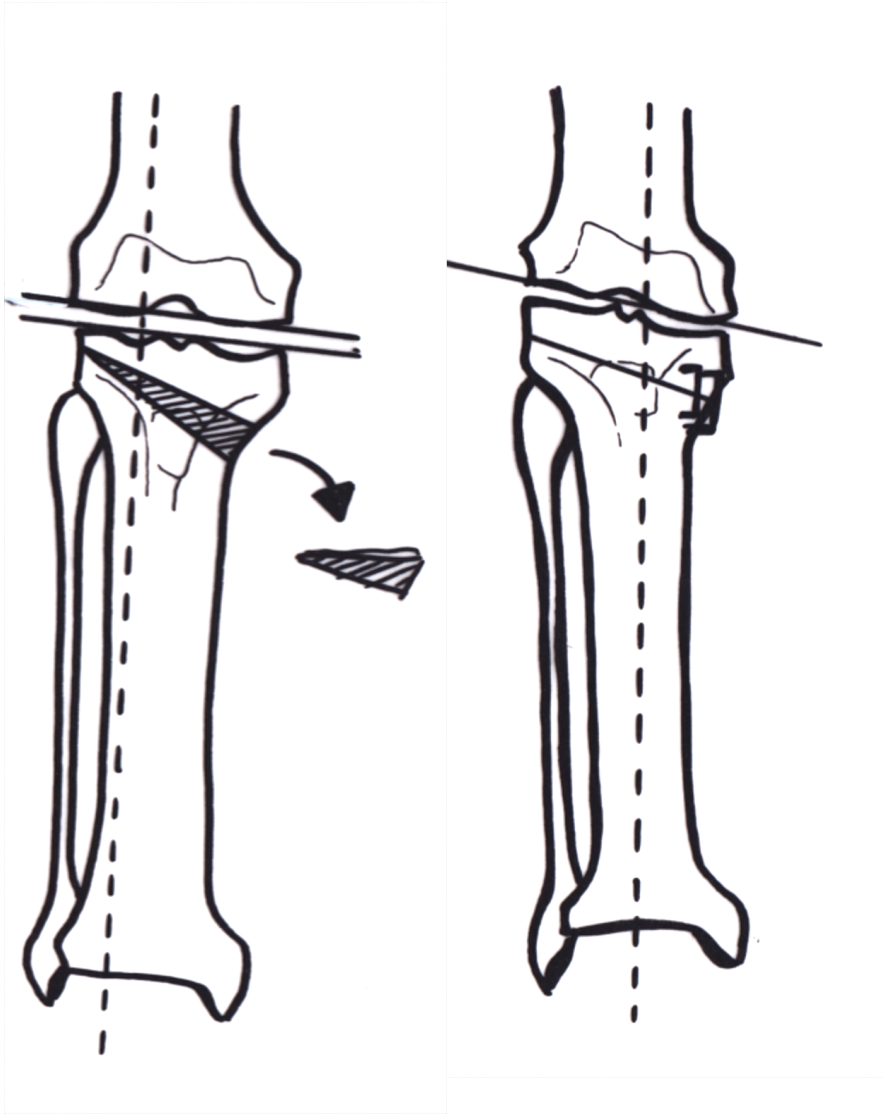
# Tibial varus osteotomy

- Technically easy
- Good bone healing
- Efficient at mid-flexion



# Disdvantages

- Valgus deformity on the femur
- Risk of oblique joint line
- Create a deformity
- Risk of over correction



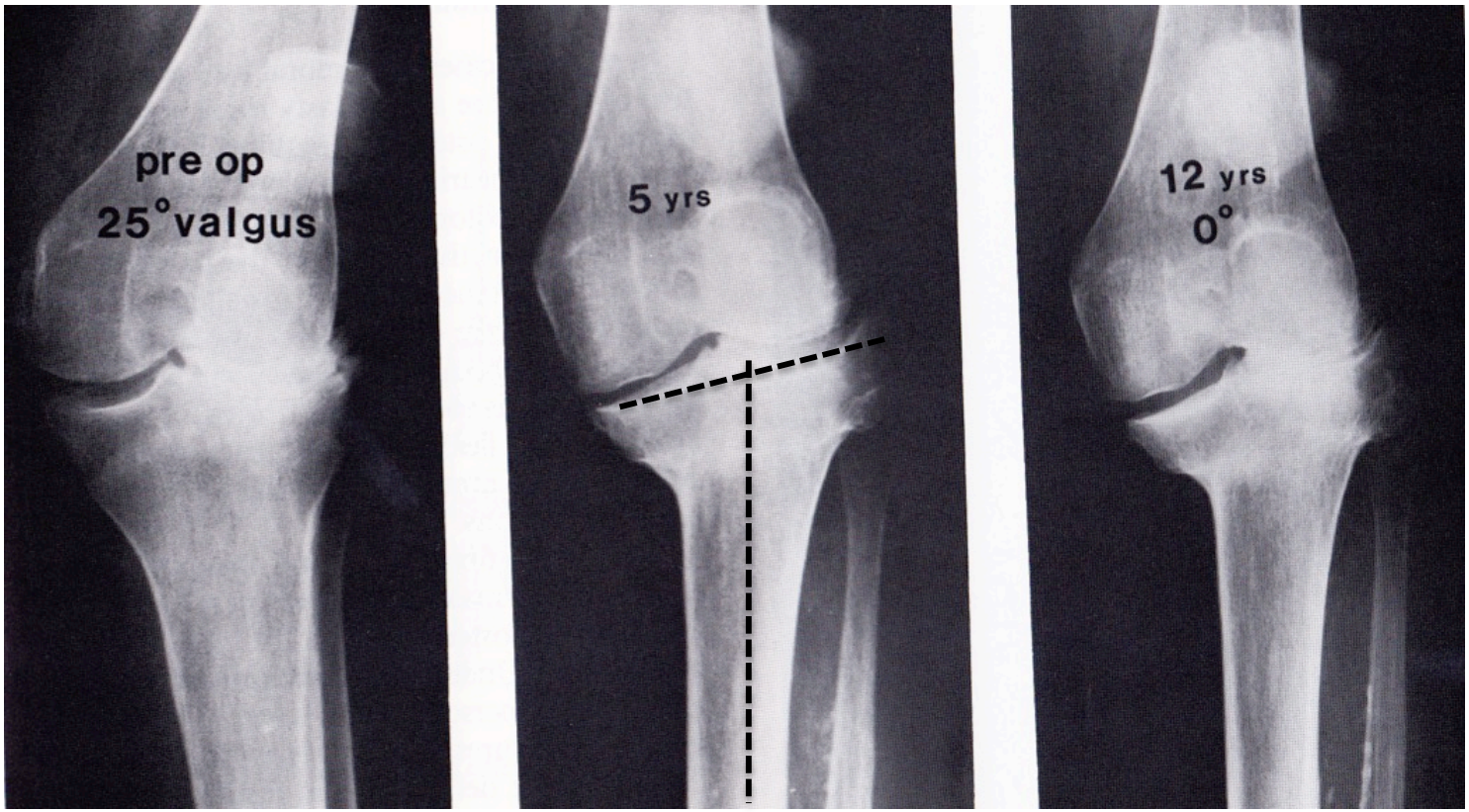
# Closing-wedge osteotomy: *1973*

- 49 patients
- FU = 31 months
- 13 to 69 months

## High Tibial Osteotomy for Osteoarthritis of the Knee with Valgus Deformity

BY HIROMU SHOJI, M.D.*, WINSTON-SALEM, NORTH CAROLINA, AND JOHN INSALL, M.D.†, NEW YORK, N.Y.

*From the Hospital for Special Surgery, New York*



# Coventry *JBJS Am 1987*

Proximal Tibial Varus Osteotomy for Osteoarthritis of the Lateral Compartment of the Knee*

BY MARK B. COVENTRY, M.D.†, ROCHESTER, MINNESOTA

*From the Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester*

- 31 osteotomies in 28 patients
- FU: 9 years (2 to 17)

# Henry Dejour: *Journées Lyonnaises 1991*

***Chambat et al. Operative Techniques in Sports Medicine 2000***

- 47 patients
- Mean FU: 7 years

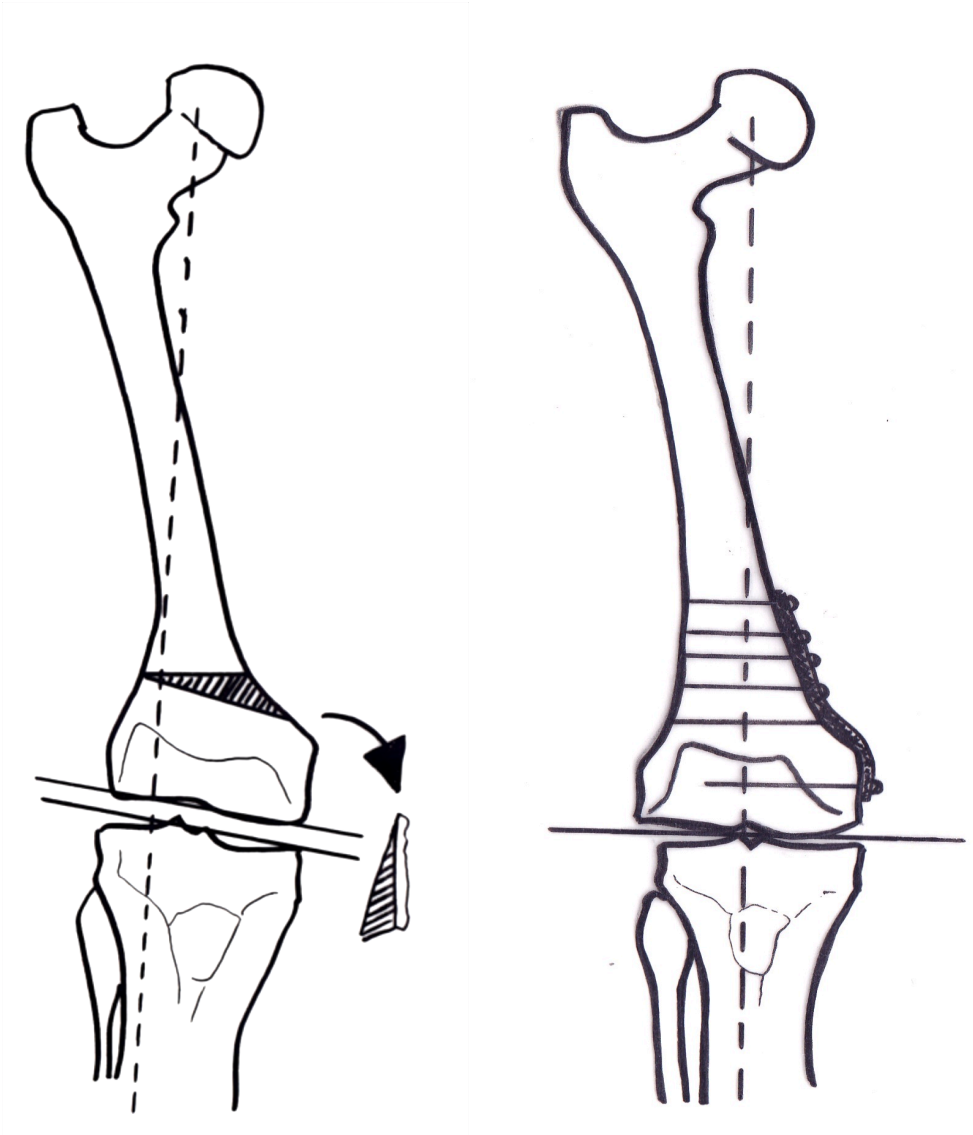
# The rules of Tibial varus osteotomy

1. Never Overcorrect
2. JL obliquity ≤ 10°
3. Stable knee
4. Localised narrowing
5. Young age (<60 y)

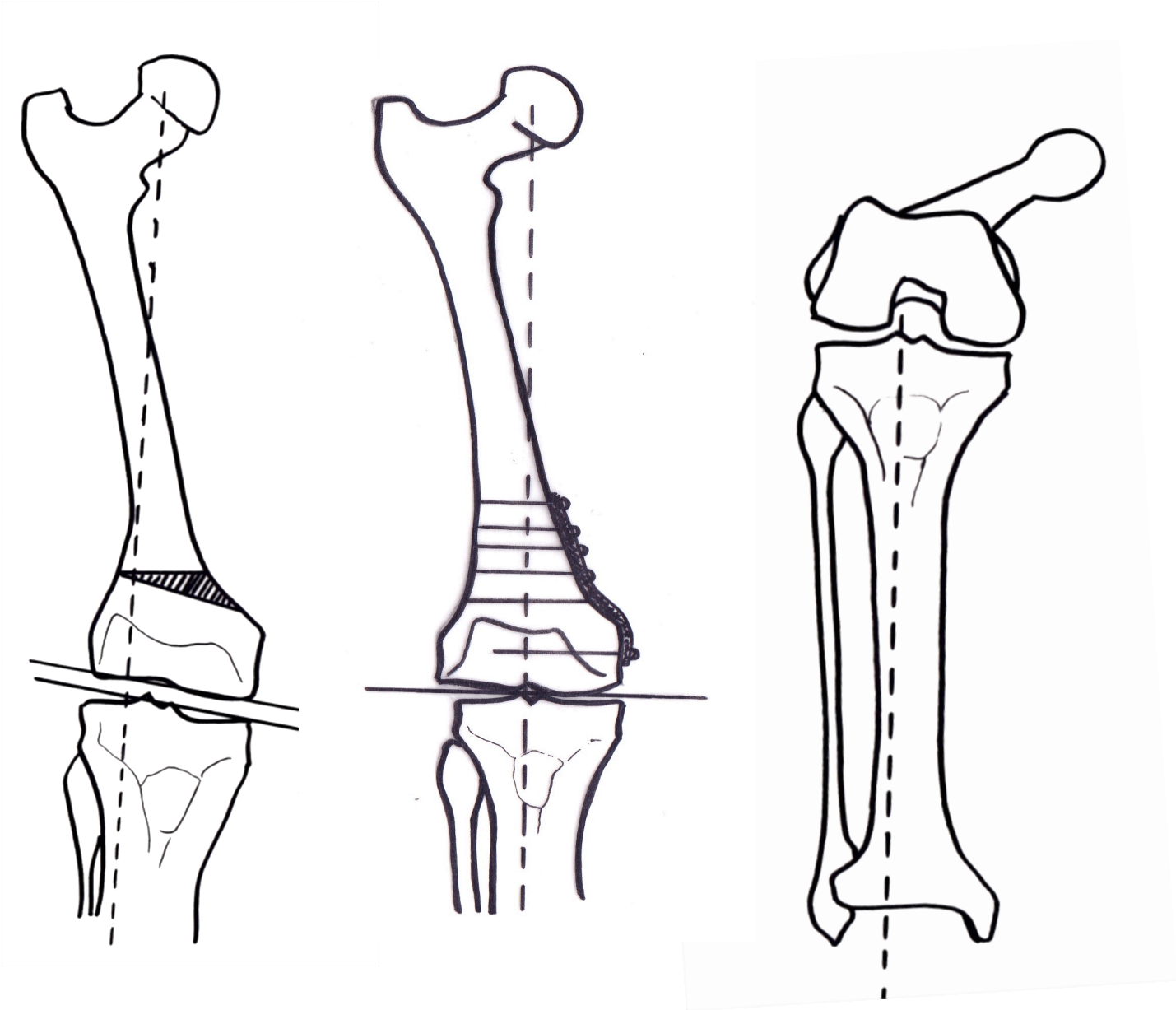
# Femur varus osteotomy

# Femur varus osteotomy

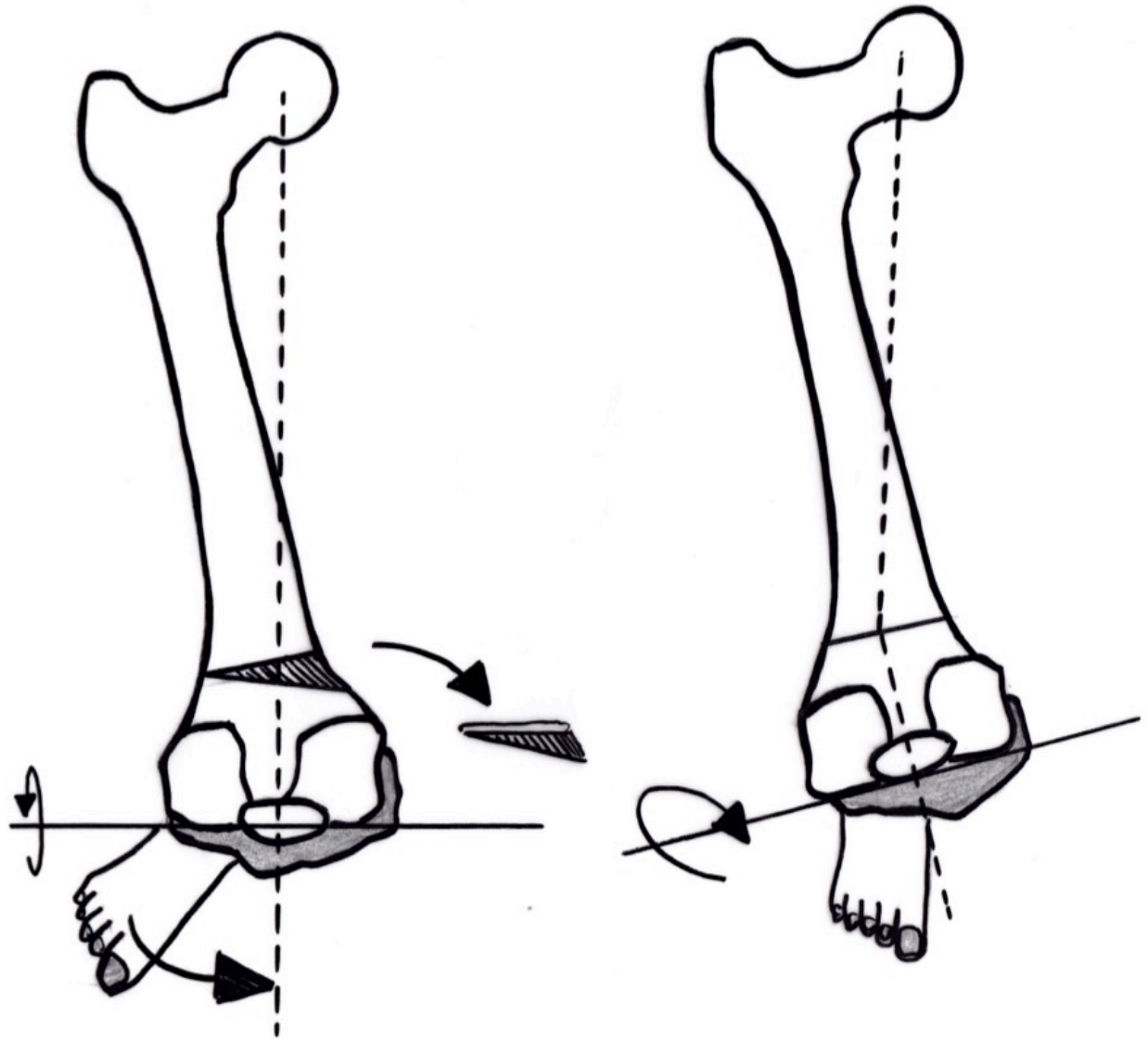
- Valgus coronal deformity
- No JL obliquity



# DFO: no correction of posterior hypoplasia



# DFO: no correction of posterior hypoplasia



# Femoral osteotomy: Closing vs open-wedge?

# Distal femoral osteotomy: results

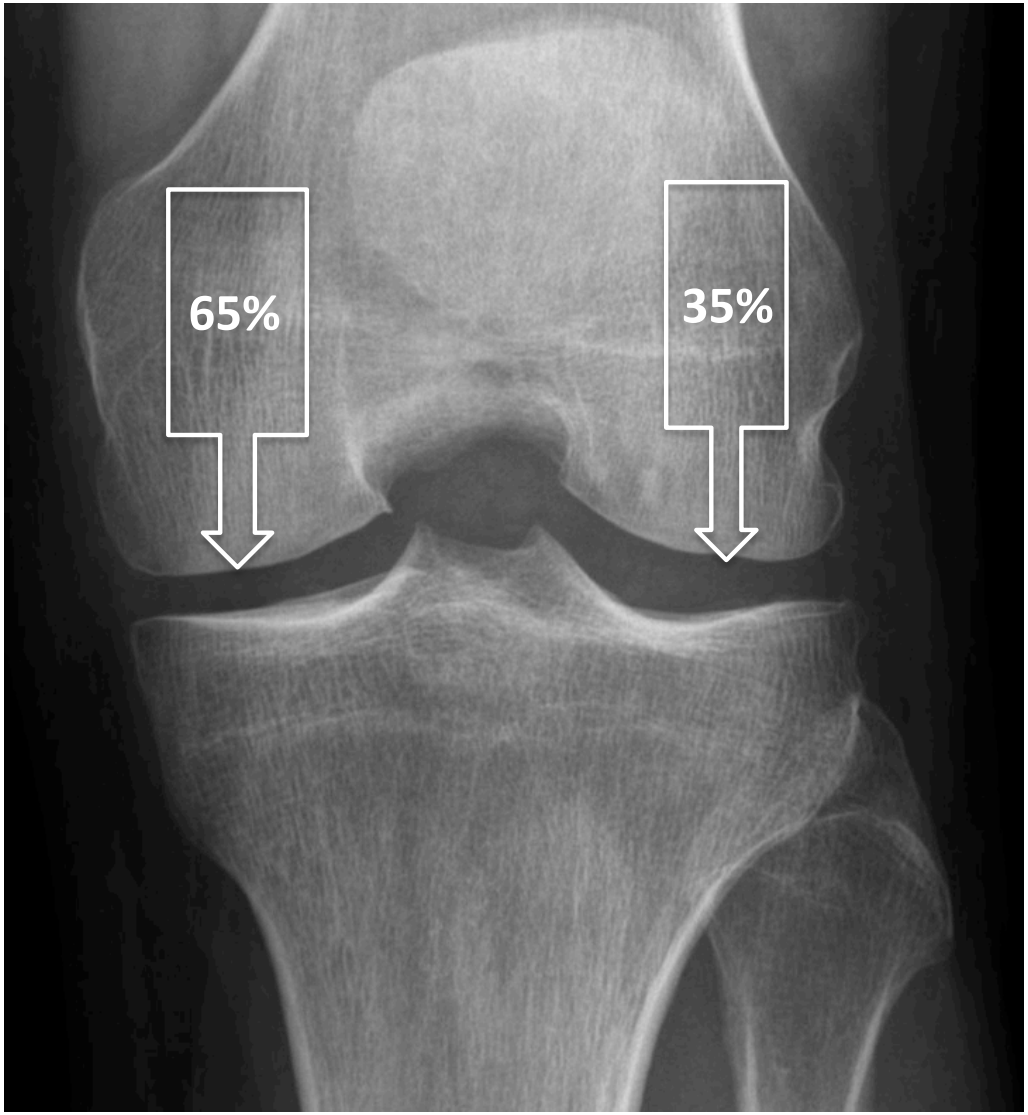
| author | ref | n | Technique |
|---|---|---|---|
| **1-Healy** | JBJS 1988 | 23 | Closing wedge |
| **2-McDermott** | JBJS 1988 | 24 | Closing wedge |
| **3-Terry** | Orthopedics 1991 | 36 | Closing wedge |
| **4-Edgerton** | CORR 1993 | 23 | Closing wedge |
| **5-Mathews** | Orthopedics 1998 | 21 | Closing wedge |
| **6-Finkelstein** | JBJS 1996 | 21 | Closing wedge |
| **7-Wang** | JBJS 2005 | 30 | Closing wedge |
| **8-Backstein** | JoA 2007 | 40 | Closing wedge |
| **9-Kosashvilli** | Int orthop 2010 | 30 | Closing wedge |
| **10-Sternheim** | Orthopedics 2011 | 45 | Closing wedge |
| **11-Zilber** | Rev Chir Orthop 2004 | 11 | 3 Opening wedge<br>8 Closing wedge |
| **12-Jacobi** | Arch Trauma Surg 2011 | 11 | Opening wedge |

# Lateral UKA

# Specificities of lateral UKA

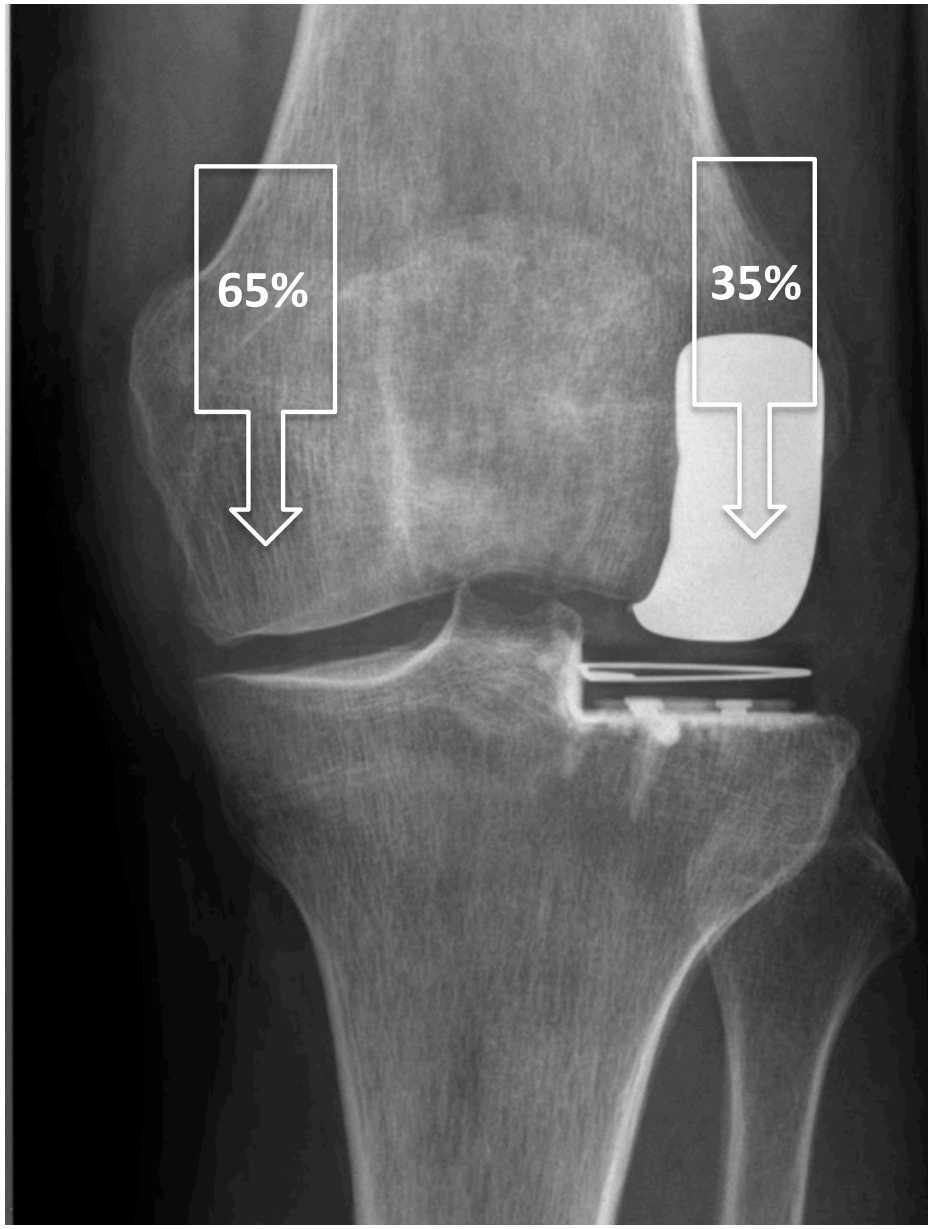
1

# Biomechanics

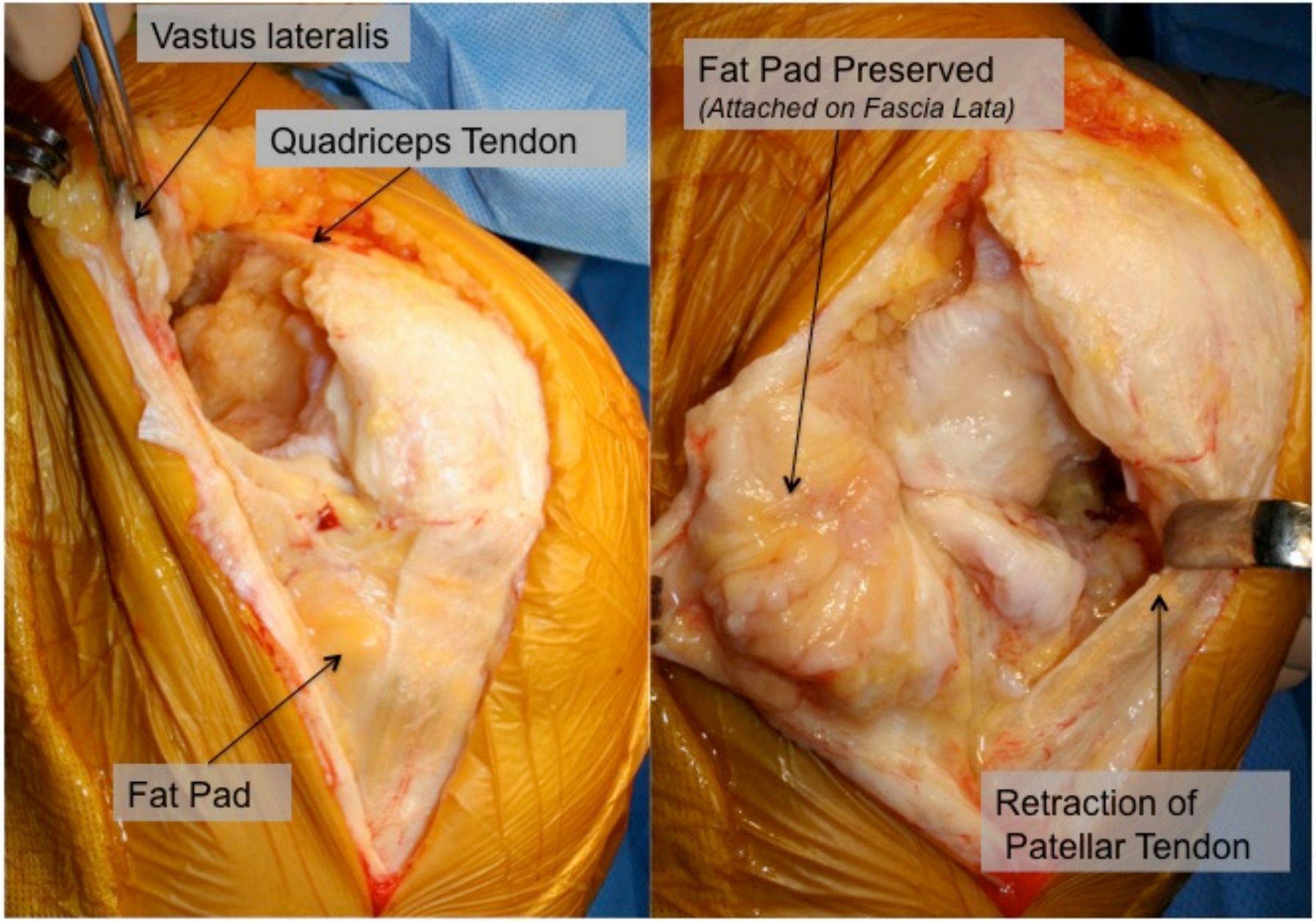


1

# Biomechanics



# 2 Surgical approach: Lateral



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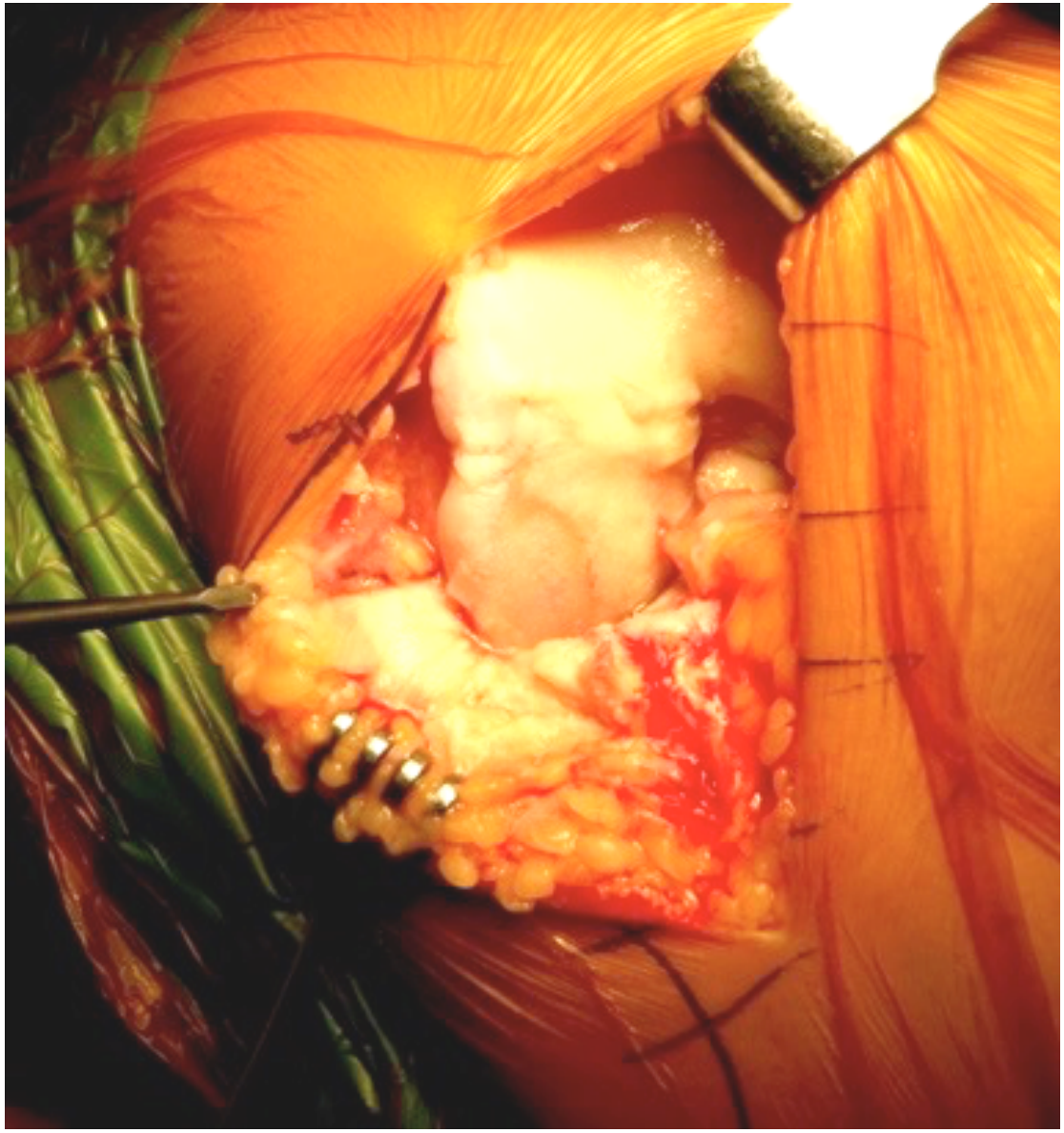
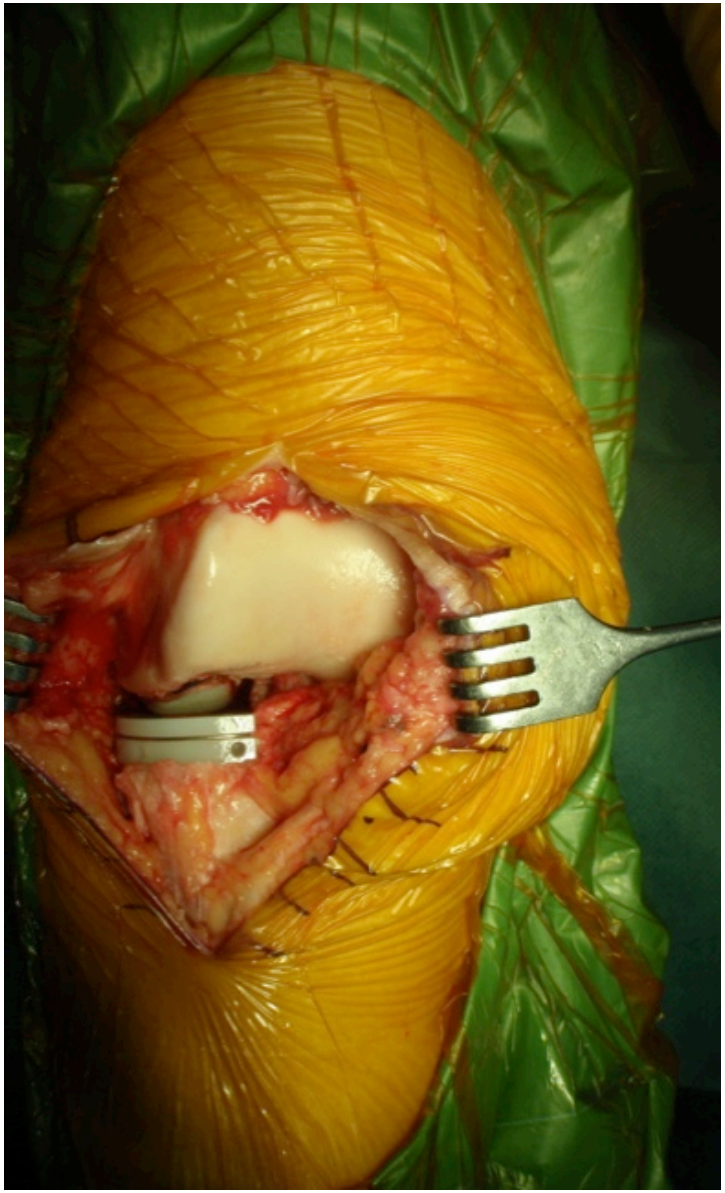




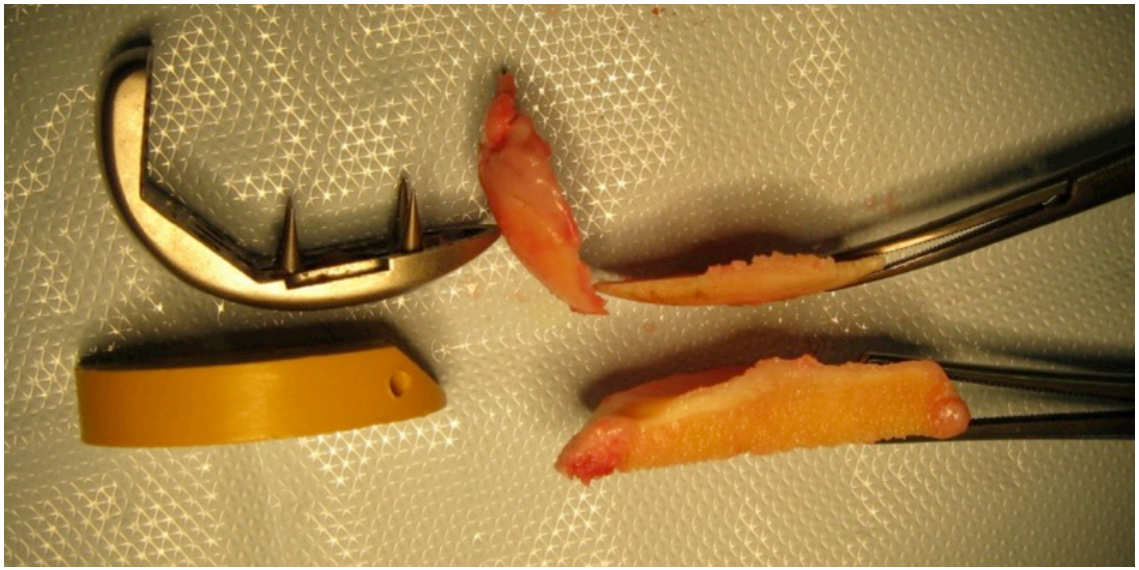
# 3 Higher risk of over-correction


# Over-correction : medial degeneration



# 4 Implants: resurfacing *vs* resection UKA

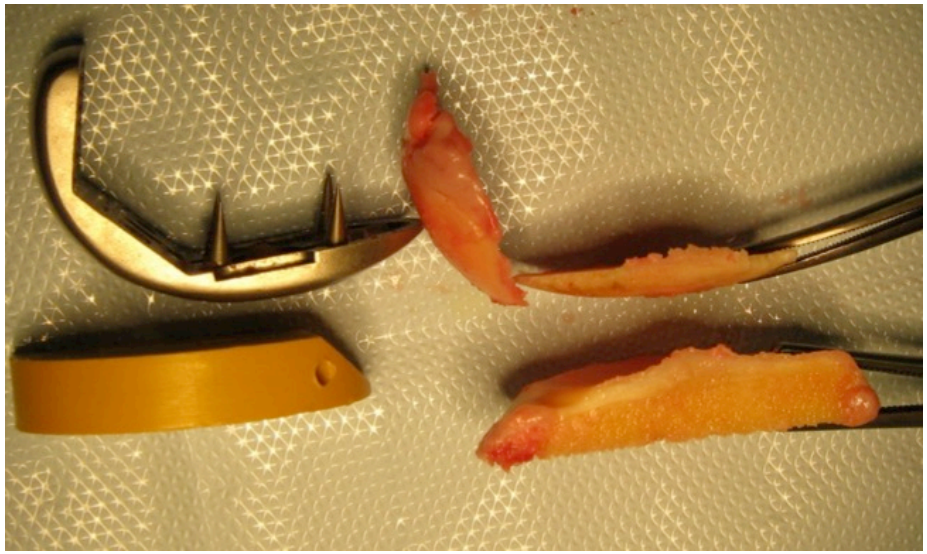
***Resurfacing UNI***



***Resection UNI***

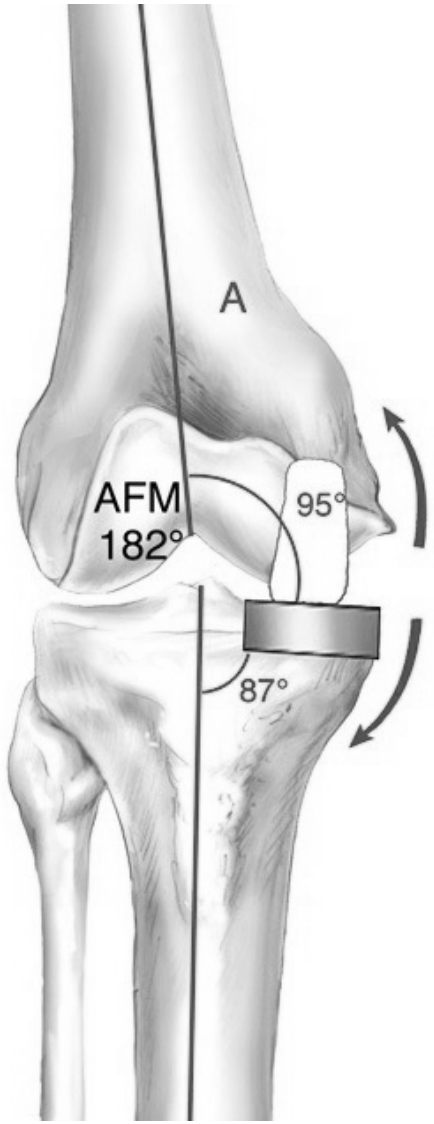
# Resurfacing UKA: distalize the joint-line

# Resection UKA: proximalize the joint-line

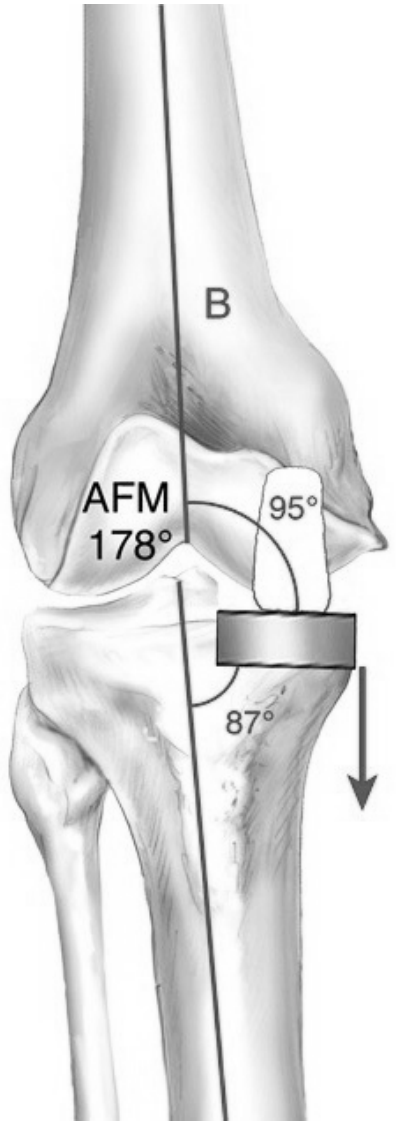


# Distalization of the joint line

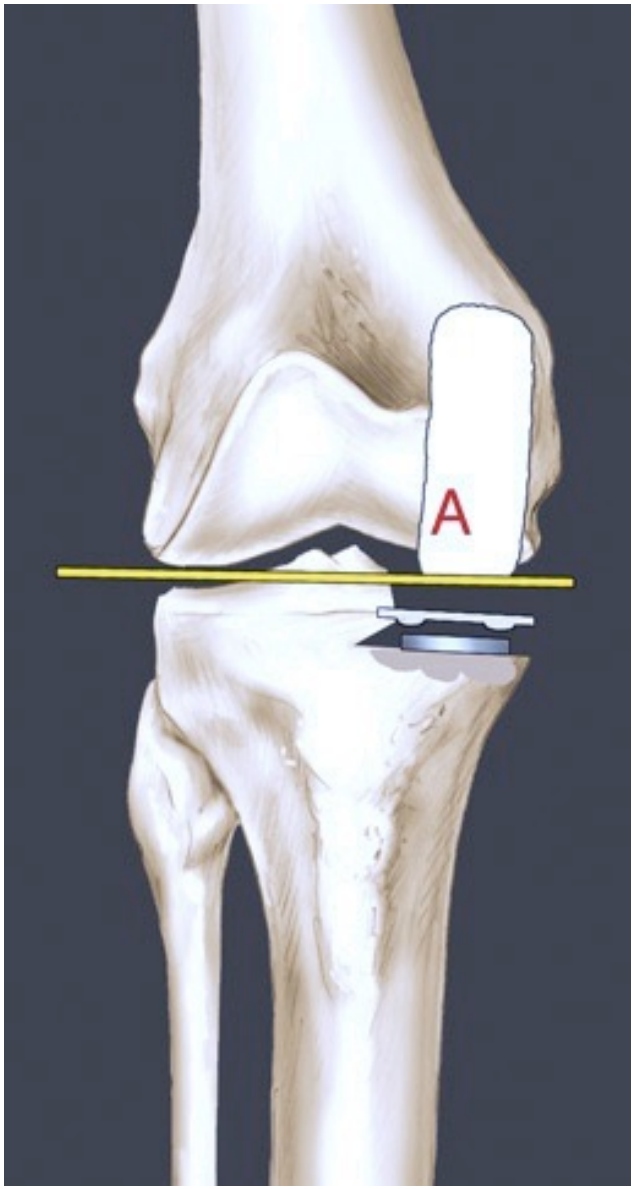
Over-tight ligaments

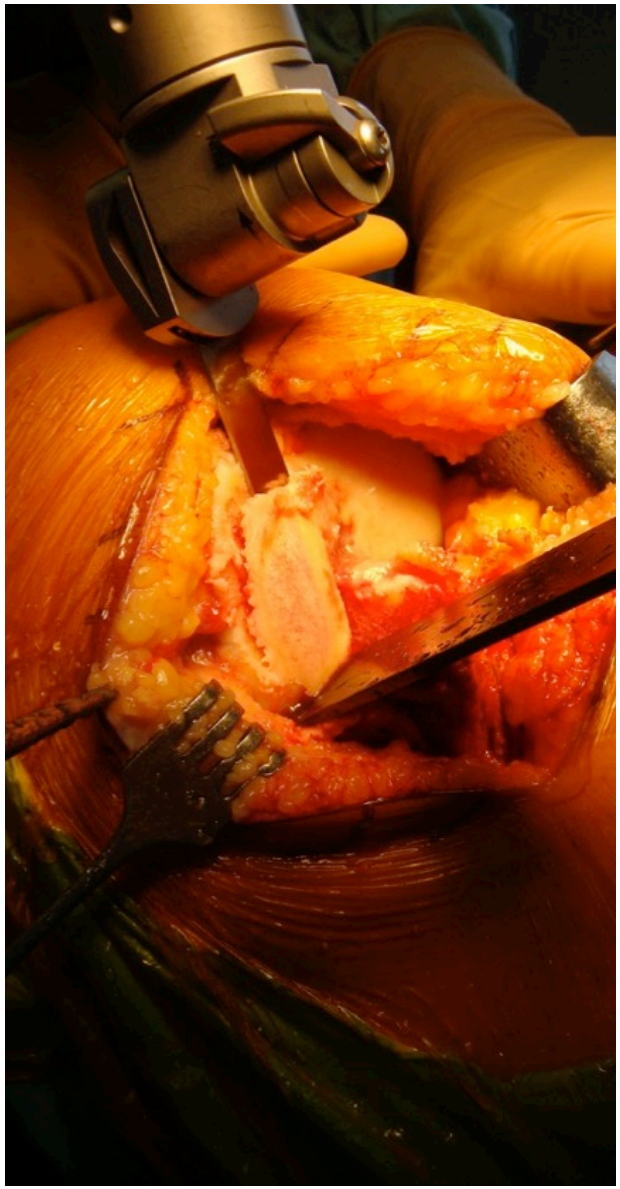



Excessive resection on tibia

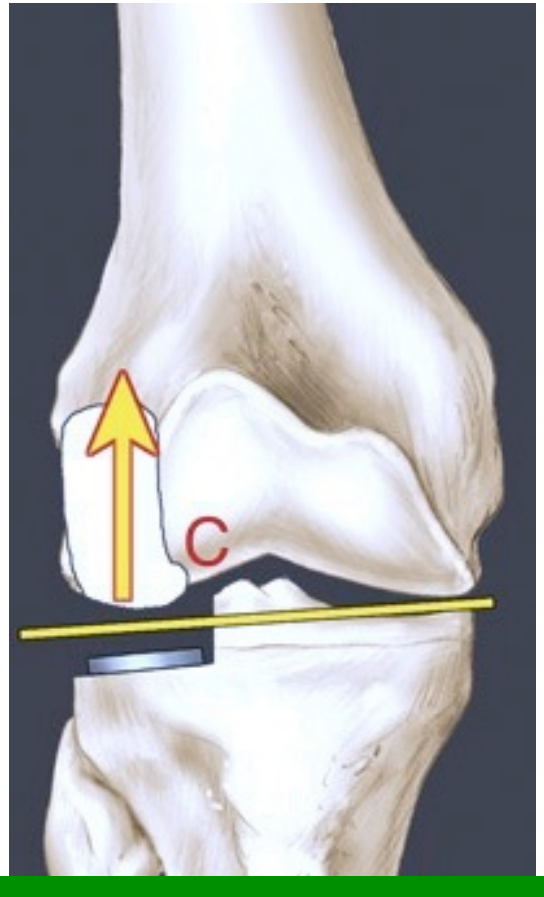


# Medial UKA: Resection is better



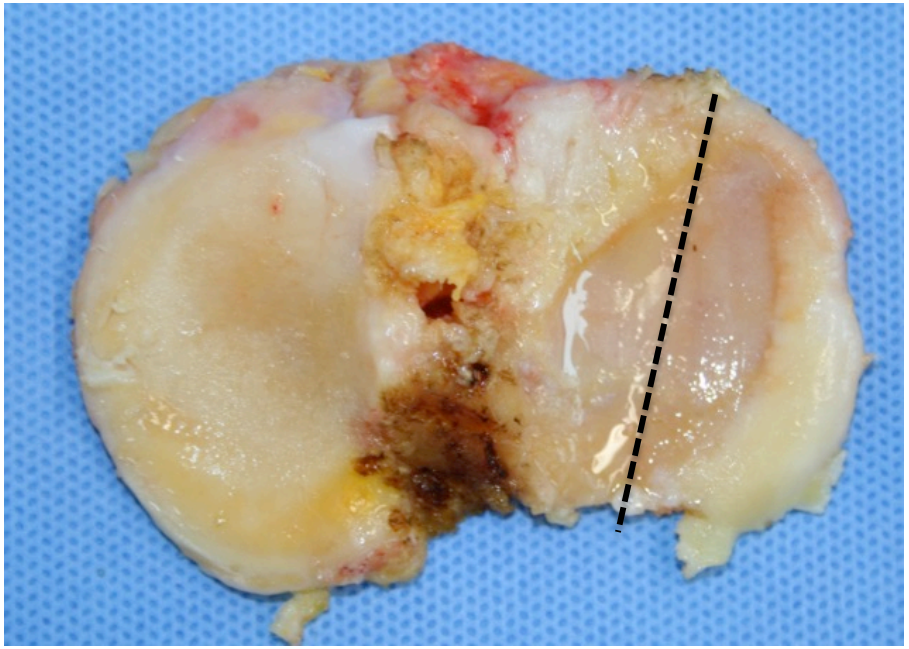



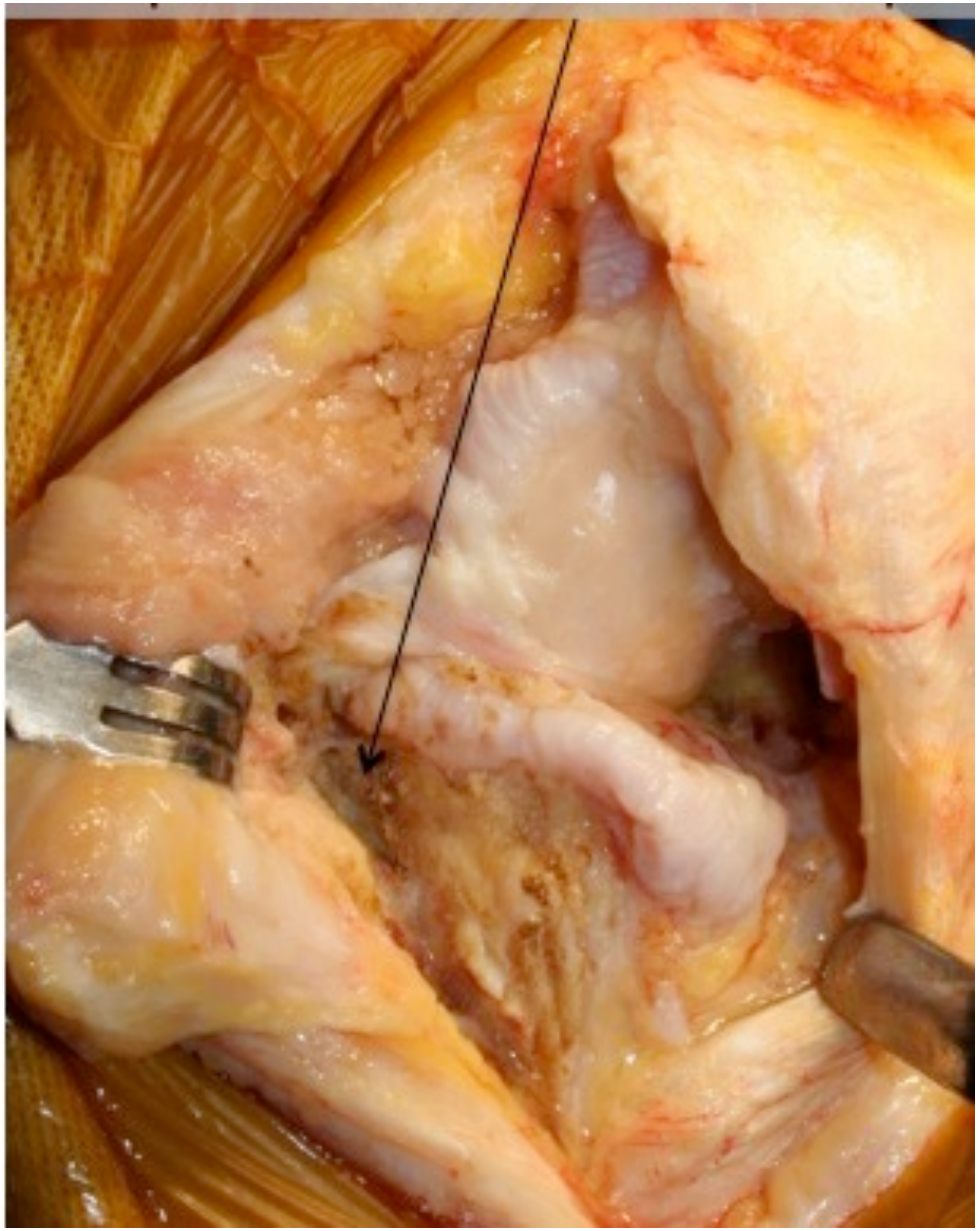
# **Resection**: disadvantages in lateral UKA




- Resurfacing UNI: Better for lateral OA
- Bone resection UNI: Better for medial OA

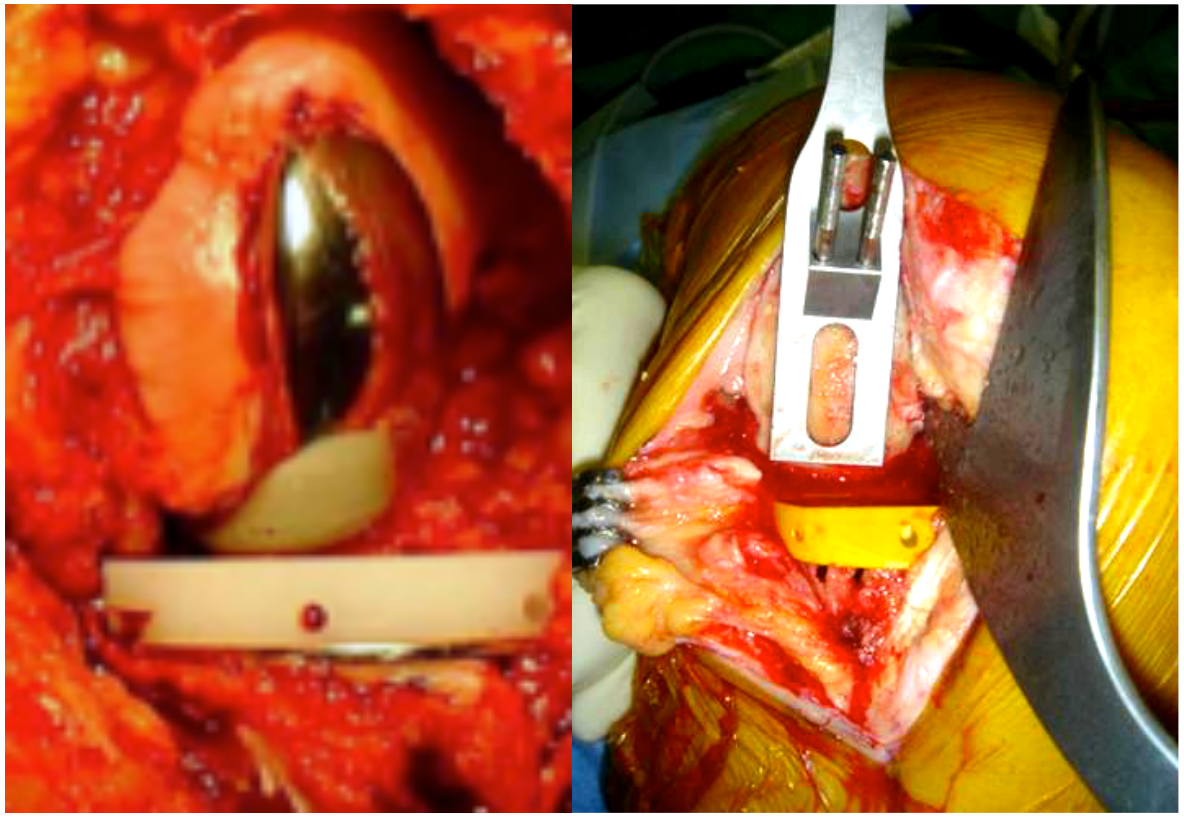
# 5 Higher risk of tibial malrotation





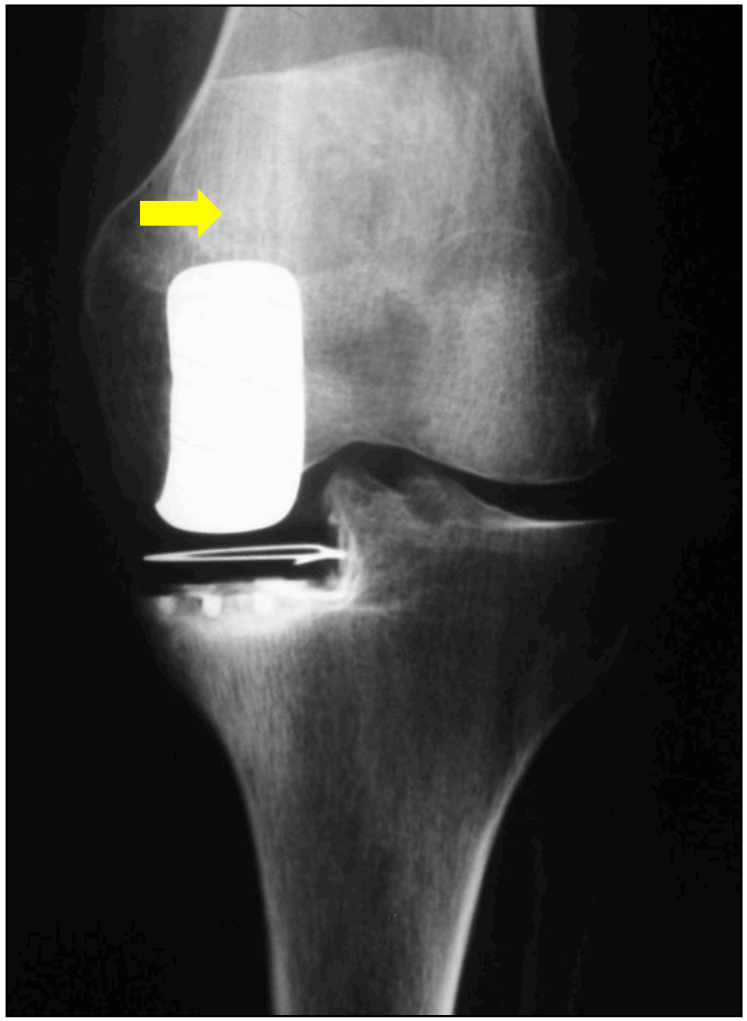
# 6 Mediolateral positionning

- Preserve the lateral osteophytes
- Femoral implant aligned with lateral osteophytes

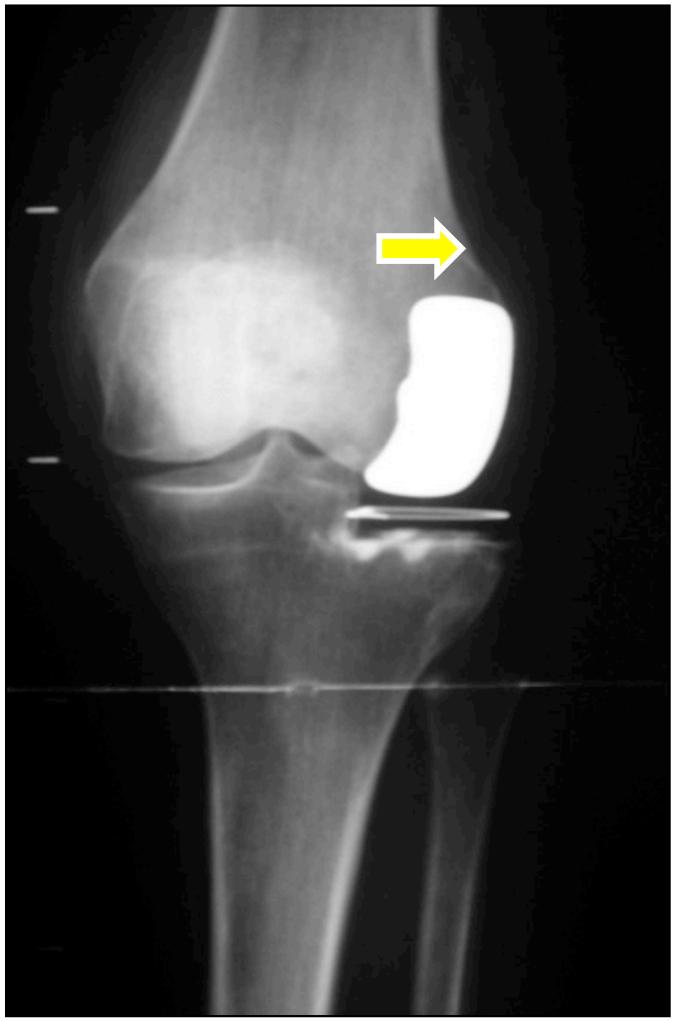


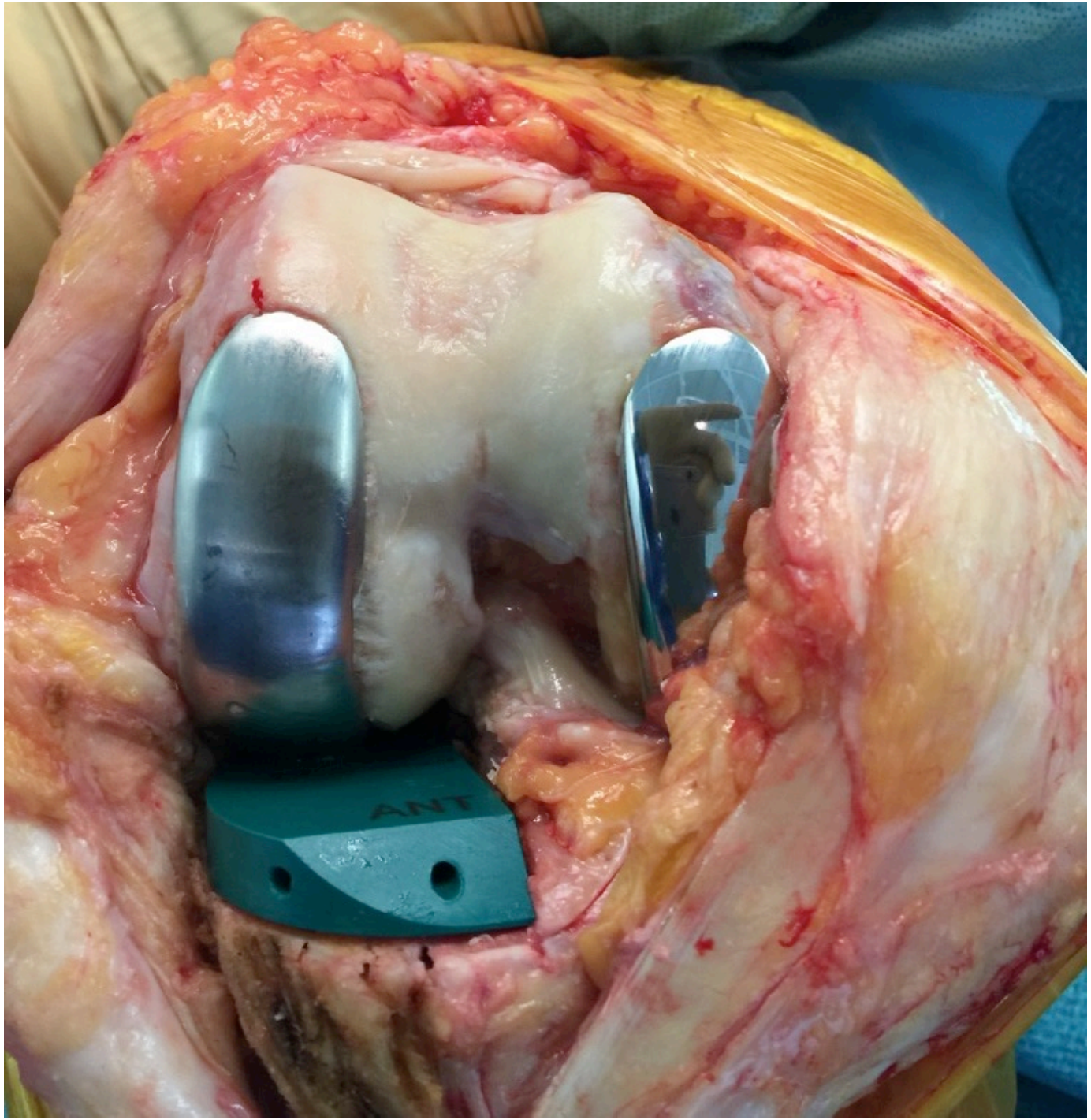
# Mediolateral positionning

## Medial Uni



## Lateral Uni

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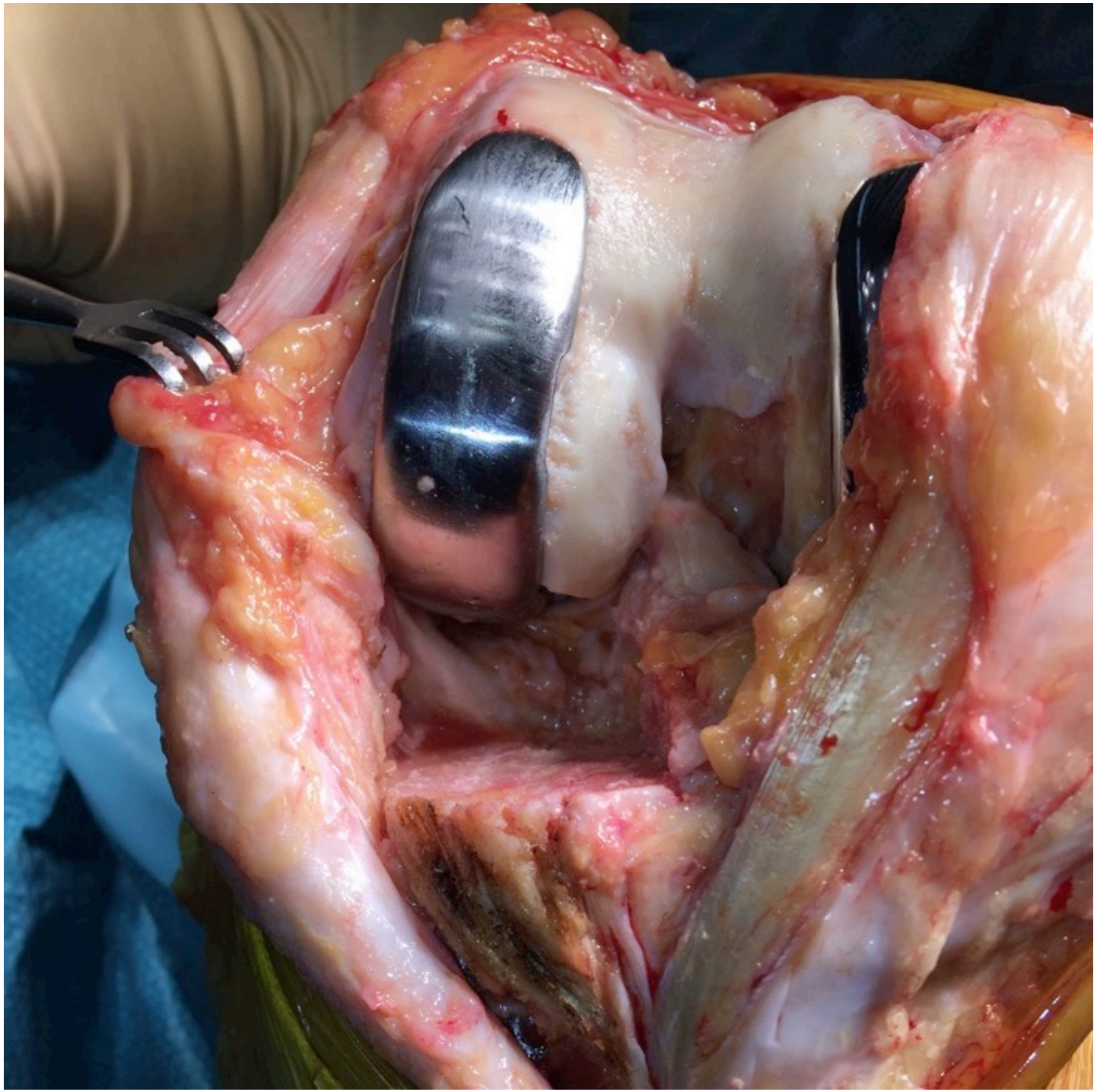
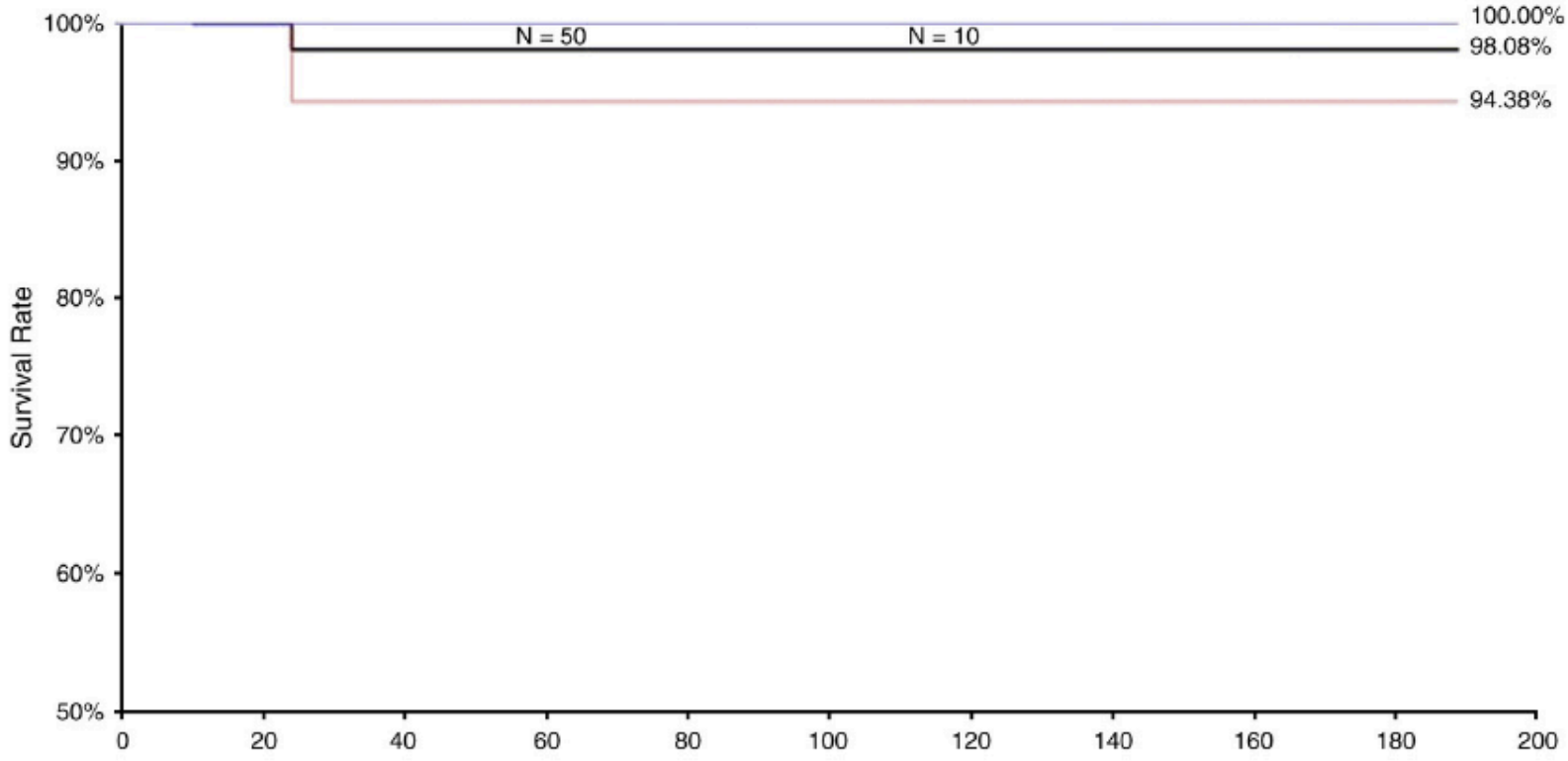


# Outcomes of lateral UKA

# End point Removal of UKA

**Lustig et al. J of Arthroplasty 2011**

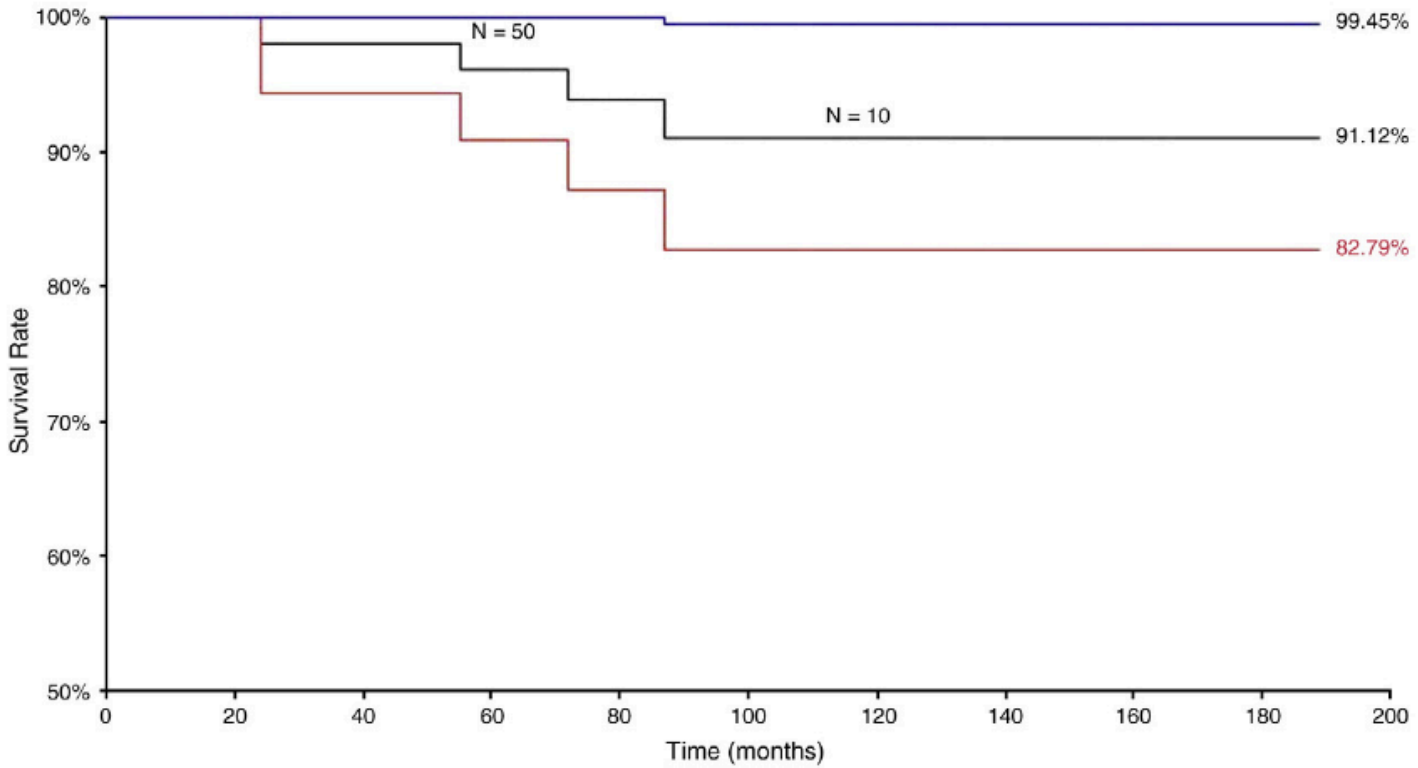
***99.08% at 10 ys*** *95% CI: 94 to 100*



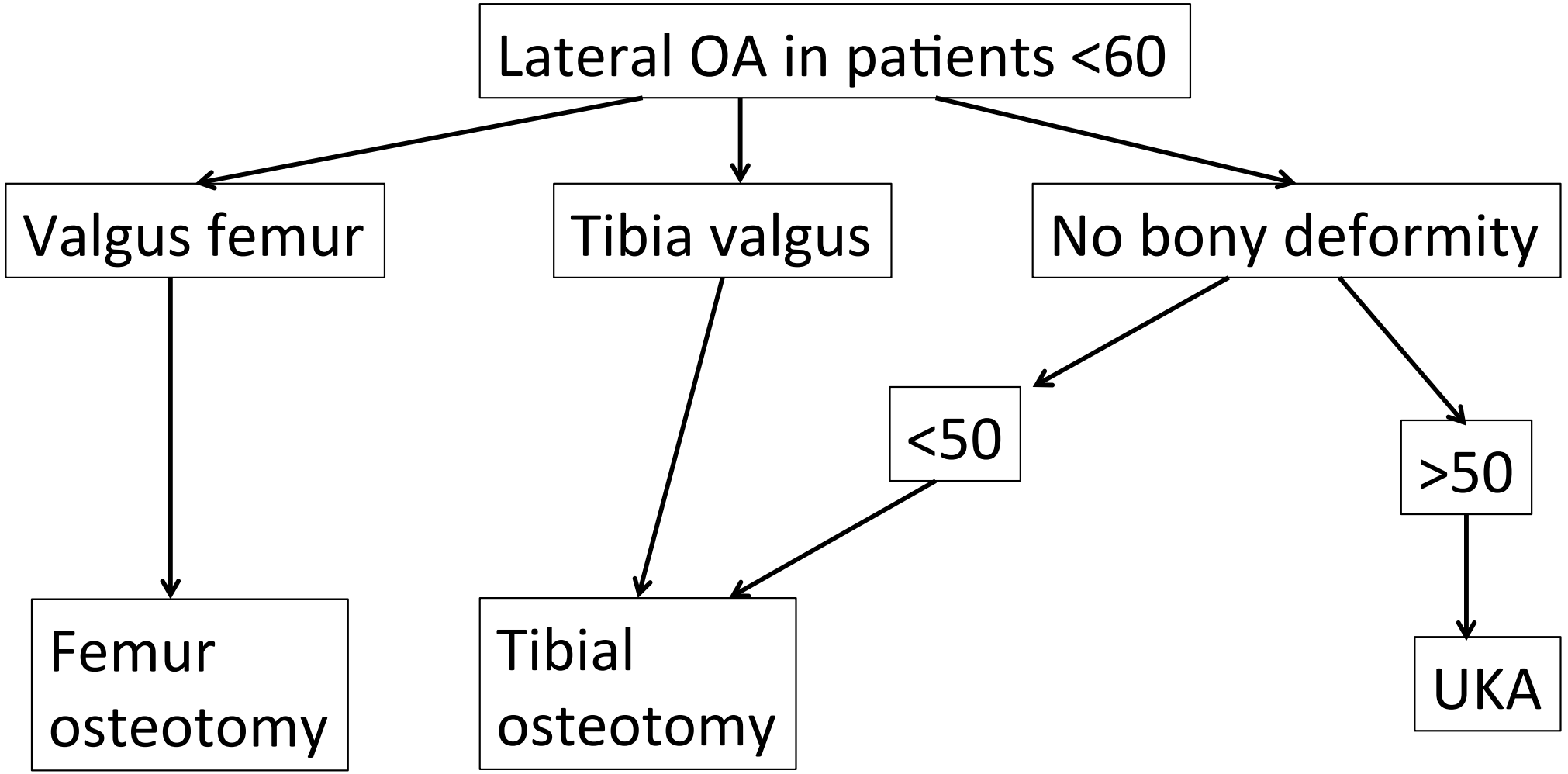
# End point: Revision or medial OA

**Lustig et al. J of Arthroplasty 2011**

***91.12%* at 10 ys** *95% CI: 82.7 to 99.4*



# Lateral OA in young patients

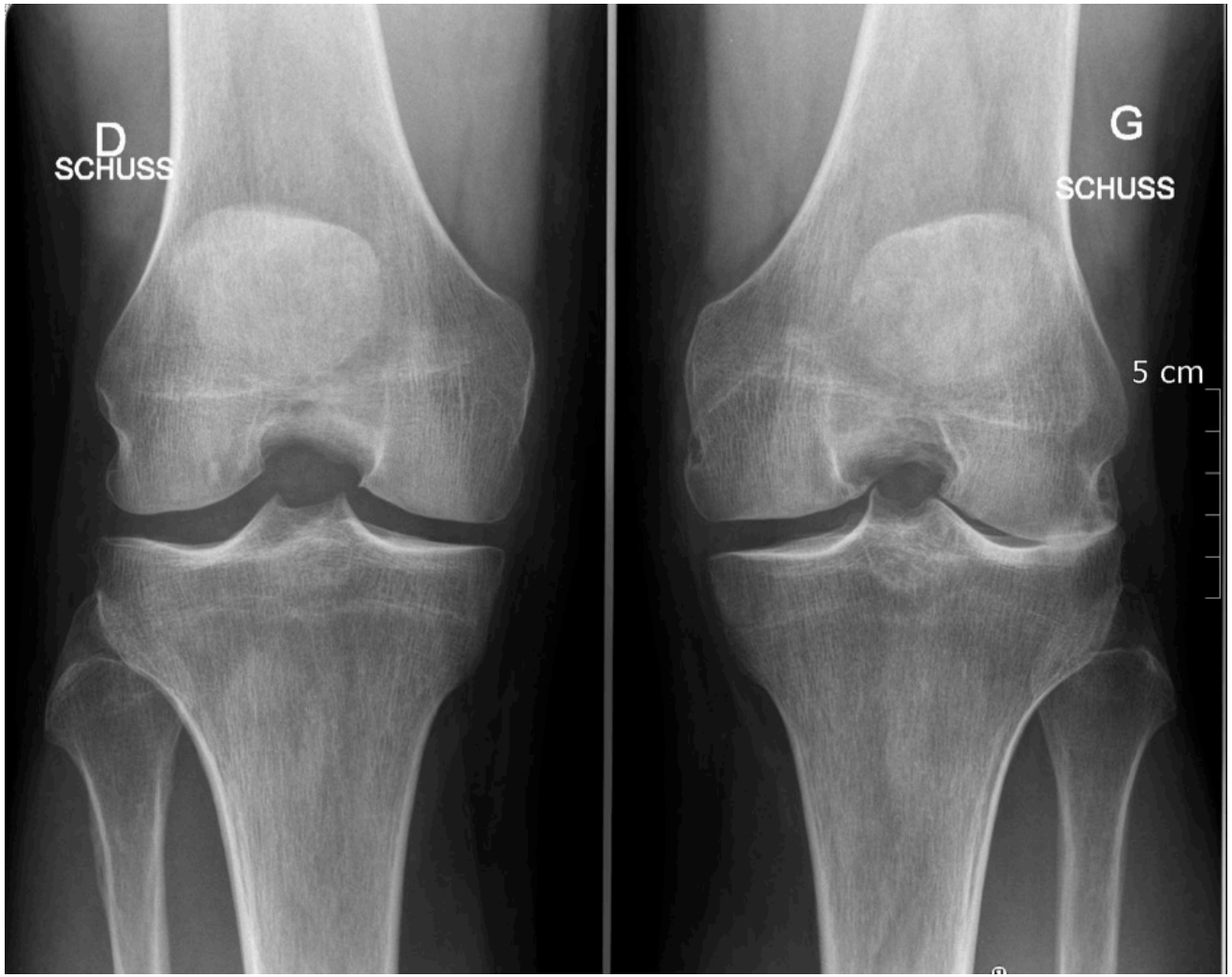


# exemples

# 43 years Constitutional Tibia valgus

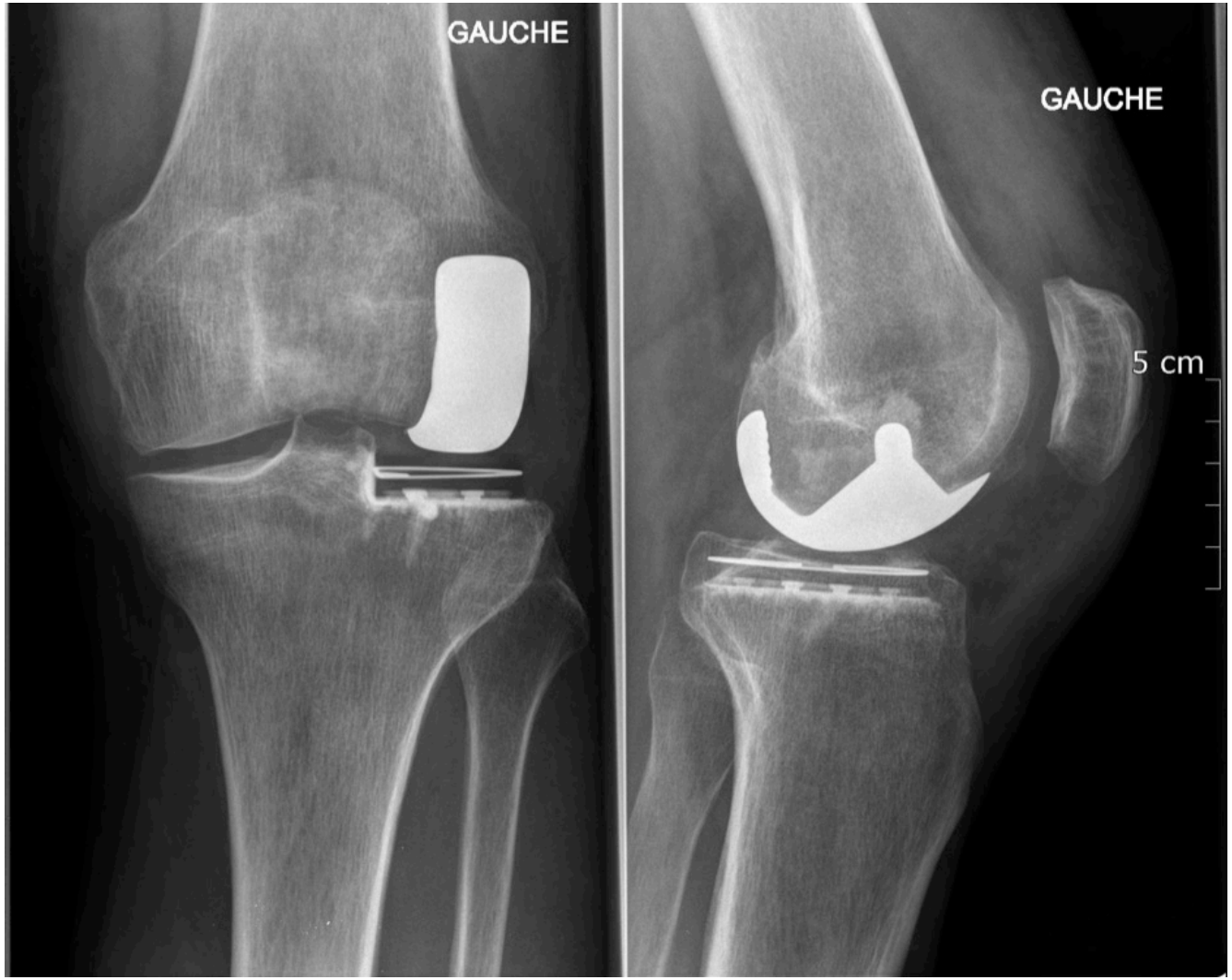

# Lateral OA well aligned

***55 y. Open lateral meniscectomy 30 years ago***




# Lateral OA well aligned

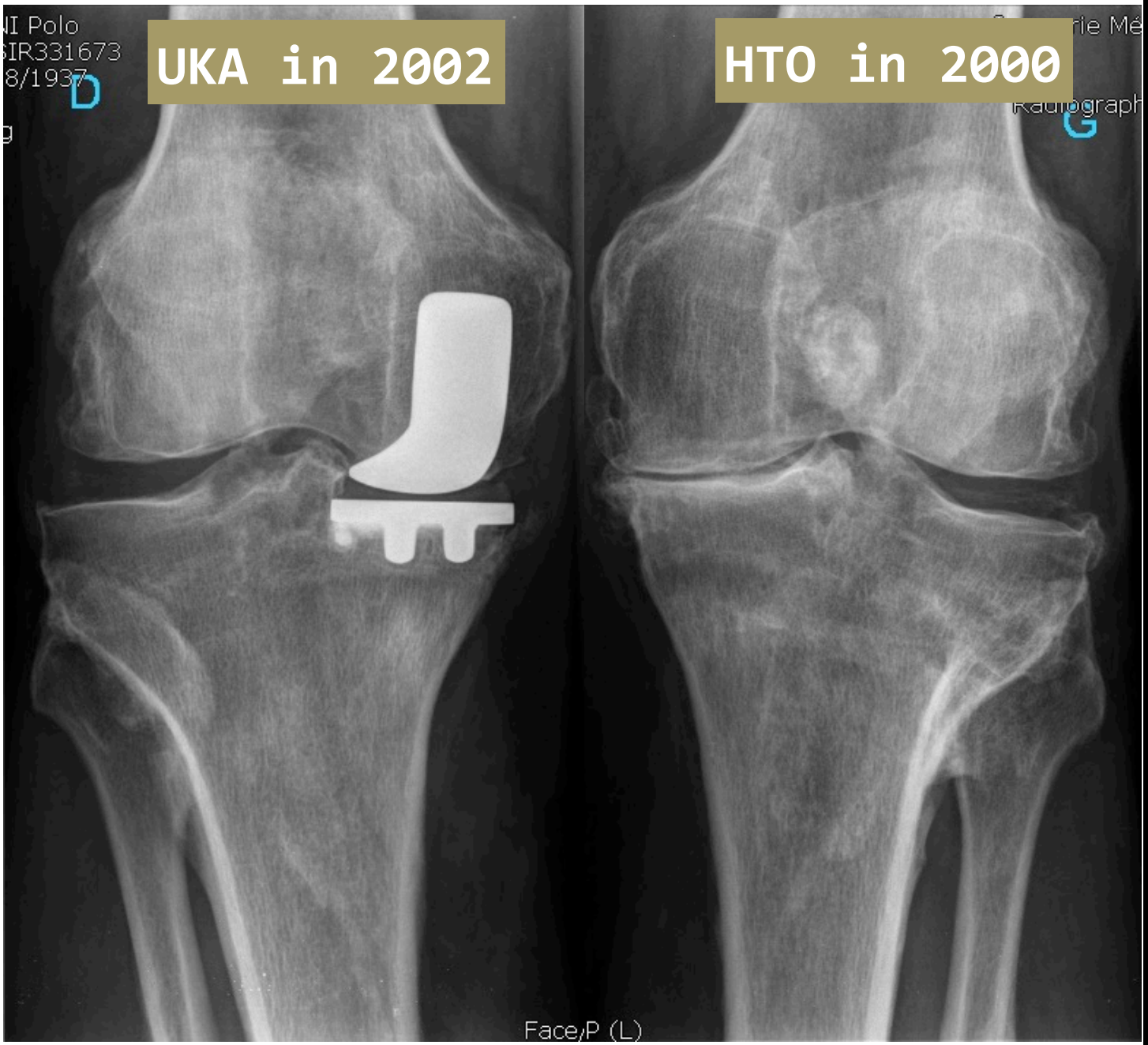
***55 y. Open lateral meniscectomy 30 years ago***




# Take home message:
# ‘analyze the anatomy’

- Constitutional bone deformity: Osteotomy or TKA
- No bony deformity: UKA or TKA

**UNI and HTO are rarely competitors!**


UKA in 2002
Face/P (L)


HTO in 2000


TKAs’ in 2014


Thank you
Toutes les photos de LYON ! http://www.Lyon-Photos.com