LYON SCHOOL of KNEE SURGERY

SANTY
MEDICAL INNOVATION IN MOTION

MEDIAL CLOSING HIGH TIBIAL OSTEOTOMY

Indications and technique

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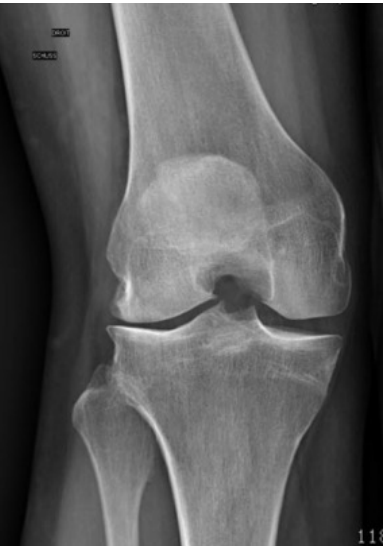
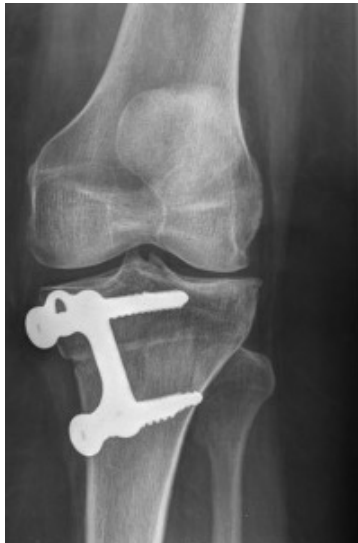




Introduction

- **Isolated lateral OA**: 7-10% of all knee OA *(Khan et al, JBJS am 2008)*

- Several etiologies *(Scott et al, BJJ 2013)*:
  - Femoral valgus
  - Proximal Tibial valgus
  - Lateral menisectomy
  - Post-traumatic OA

Lateral OA in young and active patients is difficult a challenge

↓

Osteotomy around the knee = alternative to TKA

Introduction

- Different options for varus osteotomies:

→ Distal femoral **(DFO)**

medial closing-wedge

lateral opening-wedge

→ Proximal tibial **(HTO)**

medial closing-wedge

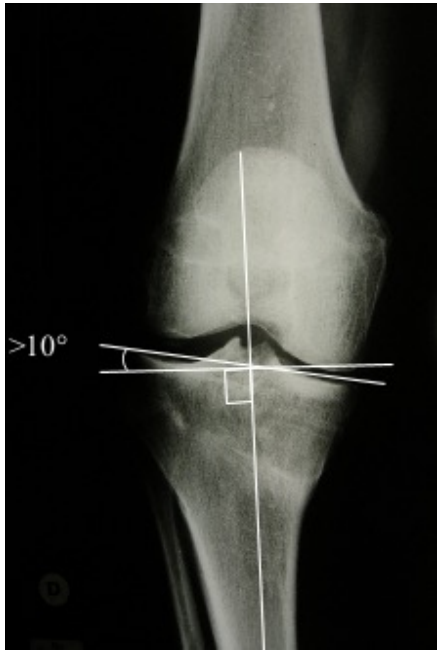
lateral opening-wedge

Introduction

Early reports of isolated HTO performed for large valgus deformity showed:

-risk of **overcorrection**

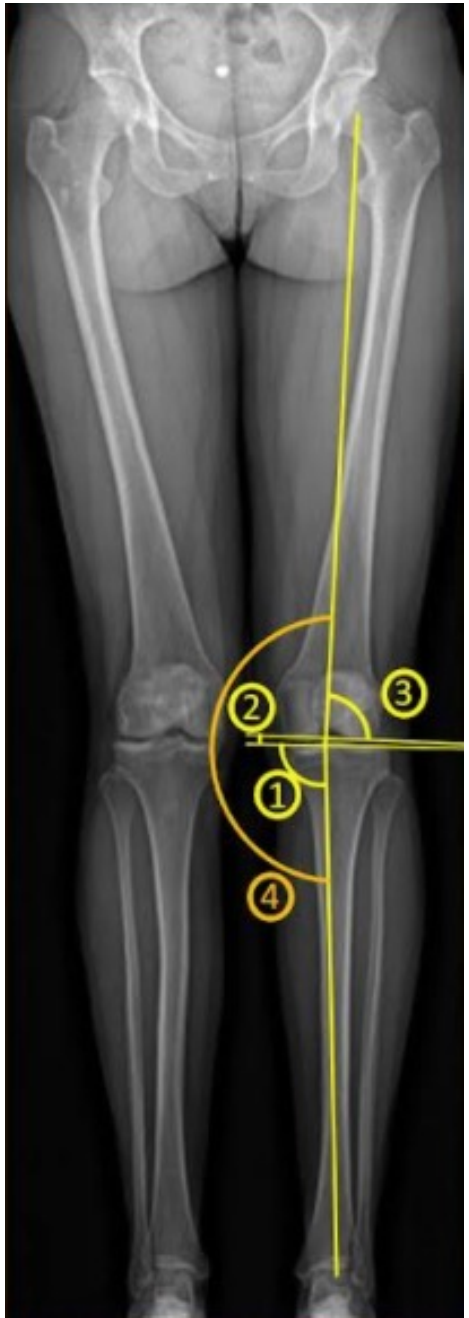
-creating **joint line obliquity**



Shoji et al, JBJS Am 1973
Coventry et al, JBJS Am 1987

→ Most studies focused on **distal femoral osteotomy** (DFO)

Deformity analysis



1. **MPTA**: mechanical Medial Proximal Tibial Angle (85-90°)

2. **JLCA**: Joint Line Convergence Angle (0-3°)

3. **mLDFA**: mechanical Lateral Distal Femoral Angle (85-90°)

4. **mFTA**: mechanical Femoro-Tibial Angle (180 +/- 3°)

Genu valgum: Tibia valga involved in 50%

Alghamdi et al, J Arthro 2014
Eberbach et al, AJSM 2017

Indications / Contraindications of HTO

INDICATIONS

- Symptomatic lateral femorotibial OA (**Ahlbäck scores 2-3**)

AND

- **No OA in medial compartment**

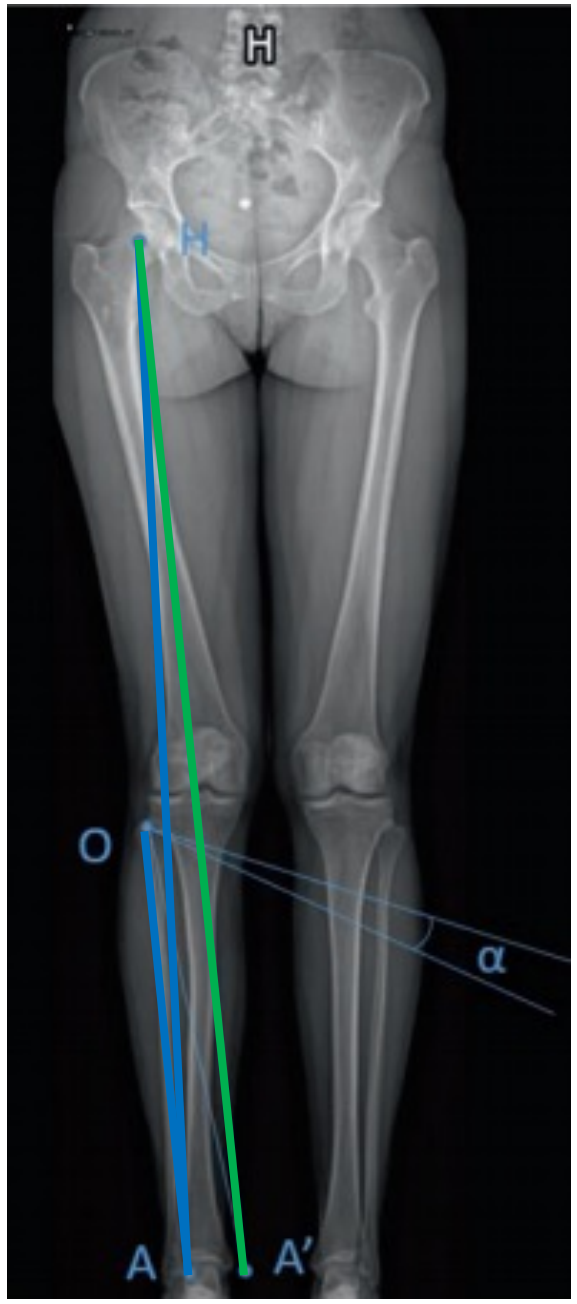
AND

- **No tibia vara**

CONTRAINDICATIONS

- BMI **> 30 kg/m²**
- **Chronic inflammatory rheumatism**
- Lateral femorotibial OA **Ahlbäck grade 4**
- Knee **stiffness** (>10° of flexion contracture and/or <90° of knee flexion)

Surgical planning



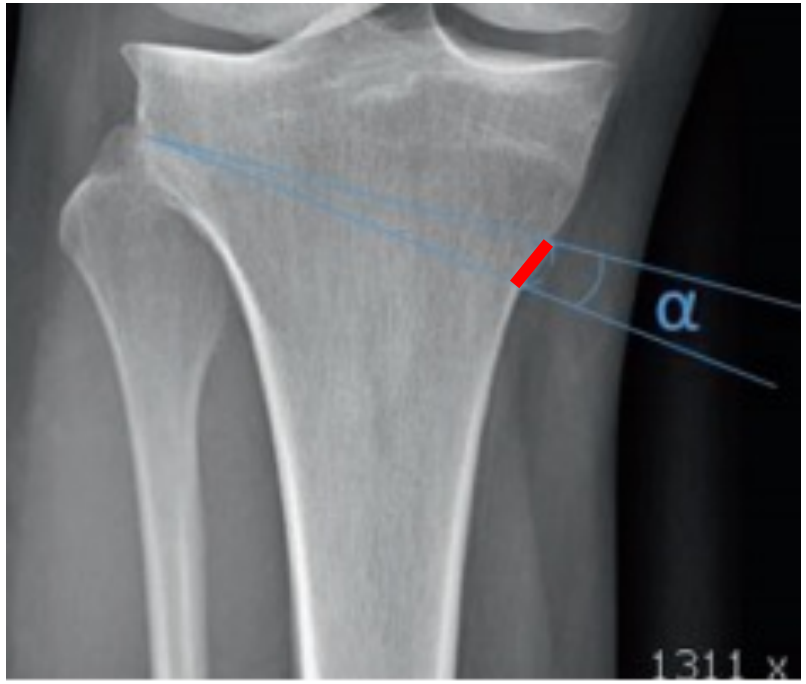
Miniaci technique

Correction target: mFTA through the **medial tibial spine (Normo-correction)**
(Chambat et al, OTSM 2000)

O: Lateral Hinge of the osteotomy

α : Desired correction angle

Evaluation of the wedge resection



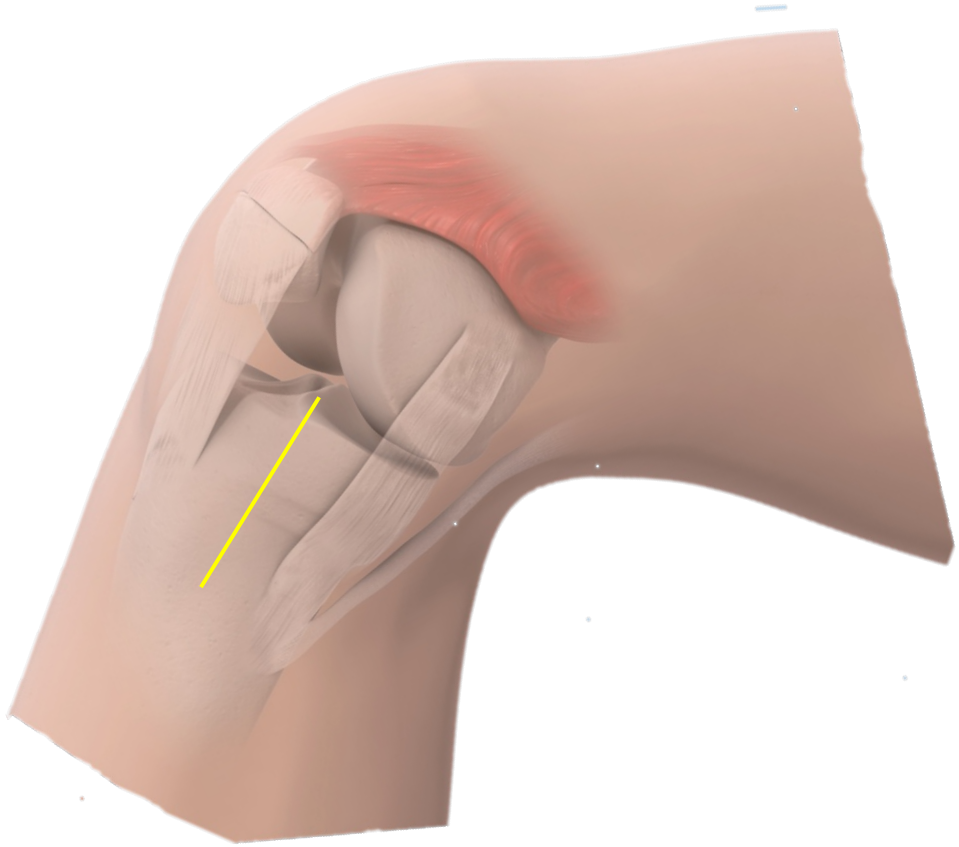
Surgical technique

- Supine position, Knee flexed 90°
- Fluoroscopic guidance

- **Arthroscopy first** for intra-articular assessment +/- meniscal or cartilage debridement

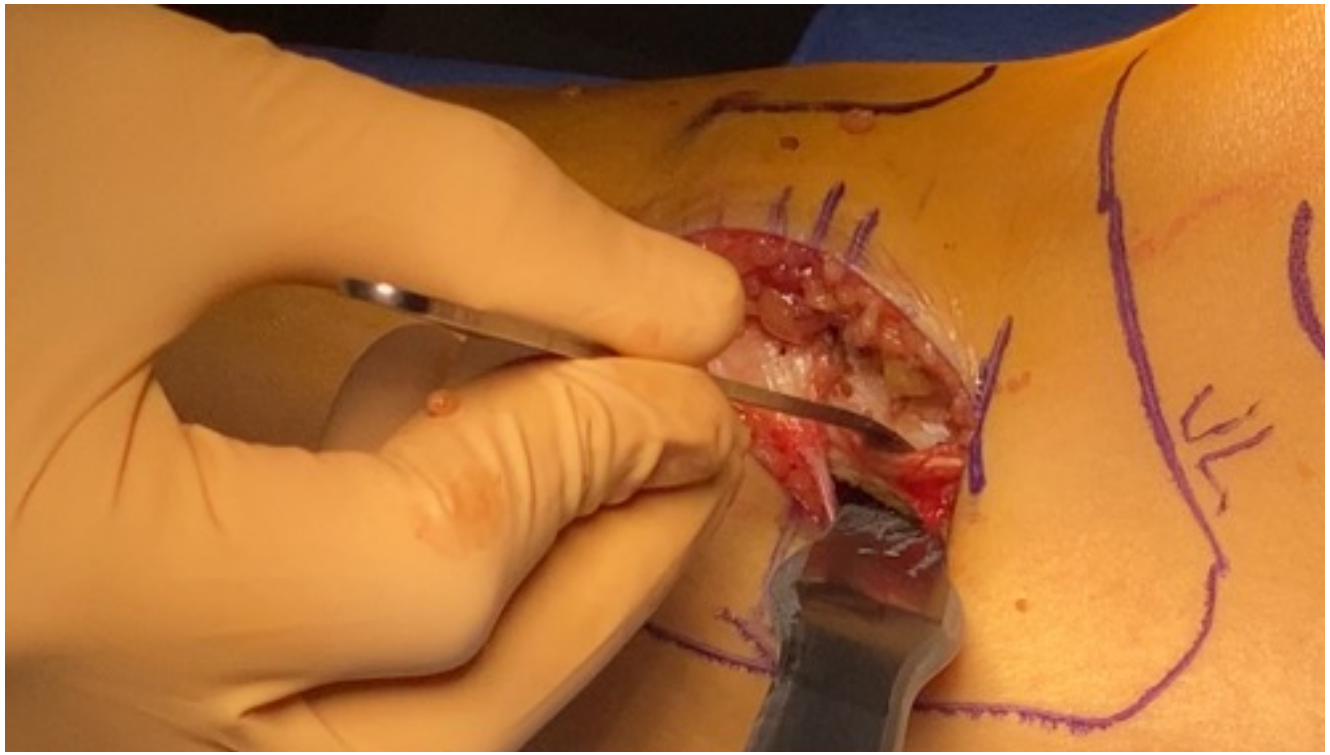
Surgical technique

- **Anteromedial approach**



Courtesy M. Ollivier

Surgical technique



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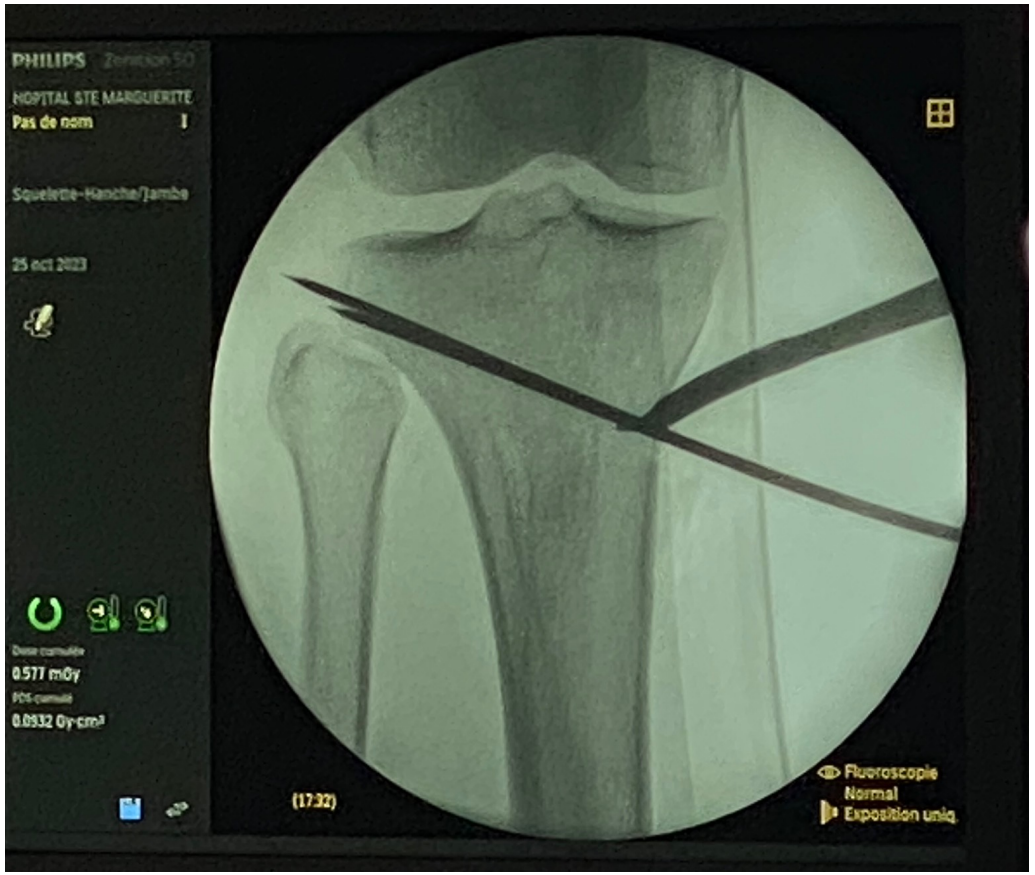
- Release of Pes anserinus tendons
- Release / Section of Superficial layer of MCL
- Posterior retractor

Surgical technique



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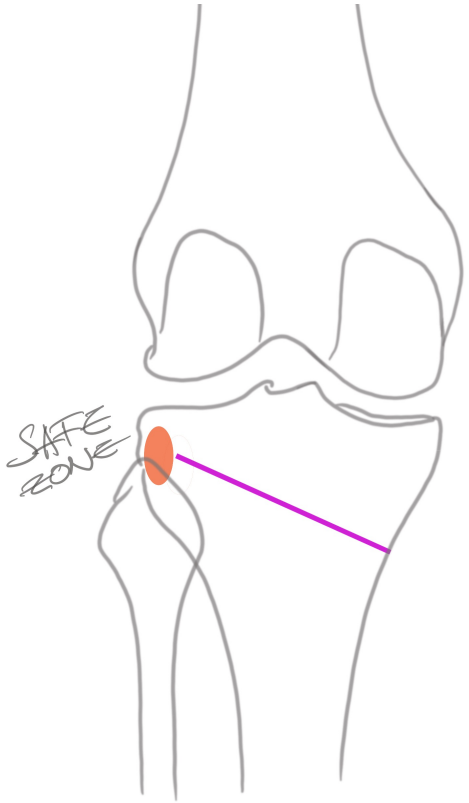
- **2 parallel Kirschner wires** from medial to upper part of prox. tibiofiular joint

Surgical technique

- **Osteotomy** with oscillating saw
(keep lateral hinge)



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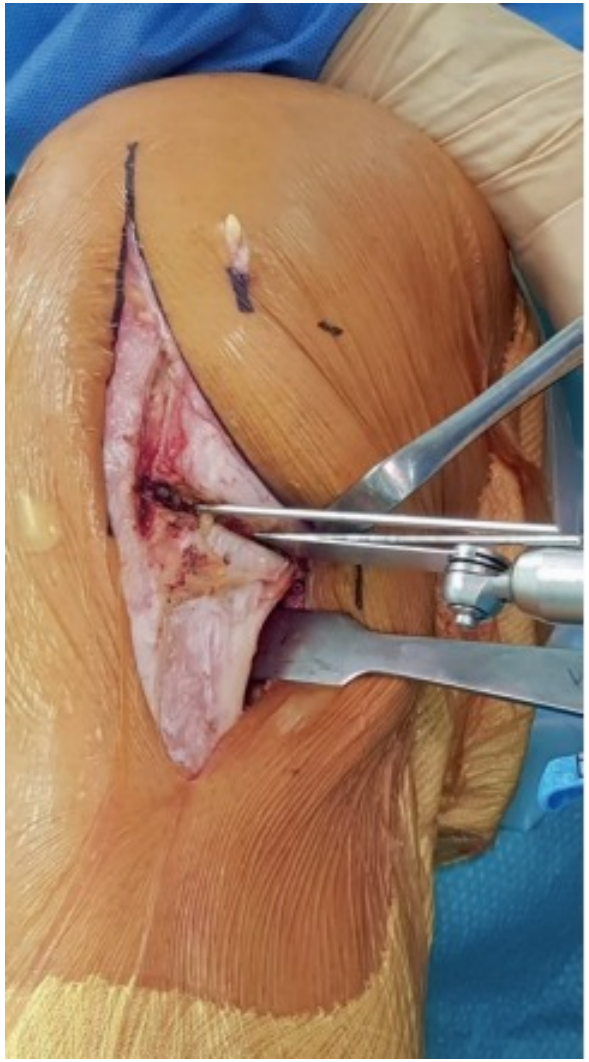
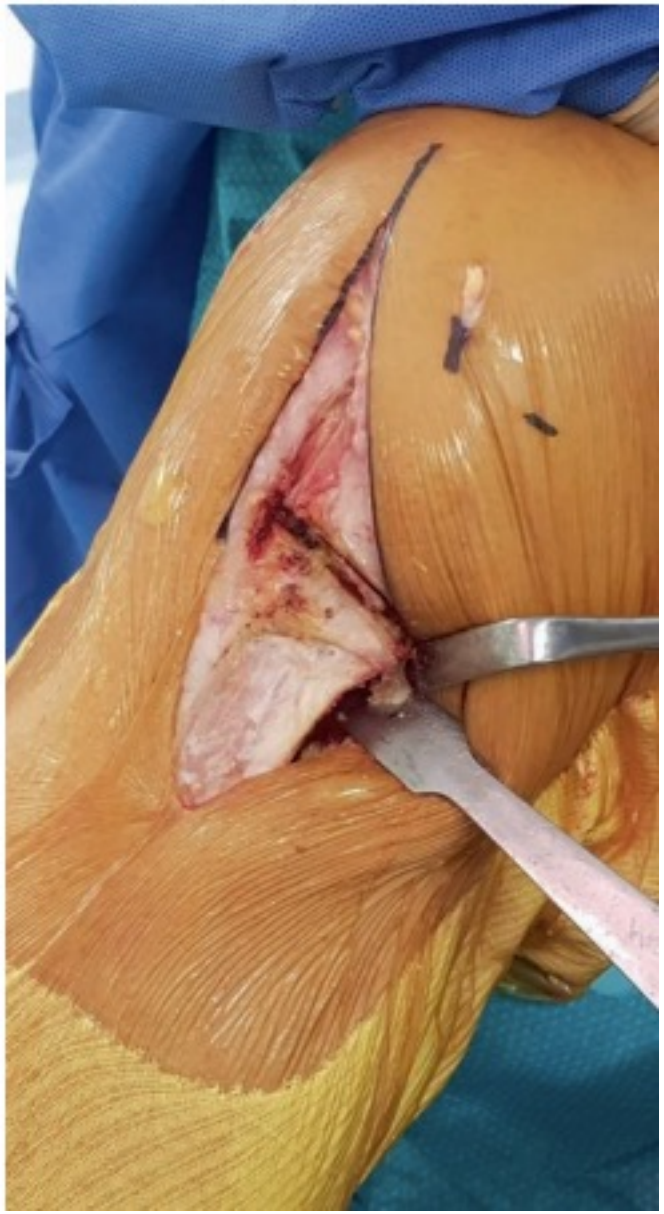
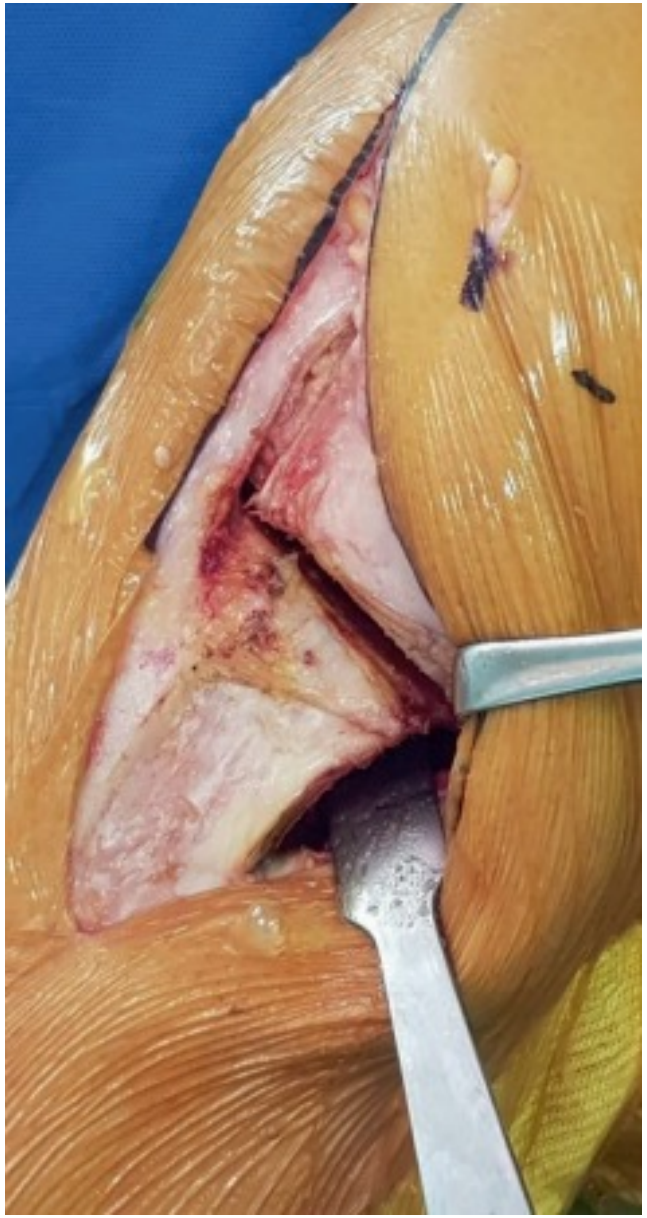


Surgical technique





- **Second cut:** inferior to the first
(preoperative planning)

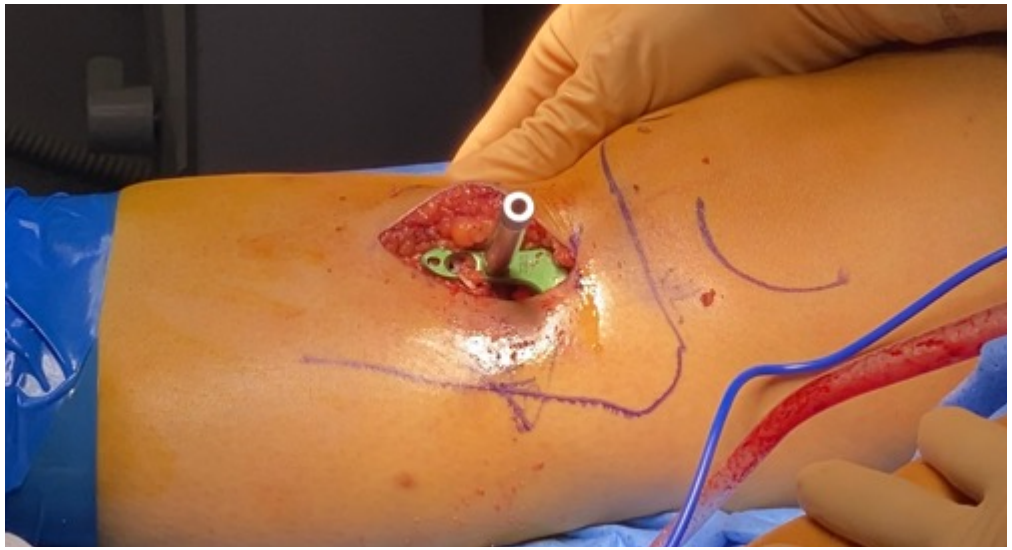
- Resection of triangular bone

- Consider thickness of the saw blade

- **AVOID OVERCORRECTION**

Surgical technique

- Final fixation with **L-Plate**



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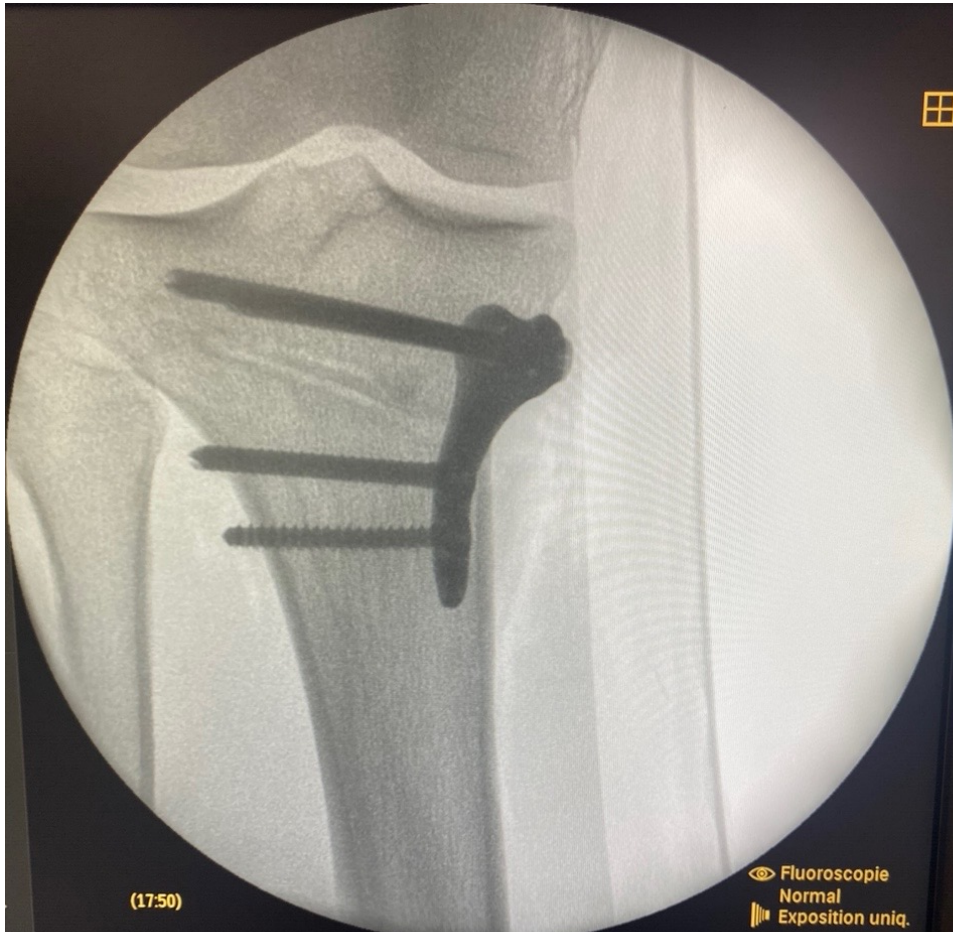
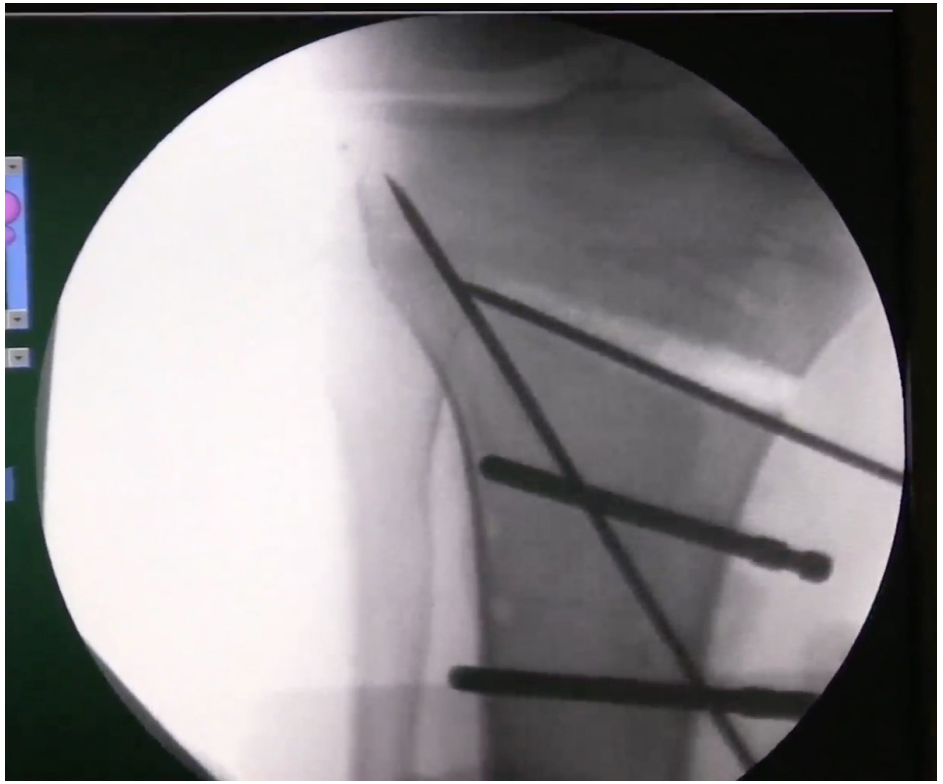


Tips & Tricks



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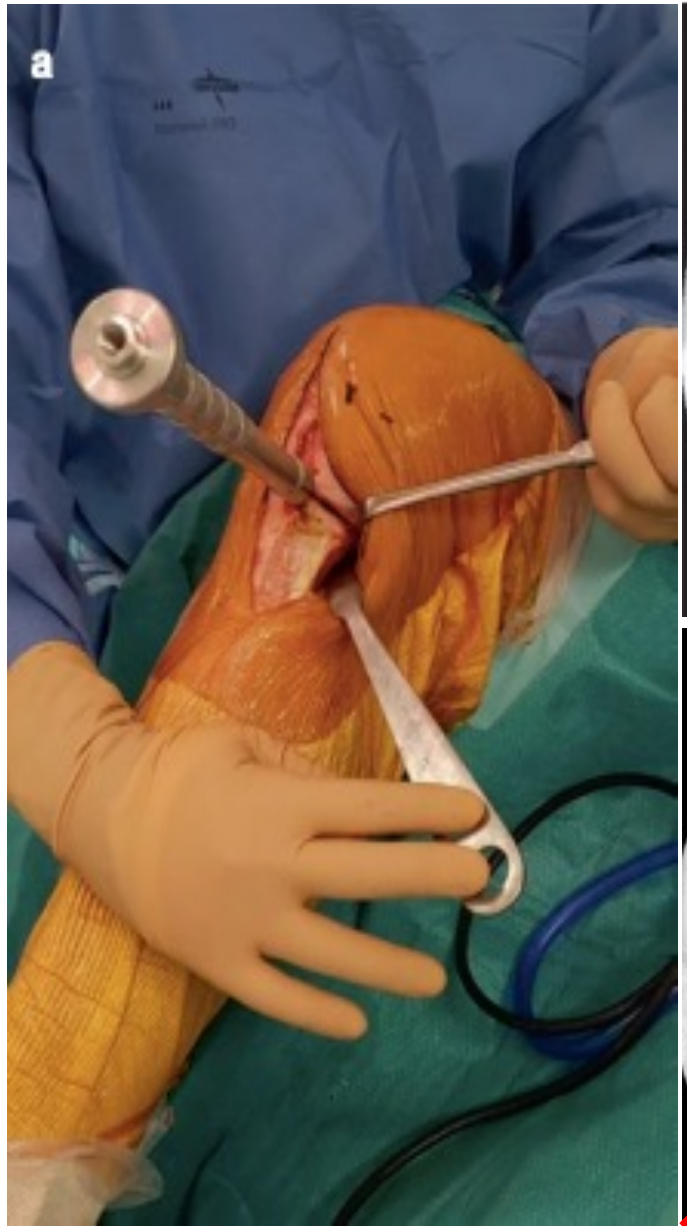
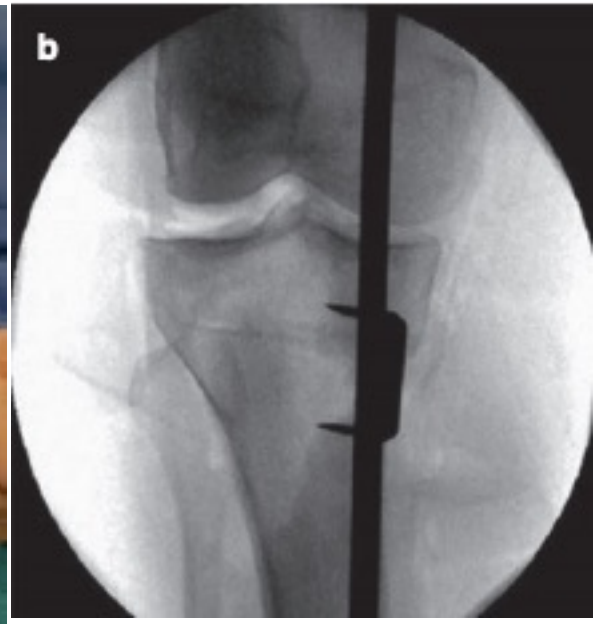
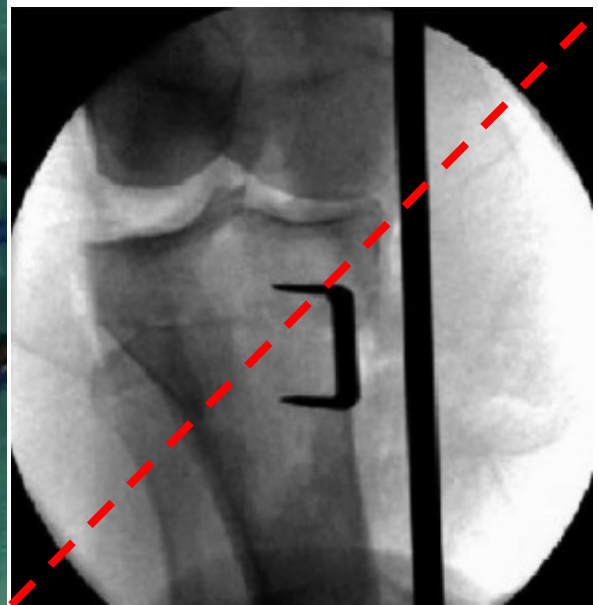
- Place a HINGE PIN
- **8 times more stable**

Tips & Tricks







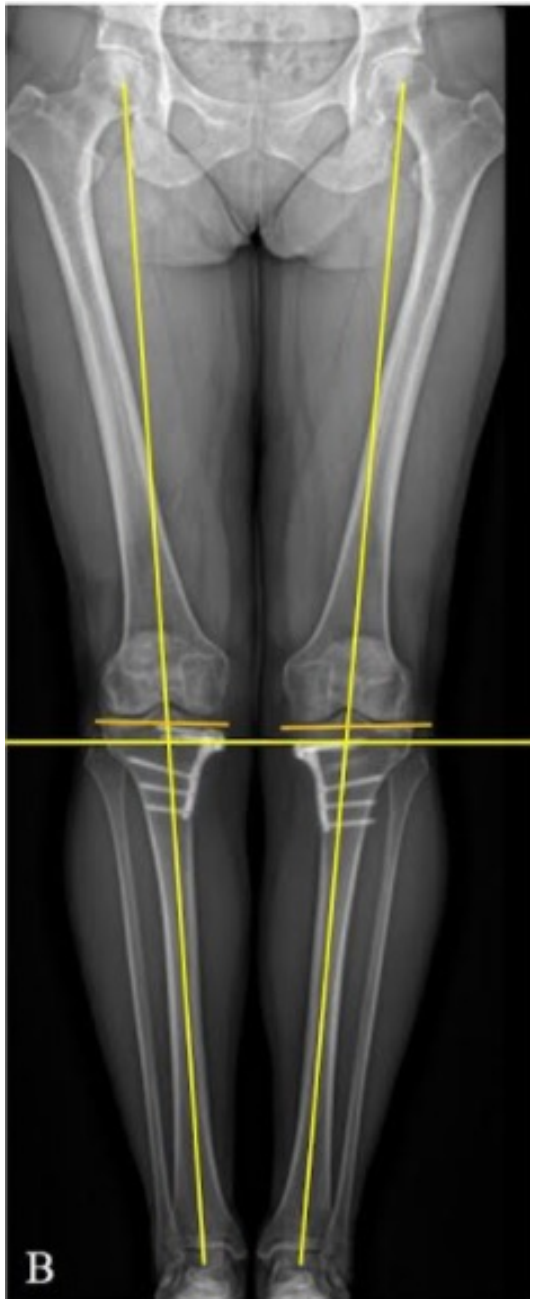
- HTO temporary fixed with **surgical staple**
- Fluoroscopy assessement with **no varus stress**

Closing wedge HTO: best indication

Varus HTO: predictive factors of good results:

Pre-op Tibia valga – No tibia vara
Postoperative MPTA ≥ 85°
No overcorrection

Coventry. JBJS Am 1973
Shoji and Insall. JBJS Am 1987
Mirouse et al OTSR 2017
Lambrey et al. Submitted 2024



Conclusion

VARUS CLOSING WEDGE HTO:

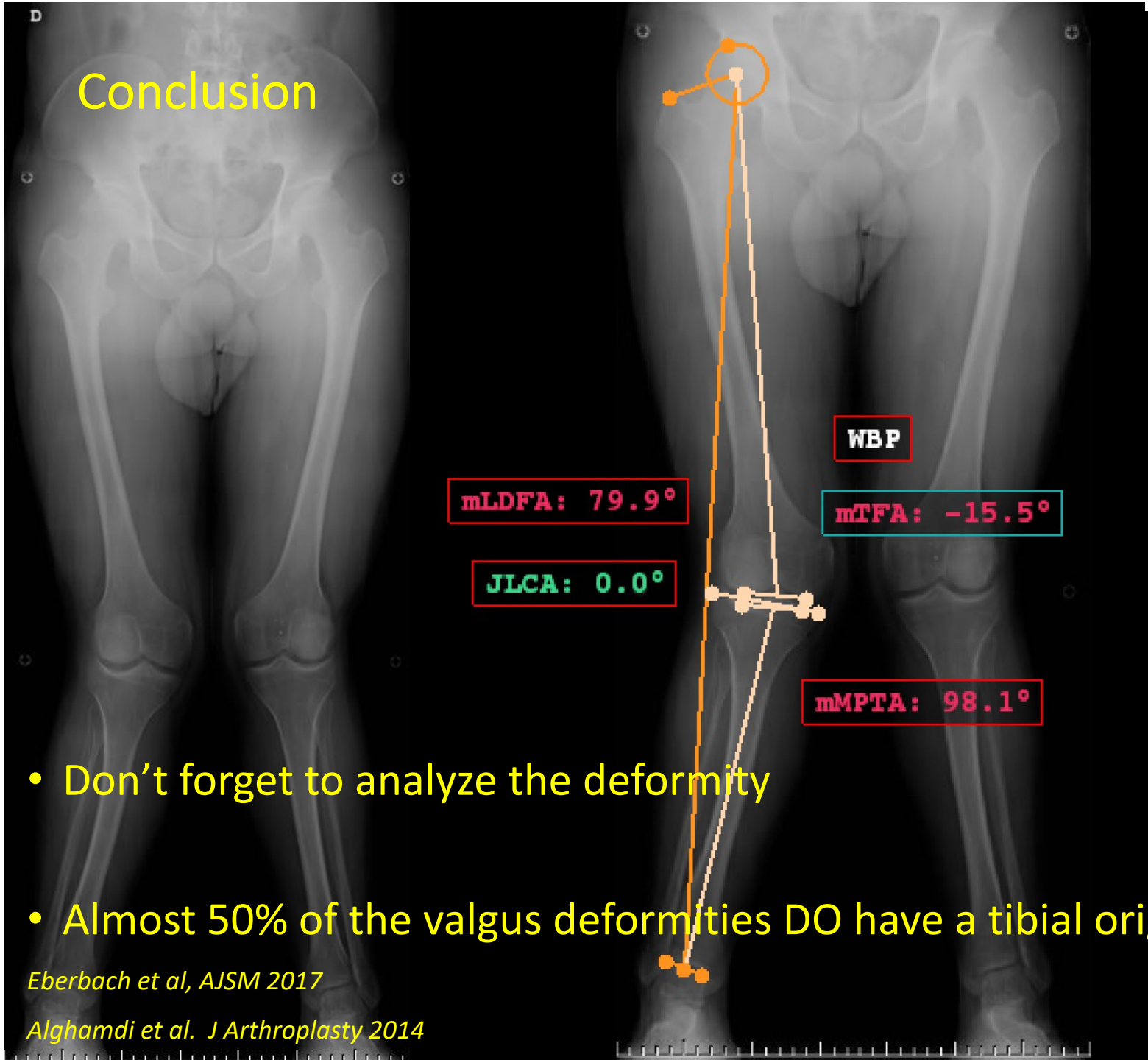
- Safe procedure – Low complication rate
- Bone union +++
- Good long term results:

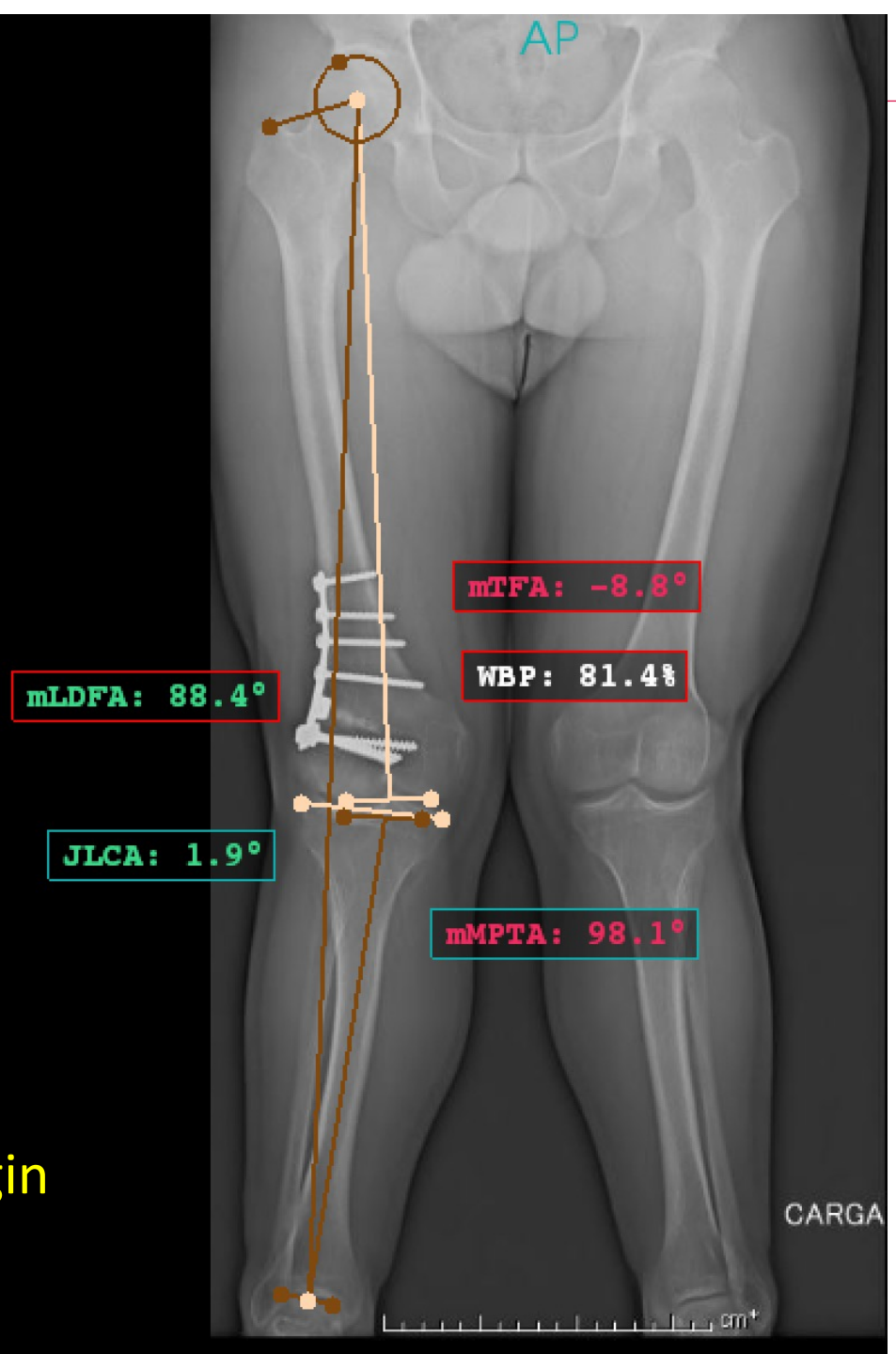
Survivorship 93.5% (95%CI [83.6 - 97.5]) at 5 years and 71.7% (95%CI [55.6 - 82.7]) at 10 years.
Median time to TKA was 12.7 years 95%CI [10.6 - 17.1]

Post-operative MPTA

The risk of conversion to a TKA is 20 times higher for patients with a postoperative mPTA outside the optimal range of 85°-90°

Conclusion

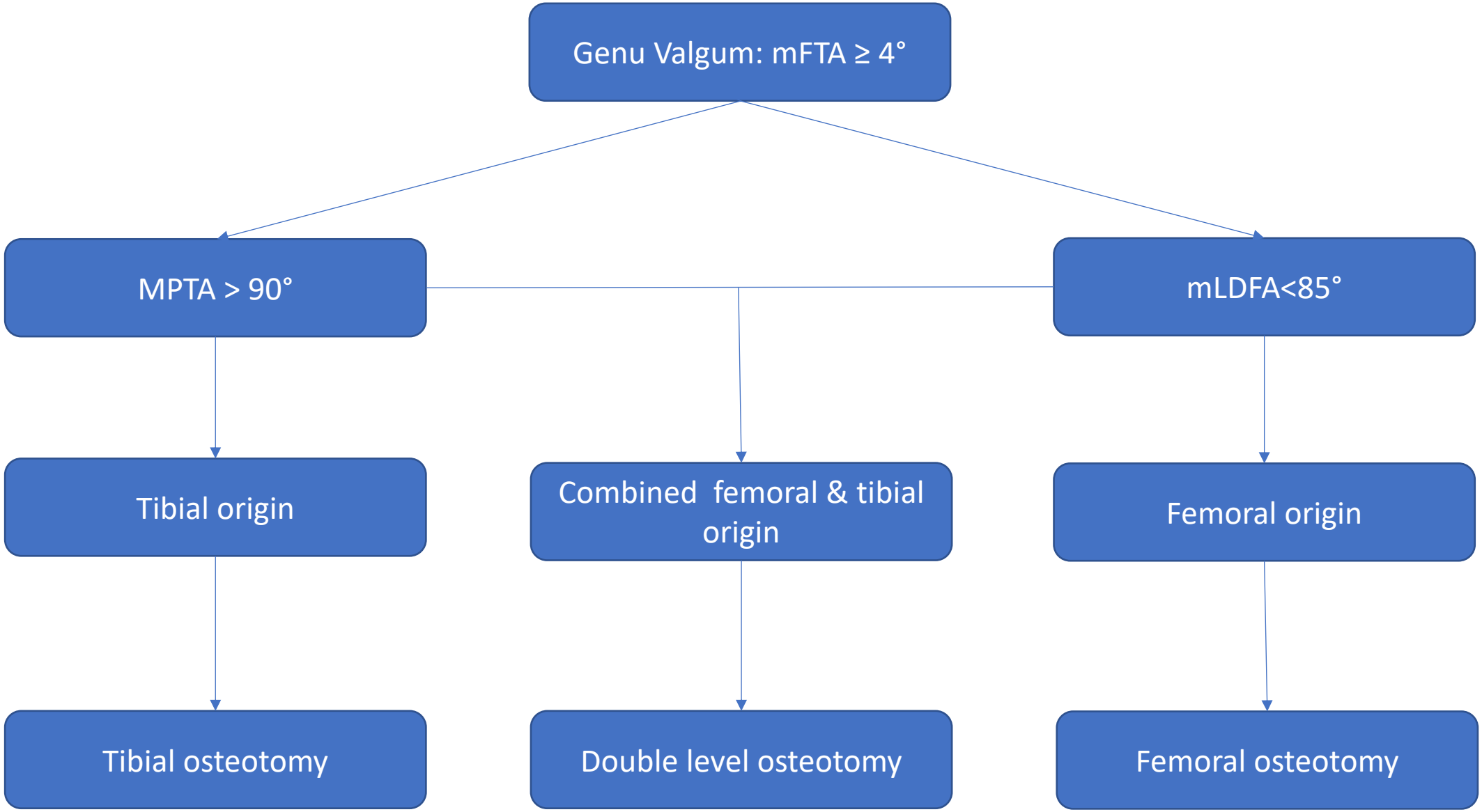




- Don’t forget to analyze the deformity
- Almost 50% of the valgus deformities DO have a tibial origin

Eberbach et al, AJSM 2017

Alghamdi et al. J Arthroplasty 2014


Genu Valgum: mFTA ≥ 4°
MPTA > 90°
mLDFA<85°
Tibial origin
Combined femoral & tibial origin
Femoral origin
Tibial osteotomy
Double level osteotomy
Femoral osteotomy

Thank You

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