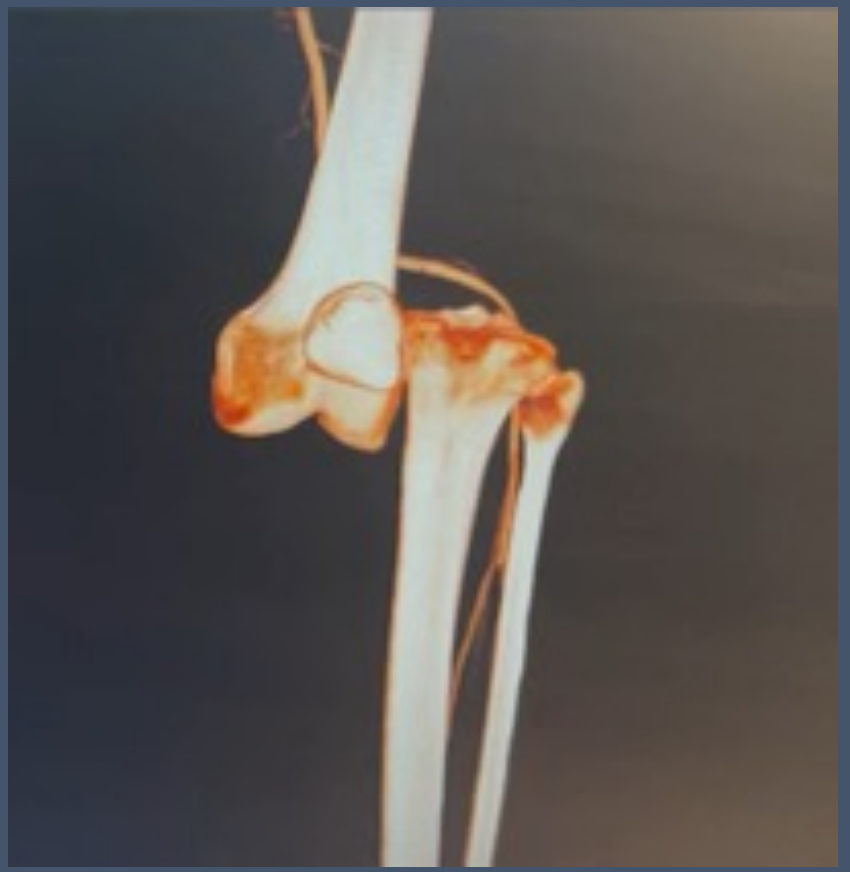
**Pr Thomas NERI**
**MD, PhD**

Inter-university Laboratory of Human Movement Science, EA 7424, Univ Lyon

Sport and Arthritis University center

University hospital of Saint-Etienne, Saint Etienne, France

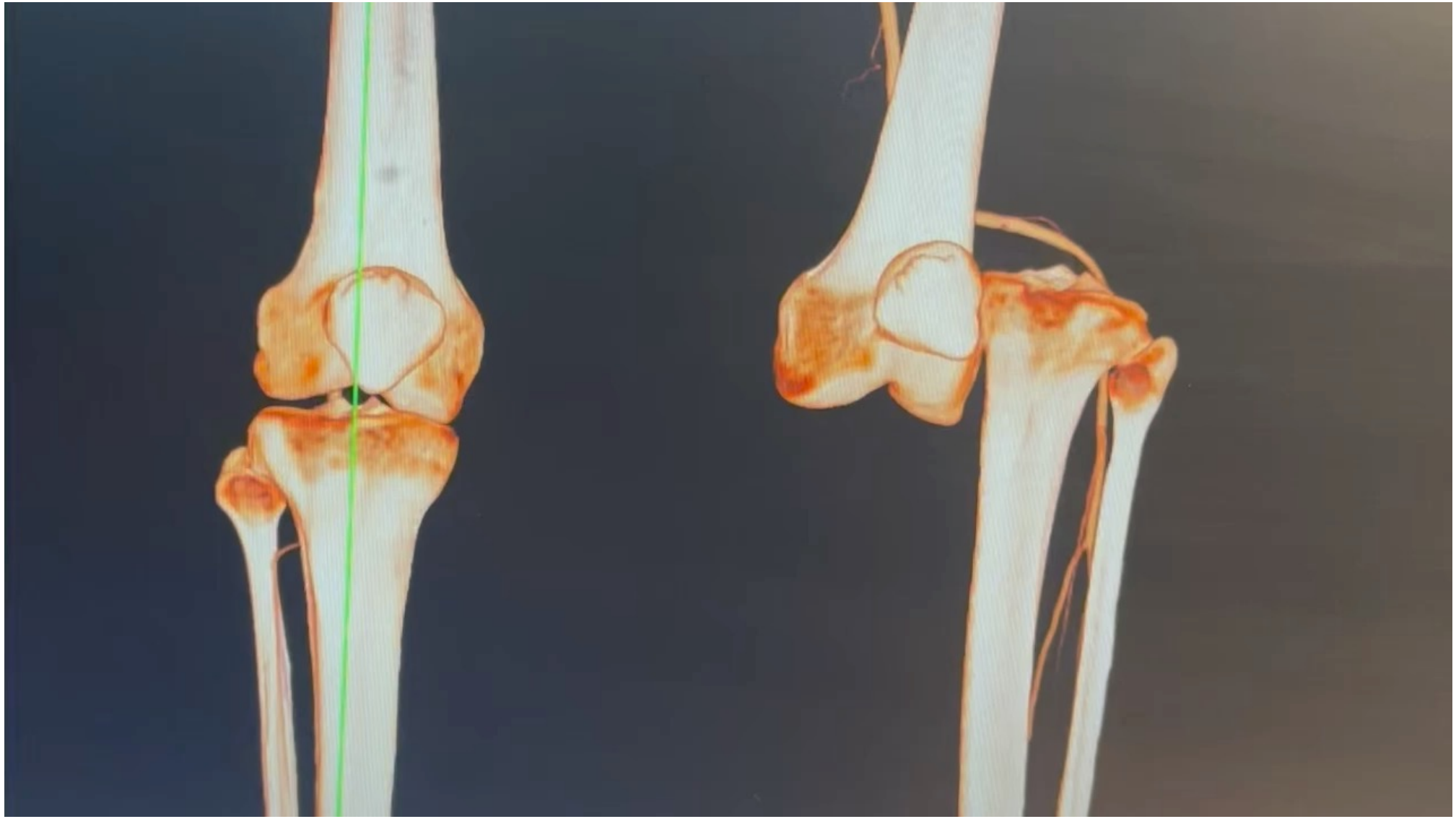

# Both cruciate & Both collateral ligaments



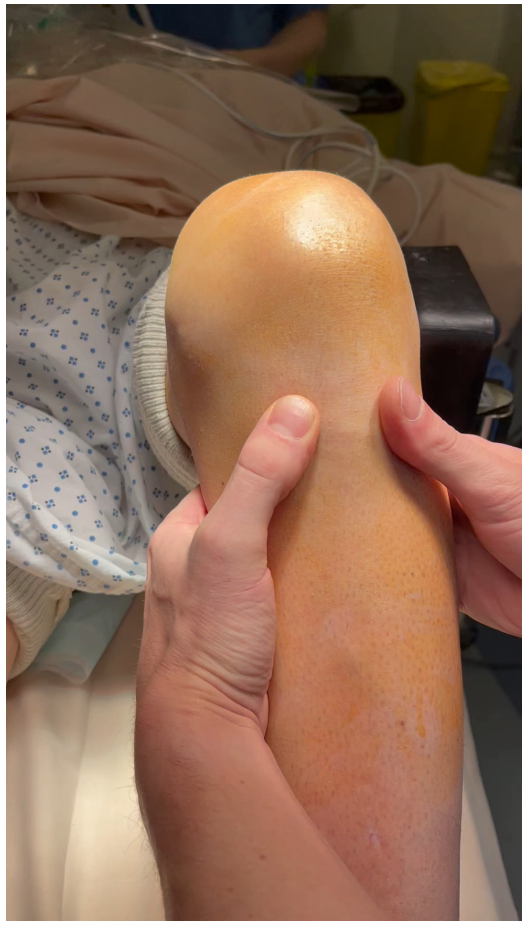
# Knee dislocation: MLKI

# Knee dislocation in (my) real life

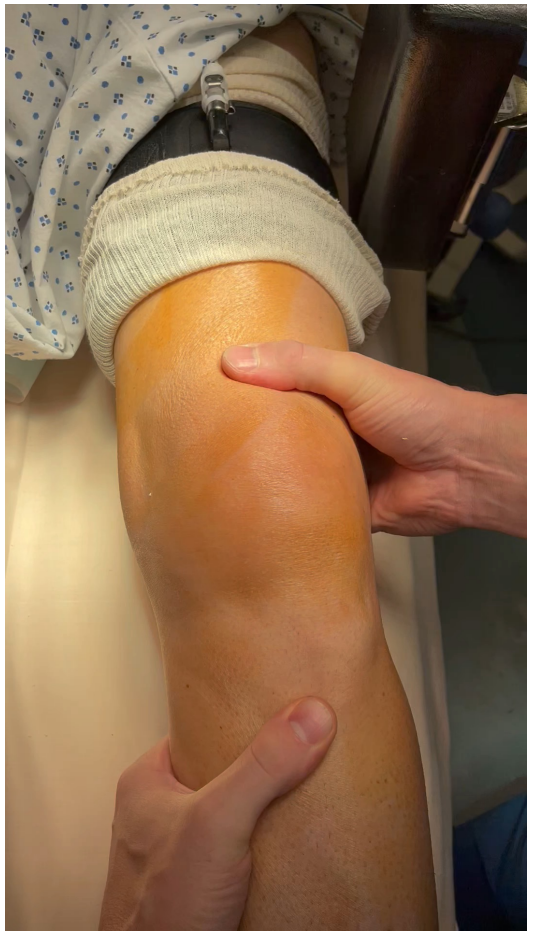
# MLKI KD IV



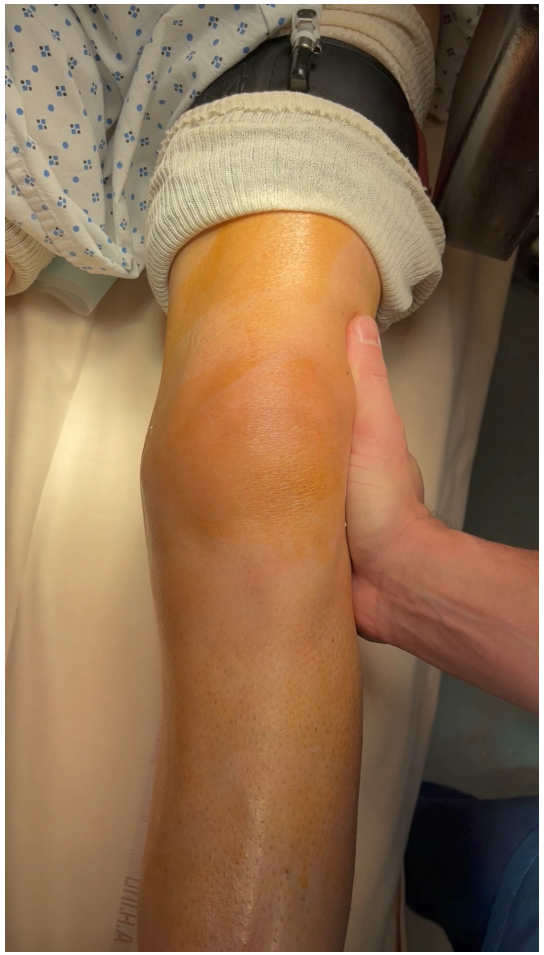
# MLKI KD IV



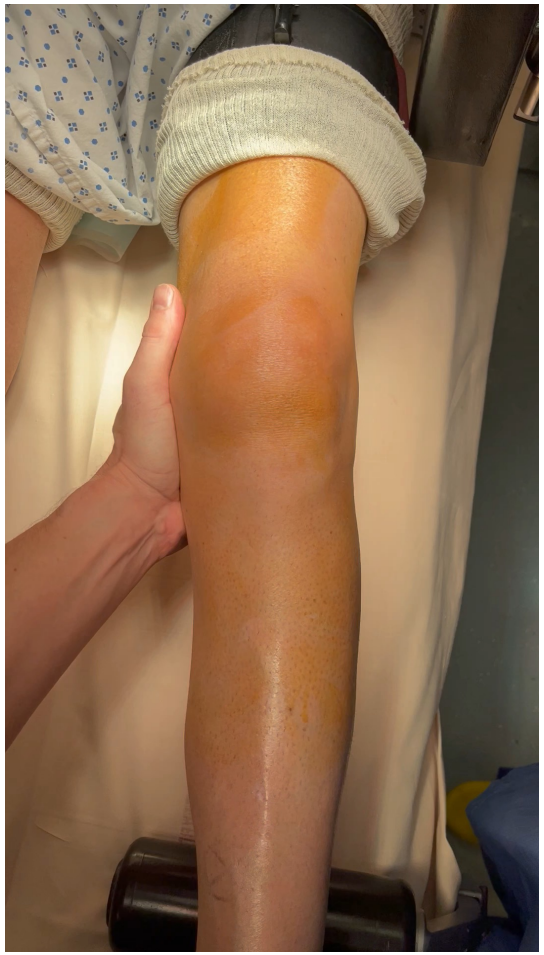
PCL



ACL



POL & MCL



LCL

## KD IV: ACL+PCL+MCL+LCL

- Very uncommon

- complex: associated lesion: neuro & vascular

- Difficult
- Emergency
- Need good strategy

# Epidemiology

- SORI with M. COOLICAN & D. PARKER

256 knees (1989 to 2017)

KD IV: 4%

- My own serie

96 knees (2019 to 2023)

KD IV : 9%

Clin Sports Med. 2019 Apr;38(2):235-246. doi: 10.1016/j.csm.2018.11.010. Epub 2019 Jan 19.

**Multiligament Knee Injury: Injury Patterns, Outcomes, and Gait Analysis**

Thomas Neri [1], Darli Myat [2], Aaron Beach [2], David Anthony Parker [2]

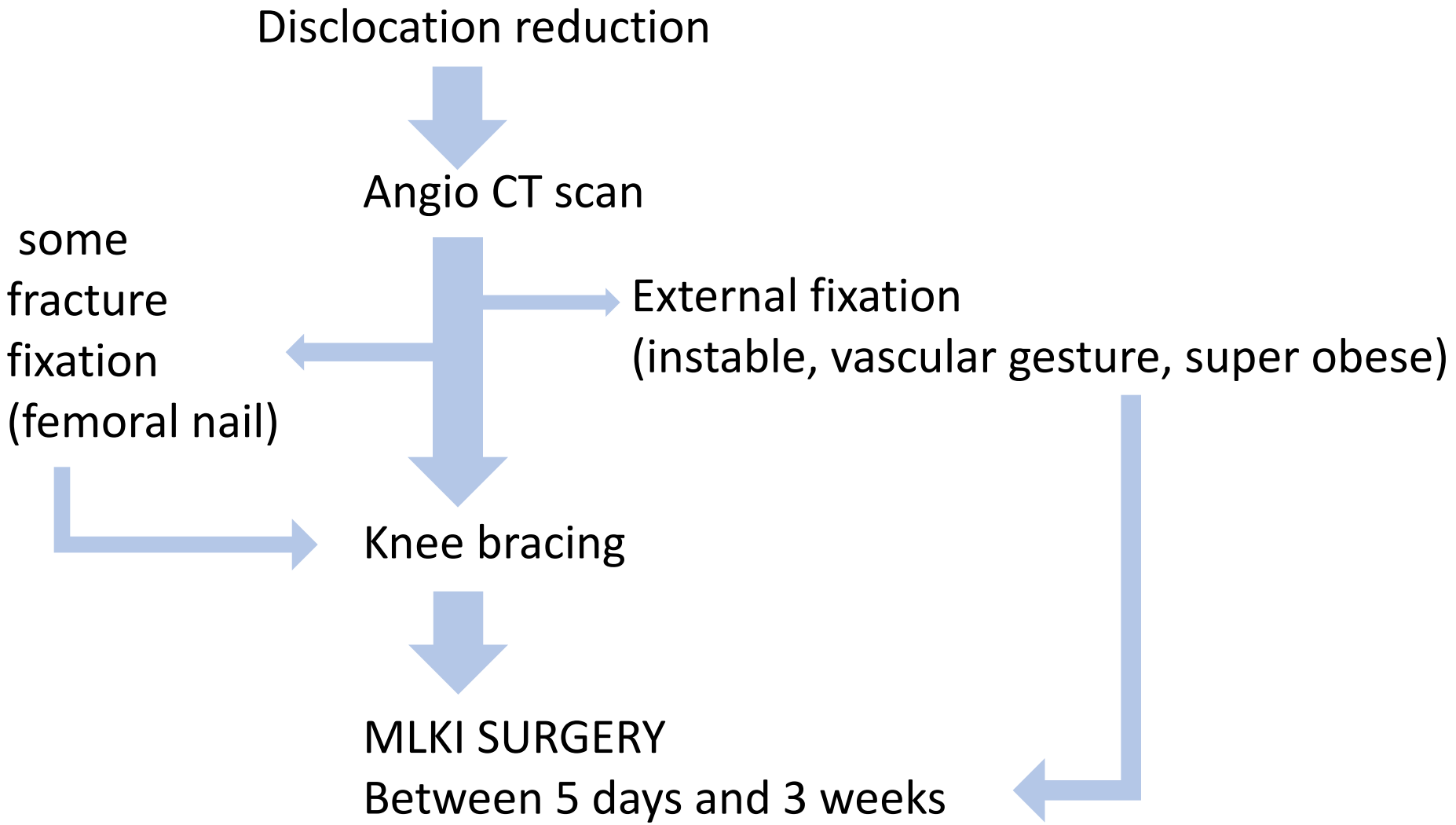
## Exams

- **Xray/ CT scaN** } Diagnostic
- **MRI** } Indication & Strategy
- **Vascular status**
  **CT angiography** } Complication +++

**CT angiography after reduction**

# Modalities –Strategy for knee dislocation KD IV

ACUTE TREATMENT



# Modalities –Strategy for knee dislocation KD IV

SUBACUTE
TREATMENT

Delayed visit
Already reduced
Vascular OK
Brace

Hinged Knee bracing
Rehabilitation in specialised center

MLKI SURGERY
BEFORE 3 months
When ROM is restored (aim: minimal 0-0-90)

# Modalities –ligaments

- **PLANIFICATION of MLKR**
  - **approach**
  - **Grafts choice**
  - **Timing**
  - **Surgical sequences**

# Modalities –Strategy for knee dislocation KD IV

Questions to ask when KD IV:

1- 1 TIME or 2 TIME?
2- ACUTE or DELAYED?
3- RECONSTRUCTION or REPAIR?
4- ALLOGRAFT vs AUTOGRAFT?
5- TUNNELS DRILLING : How to manage
6- ORDER OF FIXATION ?

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NO QUESTION
Don’t be afraid
1 time ++++



## Multiple-Ligament Knee Injuries: A Systematic Review of the Timing of Operative Intervention and Postoperative Rehabilitation

By William R. Mook, MD, Mark D. Miller, MD, David R. Diduch, MD, Jay Hertel, PhD, ATC, Yaw Boachie-Adjei, MD, and Joseph M. Hart, PhD, ATC

# Modalities –Strategy for knee dislocation KD IV

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**ACUTE +++ if you can**

BUT If you miss the delay
Easy to treat stiffness than laxity
rehabilitation first and when the ROM is restored -> Go for the surgery

# Modalities –Strategy for knee dislocation KD IV

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Arthroscopy. 2009 Apr;25(4):430-8. doi: 10.1016/j.arthro.2009.01.008.

**Decision making in the multiligament-injured knee: an evidence-based systematic review.**

Levy BA[1], Dajani KA, Whelan DB, Stannard JP, Fanelli GC, Stuart MJ, Boyd JL, MacDonald PA, Marx RG.

*Summary of Demographics and Functional Results in Studies Comparing Repair With Reconstruction of Damaged Structures in Multiligament Knee Injuries*

| | No. of Patients | | Mean Age (yr) | | Mean F/U (mo) | | Mean Lysholm Score | | IKDC (% Excellent/Good) | | Failures | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Study | Repair | Recon | Repair | Recon | Repair | Recon | Repair | Recon | Repair | Recon | Repair | Recon |
| Stannard et al.[27] | 35 | 22 | 31 | 36 | 33 | 33 | 88 | 91 | 71 | 77 | 37% | 9% |
| Mariani et al.[28]* | 17 | 6 | 25 | 35 | 83 | 83 | 85 | 85 | 24 | 25 | NR | NR |
| Total | 52 | 28 | 28 | 36 | 58 | 58 | 87 | 88 | 48 | 51 | 37% | 9% |

Abbreviations: F/U, follow-up; Recon, reconstruction; NR, not reported.
*Repair groups 1 and 2 were combined for greater clarity.

**Failure rate 37 %**

REPAIR: bony avulsion, medial side

RECONSTRUCTION ++++

# Modalities –Strategy for knee dislocation KD IV

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**Allografts** play an important role in this multi-ligament context
Numerous studies report excellent clinical results with allografts

My experience: **Autograft for intra** and **allograft for extra**

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KD IV:

- Femoral tunnels: 6 tunnels
- Tibial tunnels: 5 tunnels + 1 fibula

- Main issue: tunnels collisions

Especially damage intra-articular grafts

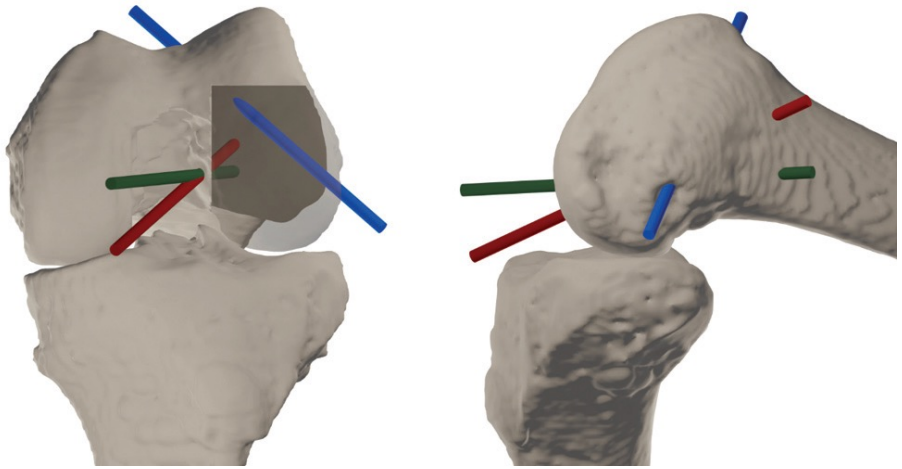
Tips & tricks

- Start by the extra-articular tunnels

Without passing the grafts

- Do then the intra-articular grafts

-> No risk to damage intra-articular grafts



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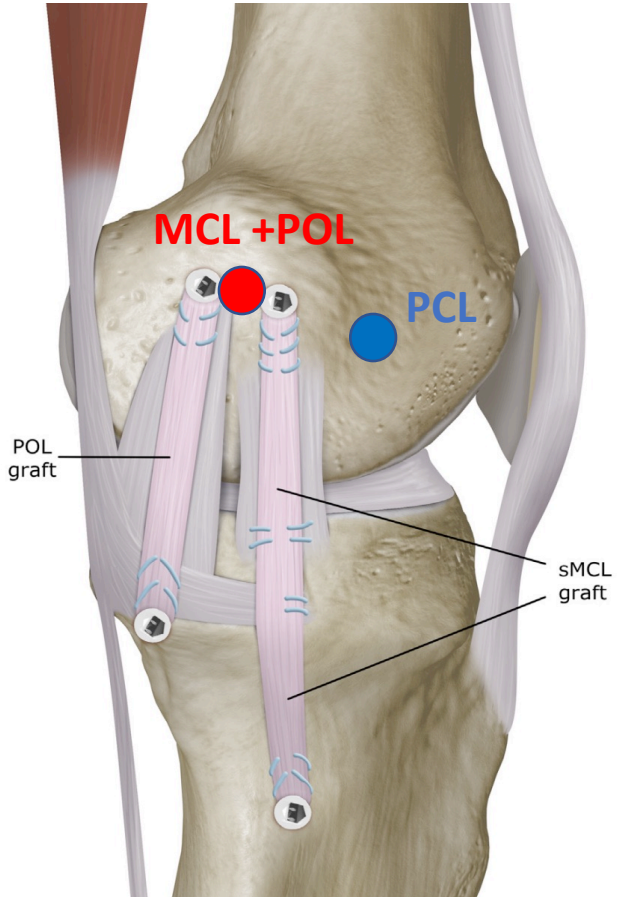
- Be less anatomic

- only 1 femoral tunnel of MCL and POL: avoid collision with PCL



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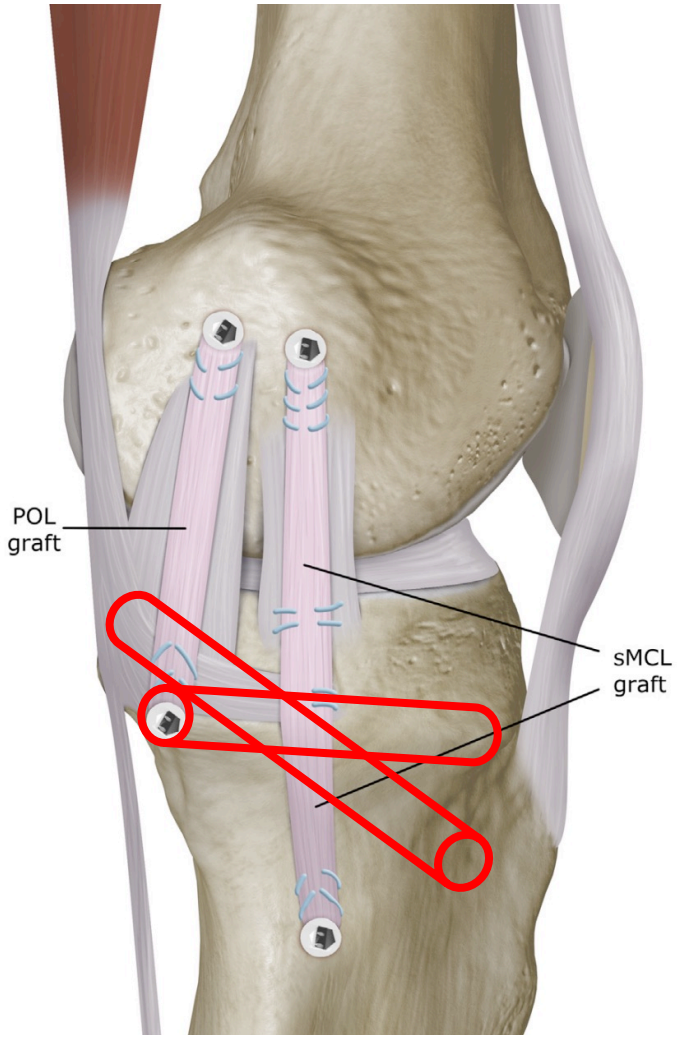
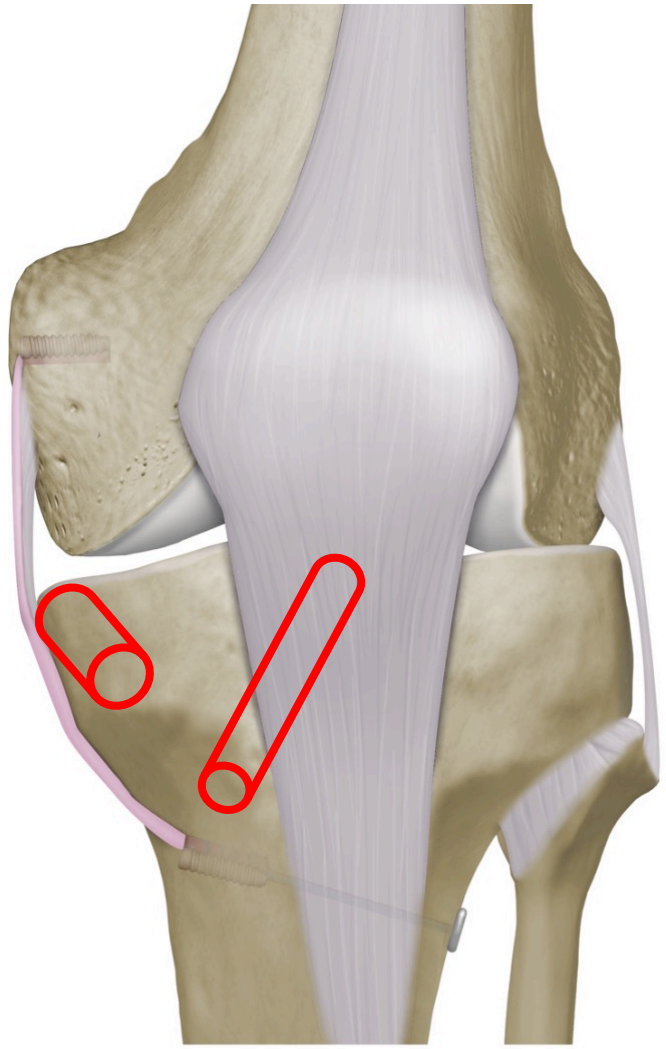
be carreful between tibial tunnel of PCL and POL
2 options: swivelock for POL
postero-anterior tunnel for POL



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**6- ORDER OF FIXATION ?**

VERY IMPORTANT
Objective: Restaure knee joint center

**1- Fixation intra-articular grafts**

ACL in full extension: certain to be reduced

PCL at 90° of flexion

**2- Fixation of extra-articular grafts**

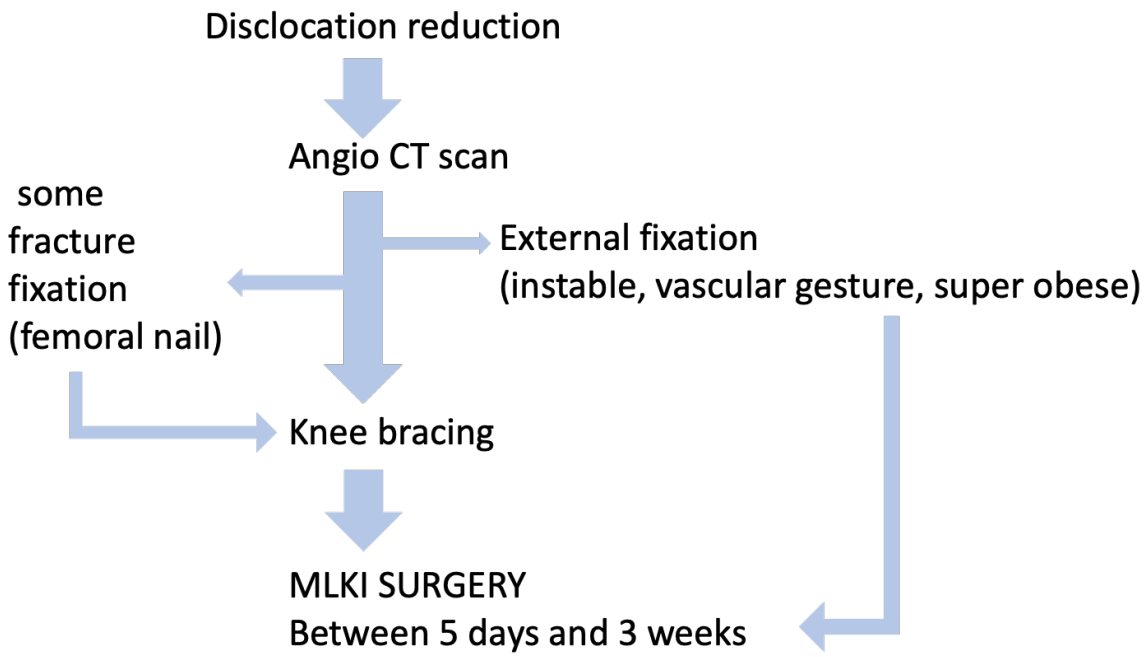
POL in full extension (medial side= stability compartiment

MCL at 30° of flexion

LCL at 30° of flexion

TP at 90° of flexion

## ACUTE TREATMENT




## SUBACUTE TREATMENT

Delayed visit
Already reduced
Vascular OK
Brace

Hinge Knee bracing
Rehabilitaion in specialised center

MLKI SURGERY
BEFORE 3 months

**1- lateral and medial approachs**
**Drilling extra-articular grafts**
Shuttle relais

**2- Drilling intra-articular grafts:**
First PCL (keep water)
Then ACL

**3- Fixation intra-articular grafts**
ACL in full extension: certain to be reduced
PCL at 90° of flexion

**4- Fixation of extra-articular grafts**
POL in full extension (medial side= stability compartiment
MCL at 30° of flexion
LCL at 30° of flexion
TP at 90° of flexion


*Thank you for your attention*