Diagnostic and treatment of deep MCL detachment.

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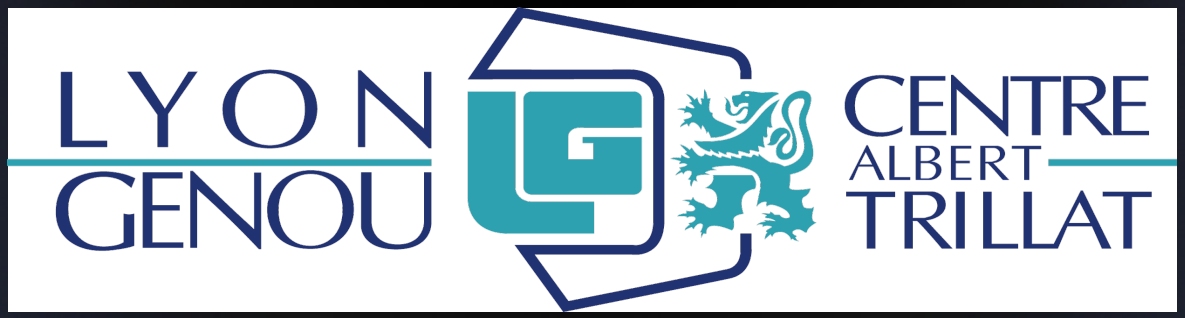


The authors of the next presentation have identified no following potential conflicts of interest.

Introduction.

- MCL injury is one of the most common knee injuries

Incidence : 0.24 - 7.3/1000 individuals per year.

Roach (Am J Sports Med. 2014)

- With a great potential to heal
- Early surgery may however be indicated for a major MCL injury with a multiple ligamentous injury.

Introduction.

But the deep MCL tears are an exception:

⇒ They cause persistent pain which prevents a return to high-level sports.

⇒ A precise diagnosis must be established

⇒ A surgical treatment can be thus indicated.

MCL

Three-layered structure

- Layer I (most superficial) : continuation of the fascia lata
- Layer II : superficial MCL
- Layer III : deep MCL

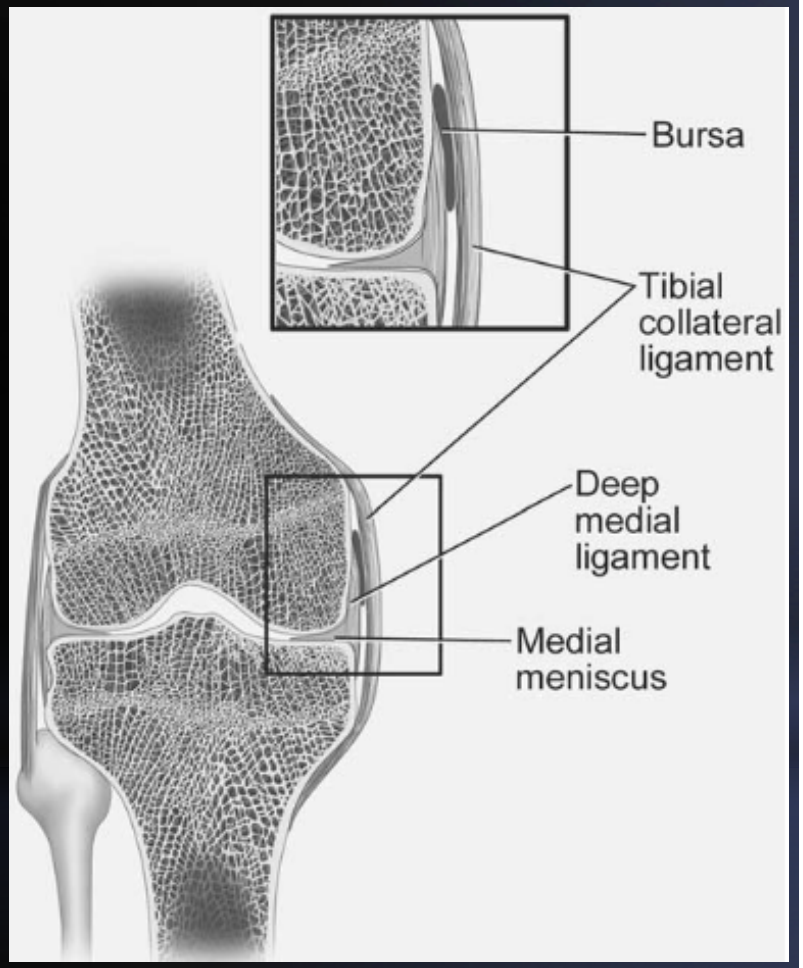
Warren (JBJS. 1979)

Indelicato (J Am Acad Orthop Surg. 1995)

Gianotti (Sports Med Arthrosc Rev. 2006)

Deep MCL

- More deep that the superficial MCL.
- Distinct but inseparable from the joint capsule
- Attached to the medial meniscus
- Width: 0.5-0.9 cm
- Long: 2.9-3.3cm
- Divided into meniscofemoral and meniscotibial components



Robinson (JBJS. 2004)

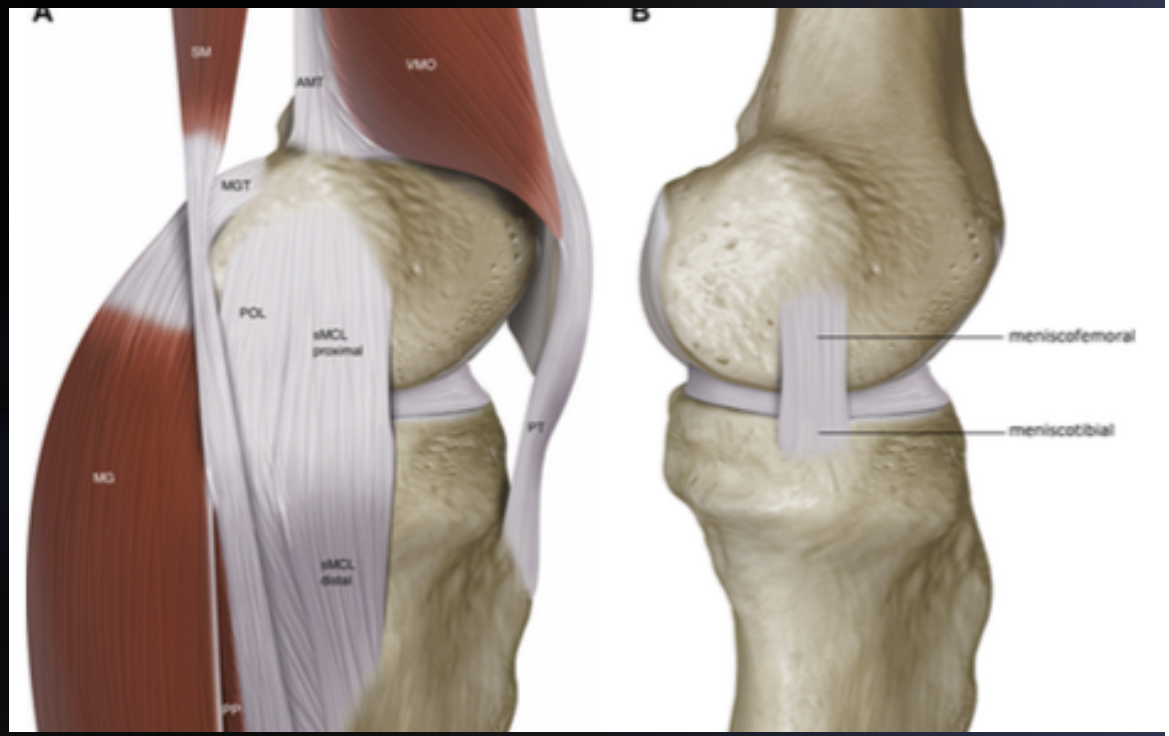
Deep MCL

✦ **Insertion**:

Immediately distal and posterior to the attachment of the superficial MCL, on the inferior aspect of the femoral epicondyle, 15 mm to 17 mm proximal to the margin of the femoral articular cartilage.

✦ **Terminaison**:

2 mm to 3 mm distal to the margin of the articular surface of the medial tibial plateau.



MCL function.

✦ **Deep MCL:**

- A secondary restraint to valgus load
- A restraint against external rotation torque

in knee flexed between 30° and 90°

⇒ Meniscofemoral portion : valgus stabilization at all tested flexion angles

⇒ Meniscotibial portion : valgus stabilization at 60° of knee flexion

Griffith (Am J Sports Med. 2009)

Robinson (Am J Sports Med. 2006)

Mr V. Michael

- 41 yrs old male
- 69 kg – 175 cm – BMI: 22.5

Right Knee

- Medical history :

1st sprain at 16 years old

2nd sprain in 2012

Difficulties to return to sports (foot) in 2013

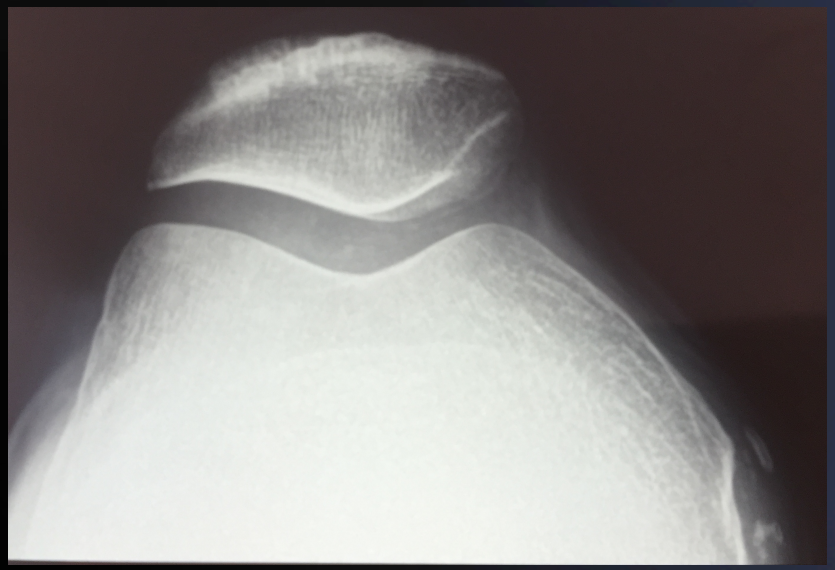
- Chronic and permanent pain since 2 yrs.

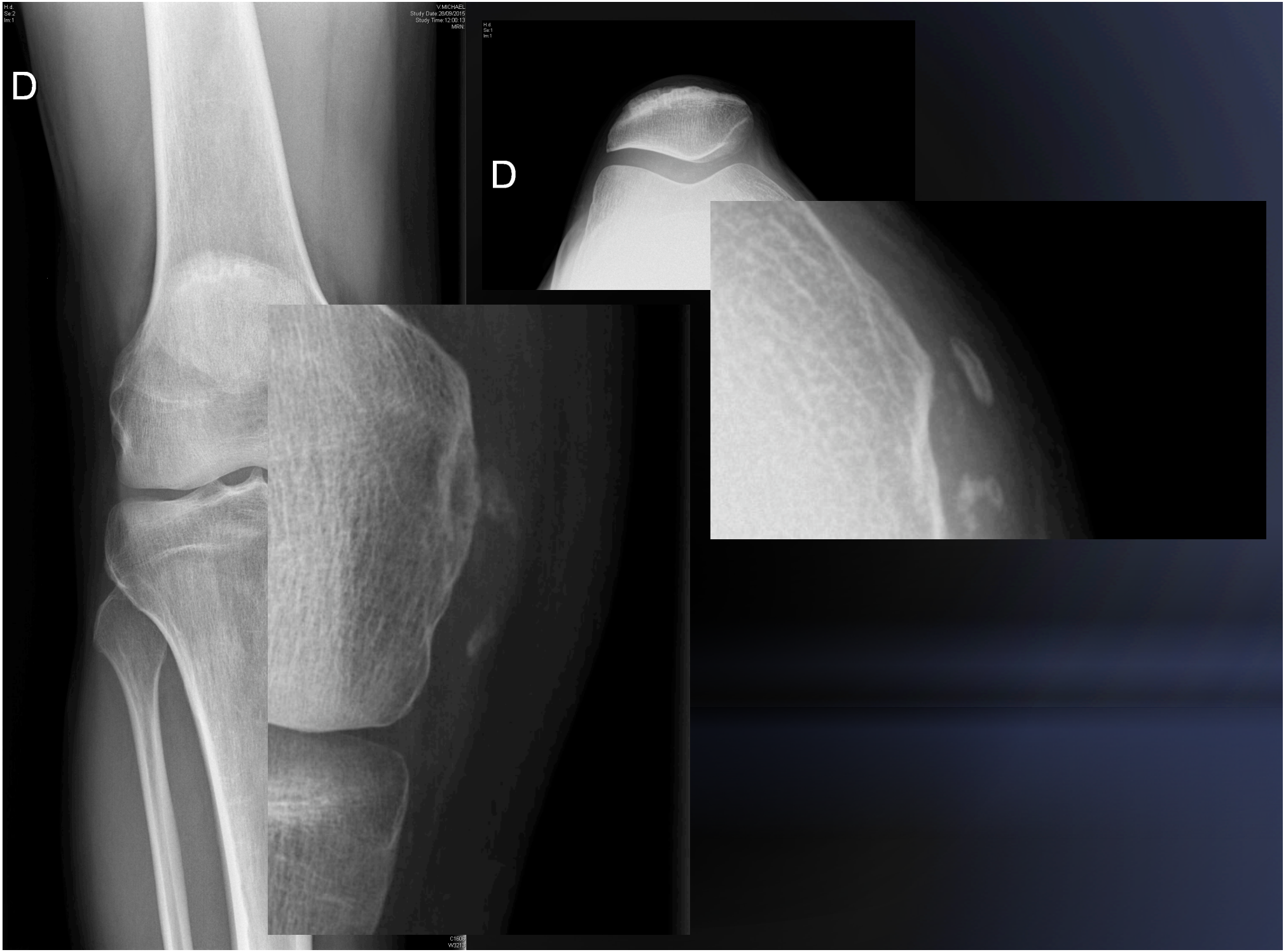
Mr V. Michael

- **Physical Examination**

  - Genu varum (0.5+0.5)
  - ROM: 2-0-140 (vs 2-0-145)
  - No frontal or sagittal laxity
  - Paroxysmal pain on MCL femoral insertion

Mr V. Michael

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Mr V. Michael

✦ **Echography:**

Ossifications in the MCL femoral insertion

⇒ **Diagnosis:**

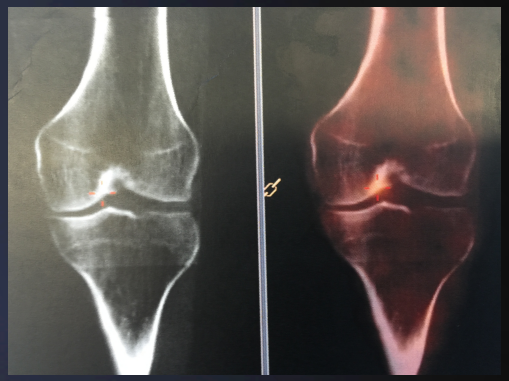
Pseudarthrosis of deep MCL on the femoral insertion

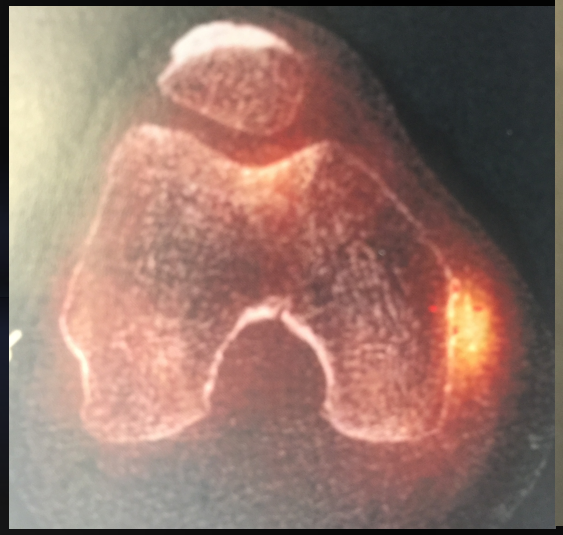
Pellegrini-Stieda syndrome

Mr V. Michael

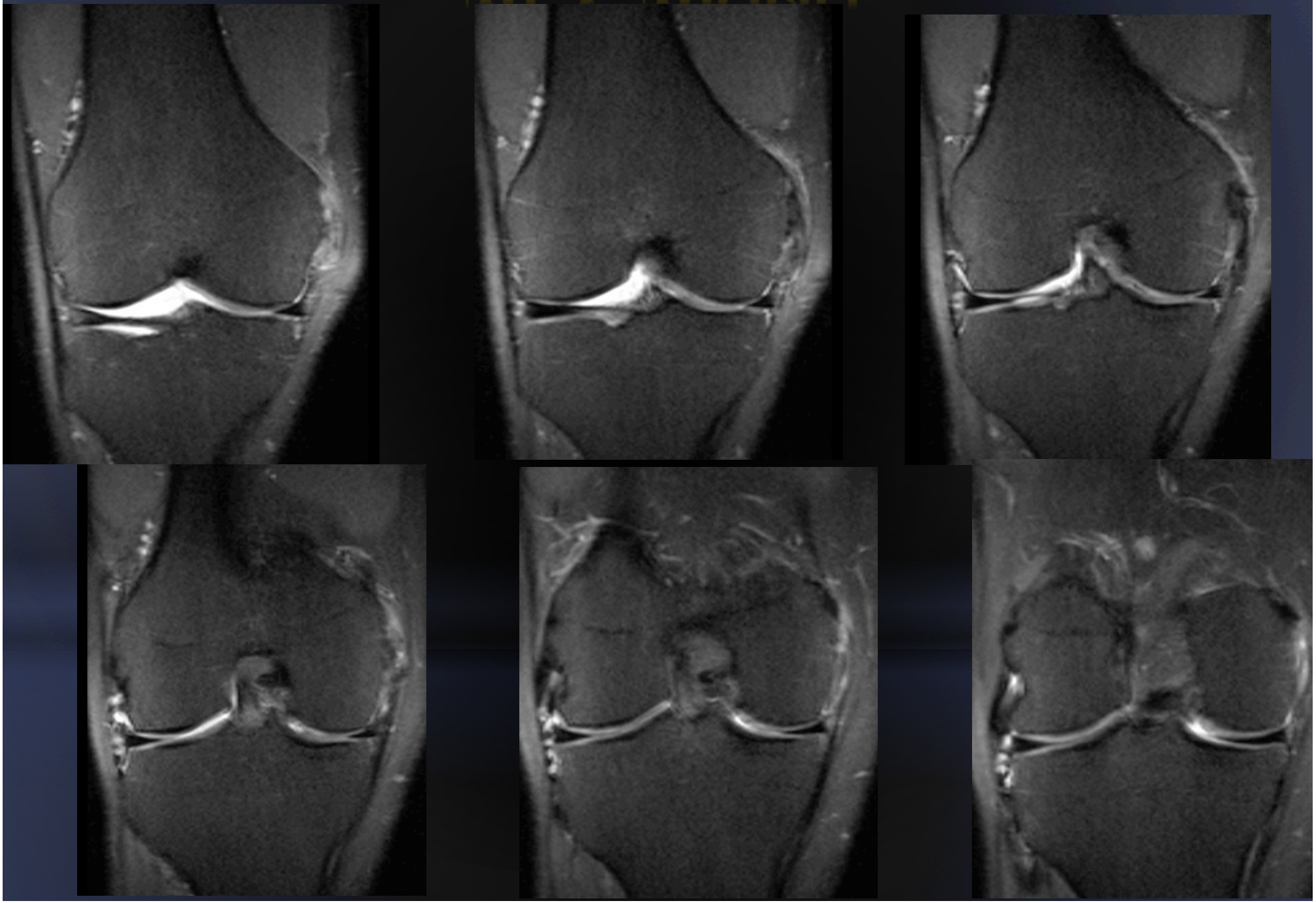
- **Bone scanning:**

Hyper fixation on the deep MCL femoral insertion.





Mr V. Michael



Mr V. Michael

- Treatment :
  - Arthroscopy first

  Cartilage, meniscus, cruciate ligament assessment

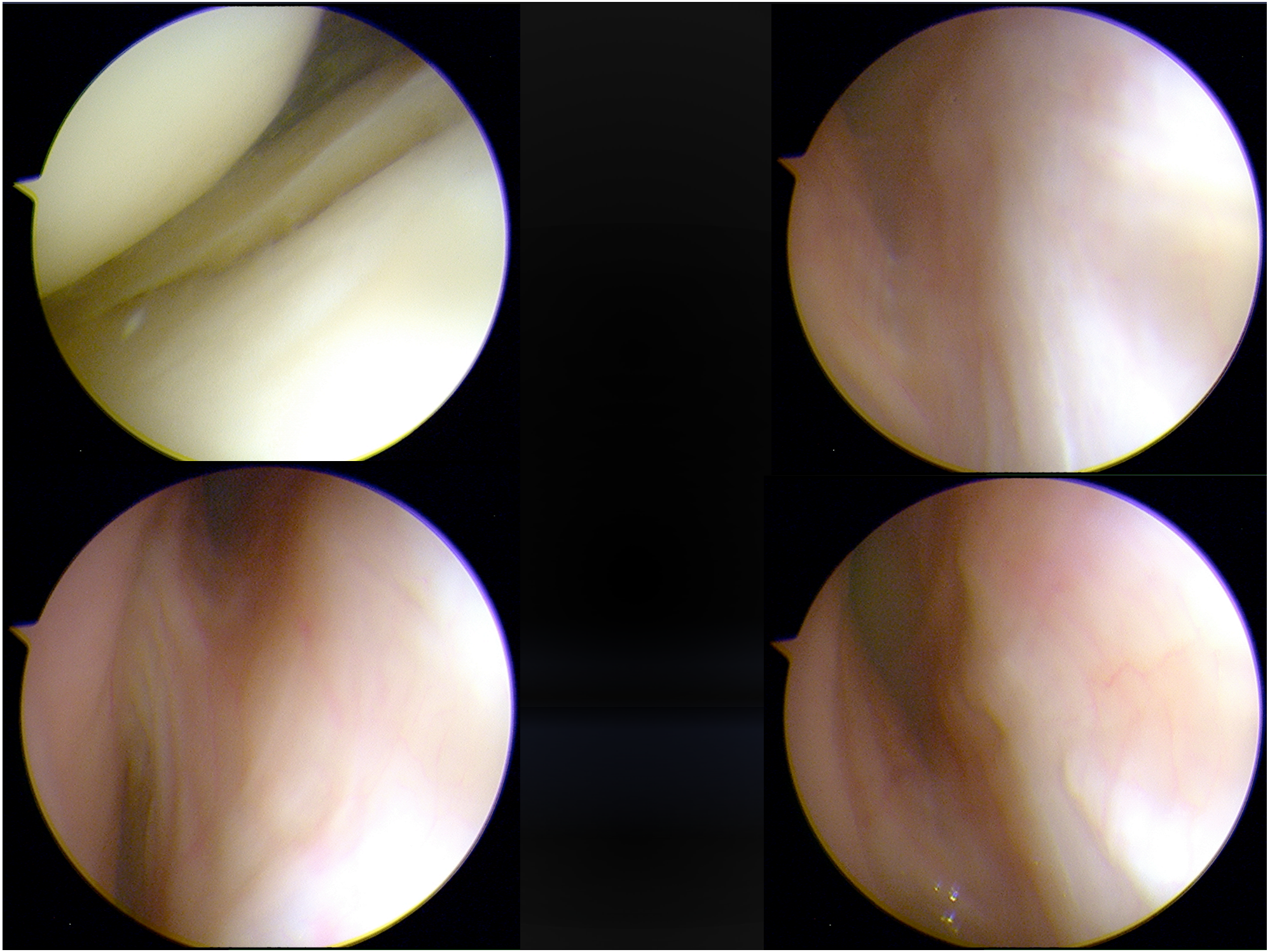
  Assessment of Opening of medial joint line

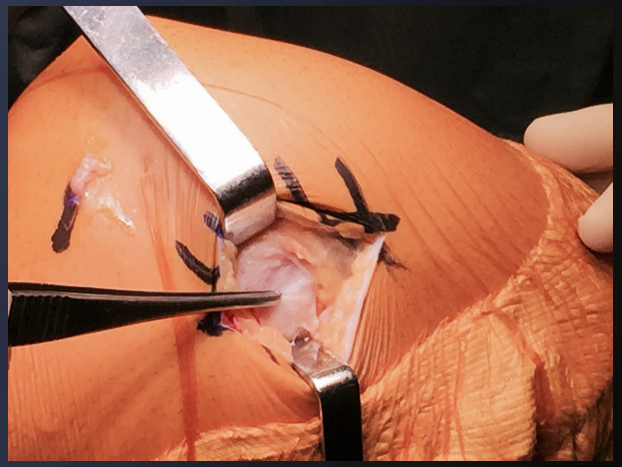
  - Medial approach

  Assessment of MCL calcification

  => Remove if only calcification

  => Bone fixation if MCL detachment.





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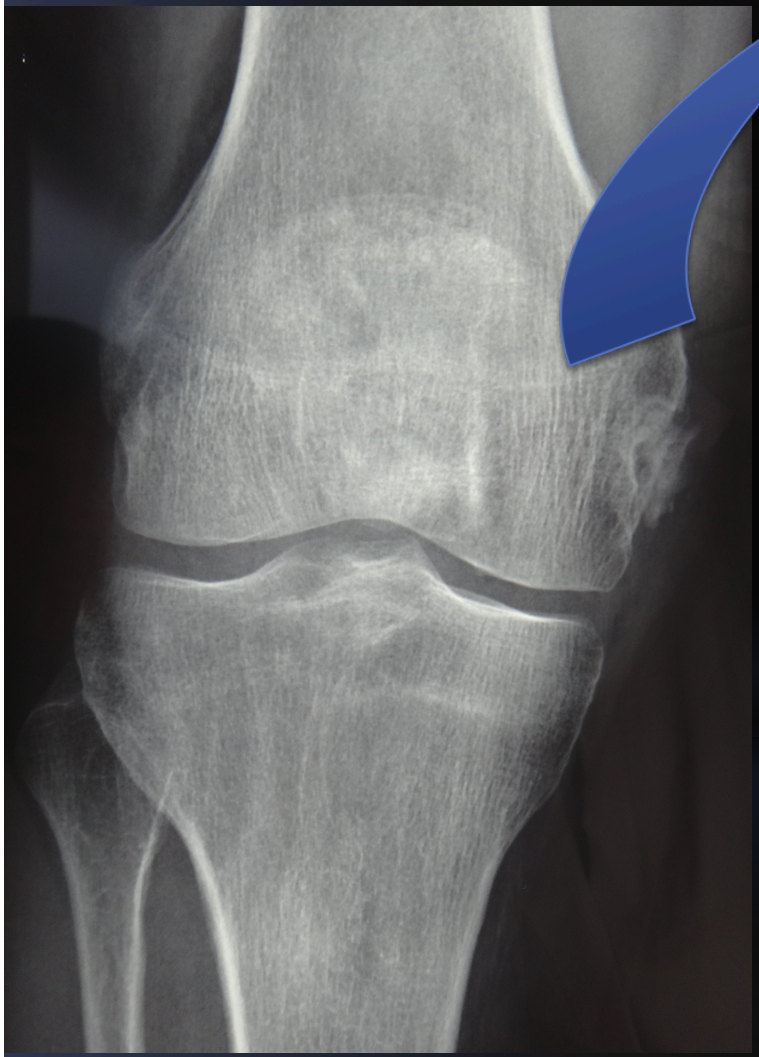

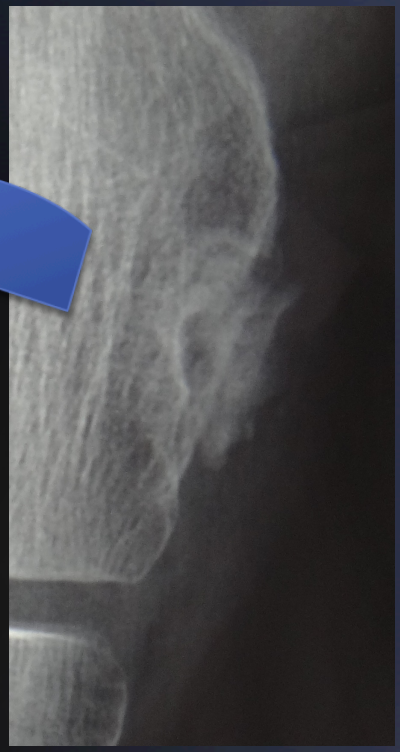

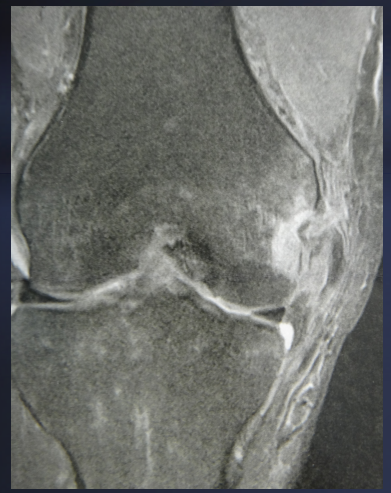



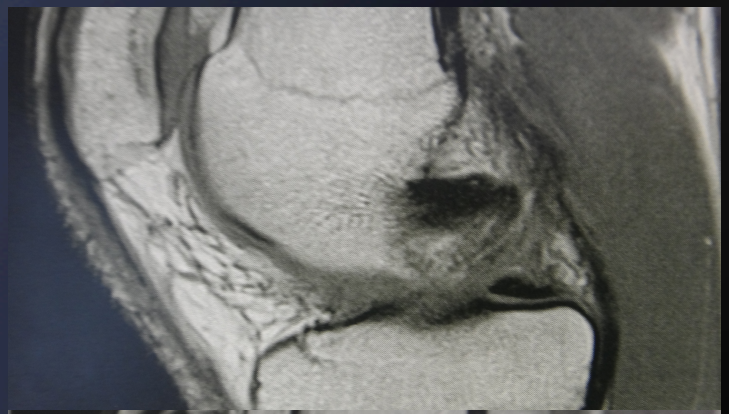

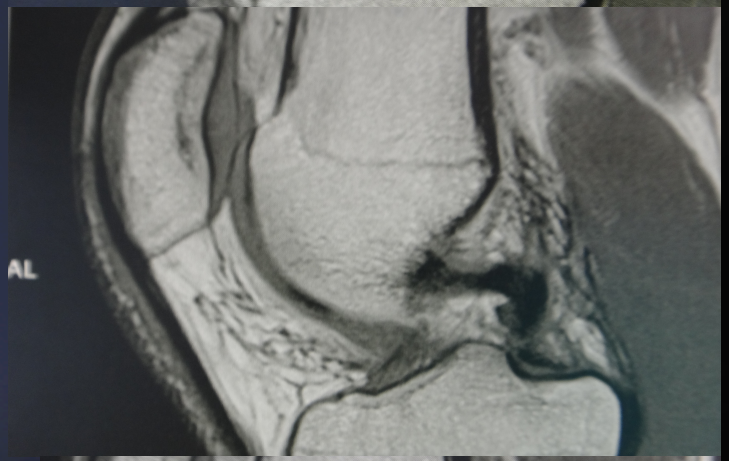
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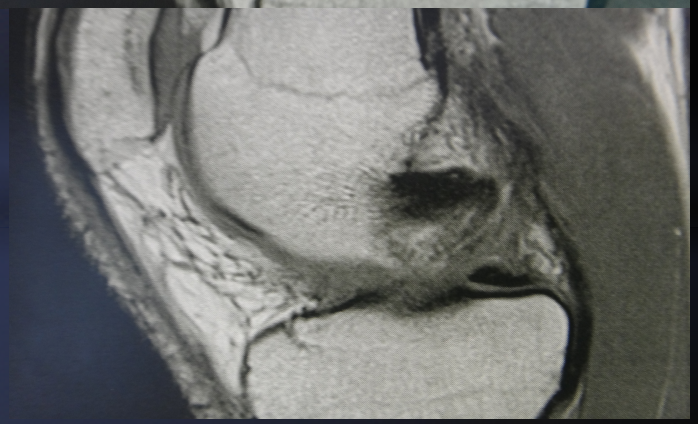
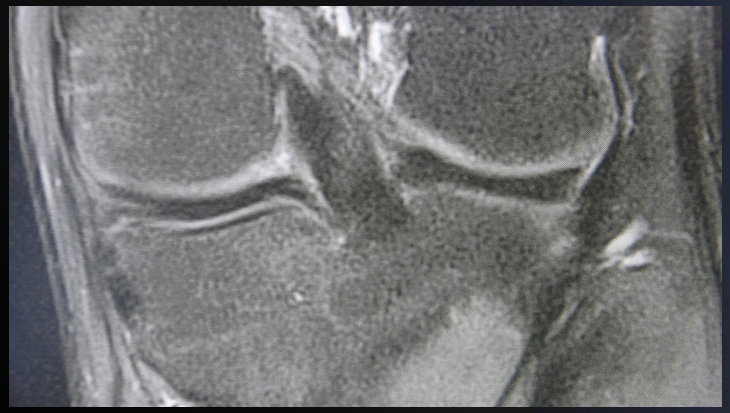
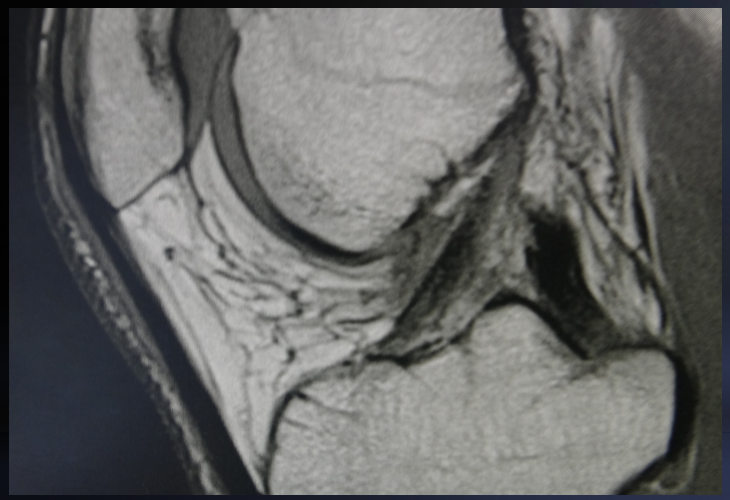
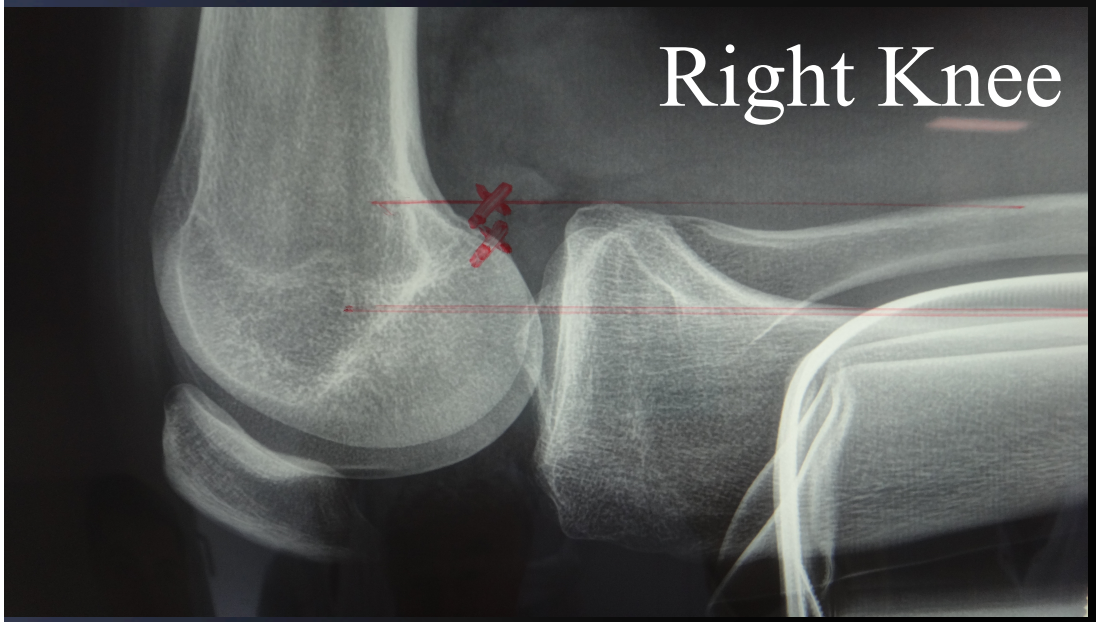
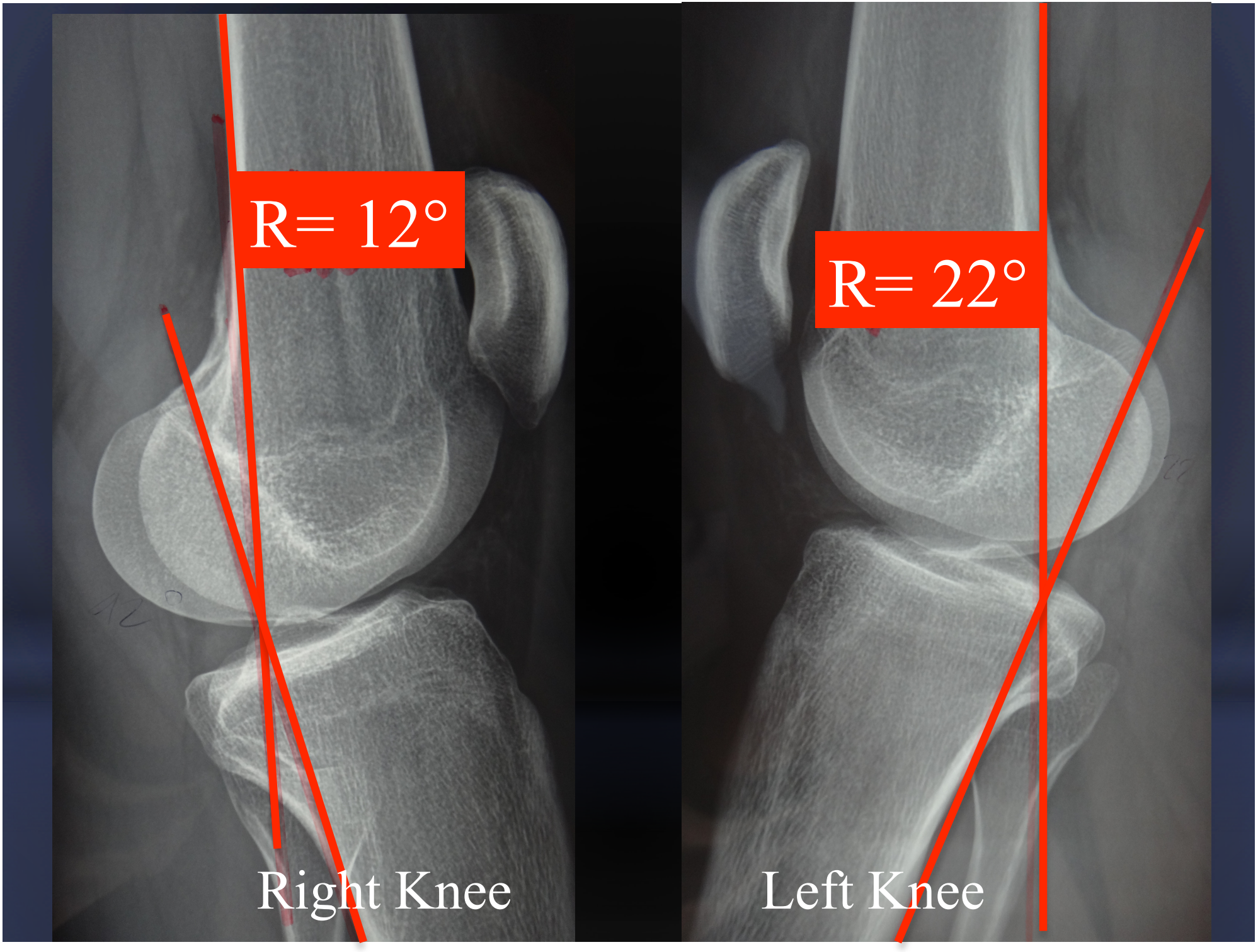


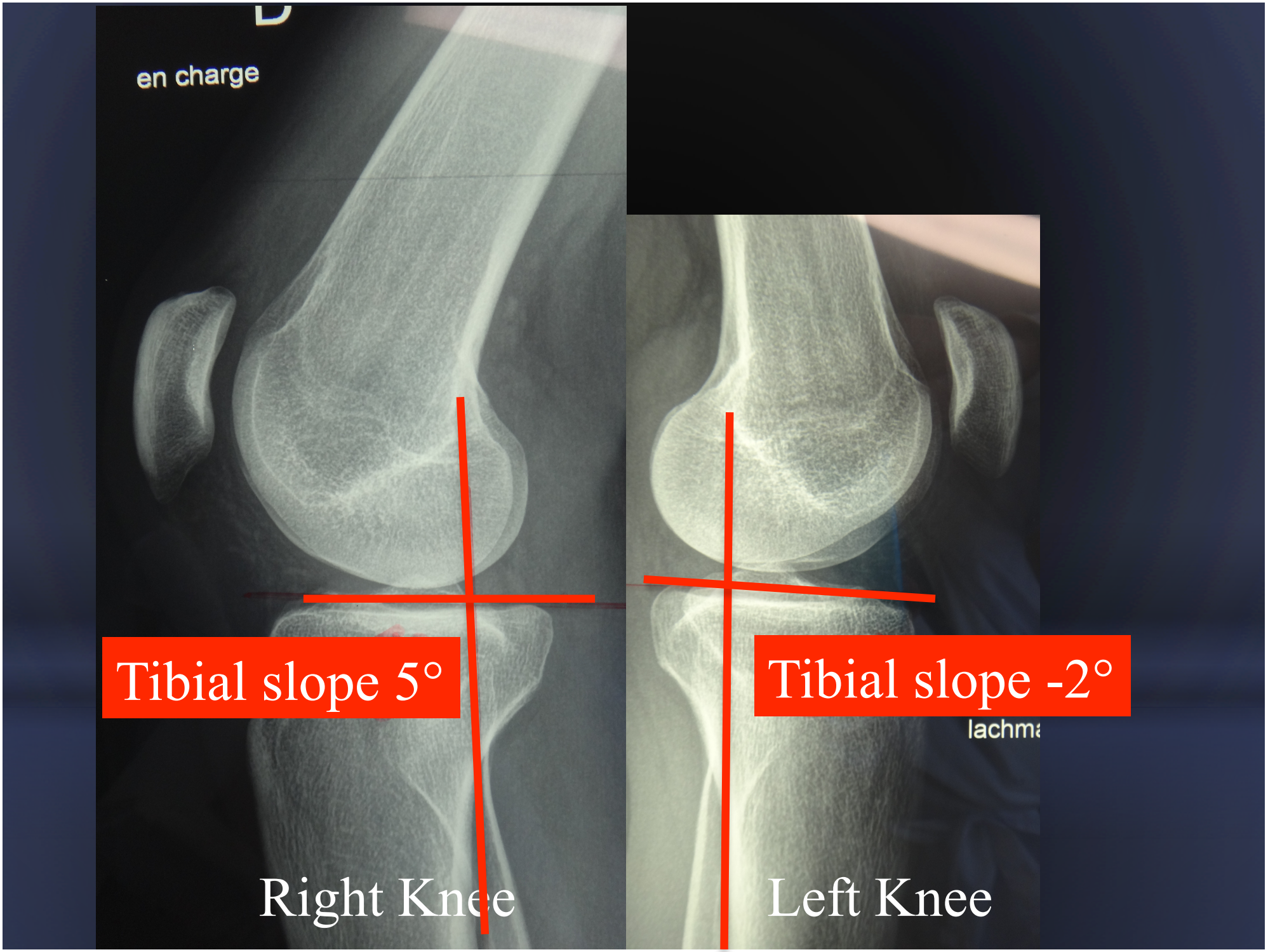






Bartlett view
No Posterior Translation


R= 12°
R= 22°
Right Knee
Left Knee


en charge
Tibial slope 5°
Tibial slope -2°
Right Knee
Left Knee

Deep MCL injury

✦ **Associated injuries:**

- Often isolated for low grade injury
- ACL injury : 20 % of MCL injury grade I
  : 76.9 % - 78 % of MCL injury grade III
- PCL injury: 11 % of PCL reconstructions
- Medial meniscus: 5-33 % of MCL injuries

Bonasia (Iowa Orthop J. 2012)

Delong (Arthroscopy. 2015)

Deep MCL injury
Conservative Treatment.

Acute isolated **grade I or II injuries**

⇒ Control of pain and swelling

(rest, ice, NSAIDs, physiotherapy)

⇒ Hinged knee brace for 3 weeks to avoid valgus stress

⇒ Immediate knee range of motion exercises

⇒ Early weight-bearing

Wijdicks (JBJS 2010)

Deep MCL injury
Surgical Treatment.

✦ Indications **In Acute** :

⇒ Associated meniscotibial ligament and destabilisation of meniscus

⇒ Associated ACL or PCL injuries (grade III).

⇒ Severe valgus alignement

⇒ Intra articular MCL entrapment

⇒ Large bony avulsions

Bonasia (Iowa Orthop J. 2012)

Wijdicks (JBJS 2010)

Deep MCL injury
Surgical Treatment.

✦ Indications **In Chronic:**

Persistent symptoms despite rehabilitation (grade I +/- II):
Pain or Instability

✦ Chronic laxity/pain by isolated MCL injury.

⇒ Location of tear:
Meniscofemoral or meniscotibial laxity
Bony avulsions
Ligament rupture near the bone

⇒ Assessment on MRI and by Arthroscopy
⇒ Guide the surgical treatment

Müller (Form, Function, and Ligament Reconstruction, 1982)

Deep MCL injury
Surgical Treatment.

✦ Surgical approach

⇒ Examination under anesthesia

⇒ Arthroscopic assessment to search associated lesions

(Perform quickly to minimize fluid extravasation)

⇒ Open surgery according to indication

⇒ A peripheral tear of medial meniscus is commonly seen and repaired (33%)

Bonasia (Iowa Orthop J. 2012)

Narvani (JBJS 2010)

Deep MCL injury
Surgical Treatment.

✦ Deep MCL repair.

- Medial incision from the medial proximal tibia to the medial femoral epicondyle
- Should repair from the deepest structure outward

- MF ligament tear: Sutures alone or suture anchors
- MT ligament tear: Suture anchors fixation

⇒ Repair of the deep structures is completed with the knee held in varus and full extension

⇒ Ligaments can be elongated, thus a tension sutures must be performed

Bonasia (Iowa Orthop J. 2012)
Narvani (JBJS 2010)

Deep MCL injury
Surgical Treatment.

✦ Deep MCL reconstruction.

⇒ Many techniques

⇒ Mainly used in superficial MCL and posteromedial corner tears

⇒ Autograft used: semitendinosus and gracilis tendons

⇒ Fixation by cancellous screw, interference screw or soft tissue washer

Bonasia (Iowa Orthop J. 2012)

Narvani (JBJS 2010)

Deep MCL injury
Surgical Treatment.

- Bony reattachment of MCL insertions

⇒ To restore ideal length and position of MCL insertion

⇒ Fixation by screw

⇒ Favorable prognostic, with often a good healing

⇒ If there is a purely ligamentous rupture, the screw and toothed wascher can be performed

⇒ The fixation will be with a satisfactory quality

Müller (Form, Function, and Ligament Reconstruction, 1982)

Deep MCL injury
Outcomes.

- **Deep MCL surgery.**
  - Complete recovery for all patients (n=17) at 12 wk
  - All patients asymptomatic at the last FU
  (mean fu 48 wk)
  - Full training possible at 12 weeks after operation.
  - Mean time to return to competitive sport: 17 weeks
  - 4 patients / 17 have a sensory deficit of the infrapatellar branch of the saphenous nerve

Narvani (JBJS 2010)

Conclusion.

- The isolated deep MCL injuries are rare, particularly the MCL detachment.
- They can cause chronic pain and instability, which prevent the return to high level sport.
- The diagnosis must be evoked.
- For chronic tears, the treatment must be surgical by a retension of deep MCL.


Niveau 3 : Hospitalisation Orthopédie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Deep MCL injury Rehabilitation.

- Early motion to reduce stiffness
- Brace in extension 6-8 wk
- Partial weight bearing with brace 6-8 wk
- Stationary bike after 8 wk
- Running progression program after 3-4 months
- Contact sport after 6 months

Narvani (JBJS 2010)

Deep MCL injury
Surgical Treatment.

✦ Narvani described for 17 deep MCL tears:

The deep MCL was torn just distal to its proximal attachment. No deep MCL insertion detachment.

✦ Surgery:

- Arthroscopy first: search occult injuries
- Repair persisting disruption of deep MCL
- or Transfer proximally of deep MCL femoral attachment
- or Bony reattachment by bone anchors

Narvani (JBJS 2010)