

Clinical and Imaging Assessment in Chronic Multiligament Injuries

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Definition of chronic Multiligament injury

- Anterior cruciate ligament (ACL)
- Posterior cruciate ligament (PCL)
- Medial / Posteromedial corner (PMC)
- Lateral / Posterolateral corner (PLC)

**Minimum
two major ligaments are
involved**

“From ACL + MCL to dislocation with severe ligament/nerve/vascular injury”

+ meniscus and cartilage injuries

2 different situations

Acute setting

- Urgent vascular assessment (23%-32% popliteal artery injury in knee dislocations)
- Urgent neurologic assessment (14%-40% peroneal nerve injury in knee dislocations)
- Ligament assessment



Chronic setting

- Ligament assessment
- Neurologic assessment
- Vascular assessment (intimal)



Clinical presentation

- Missed multiligament knee injuries from acute phase
- Missed concurrent ligament injury (i.e. ACL treated and not PCL)
- Missed mal-alignment (varus and PLC)
- Concomitant meniscal and/or cartilage injuries

Ligament injury patterns

- Medial-side injuries (41% - 52%)
- Lateral-side injuries (28%)
- Bi-cruciate injuries (5%)

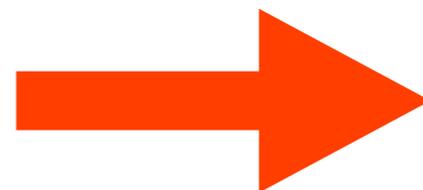


Moatshe G, Dornan GJ, Løken S, Ludvigsen TC, LaPrade RF, Engebretsen L. Demographics and Injuries Associated With Knee Dislocation: A Prospective Review of 303 Patients. *Orthop J Sports Med.* 2017 May 22;5(5)

Robertson A, Nutton RW, Keating JF. Dislocation of the knee. *J Bone Joint Surg Br.* 2006 Jun;88(6):706-11.

Aim of prep assessment

- Detail assessment of all injured structures
- Patient
 - Activity: sport, profession
 - Co-morbidity
 - Complaint and expectation



Planning of treatment

History

- Complaint: instability, pain, swelling, neurologic deficit, daily life or only sport
- Date of initial injury
- Previous surgeries



Clinical Assessment

Uninjured contralateral knee is used as a baseline for comparison

- Alignment
- Gait: **varus during gait**, footdrop
- Deformation / Skin
- Motion
- Laxity



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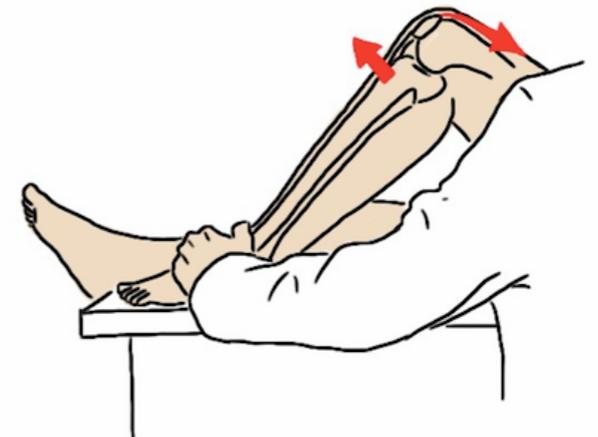


PCL assessment

- Posterior drawer test (sensitivity 90%, specificity 99%)

- Posterior sag test

- Quadriceps active test



- Supine internal rotation test

Grade	Posterior drawer
I	< 5 mm
II	5-10 mm
III	> 10 mm



MCL assessment

- The superficial MCL
 - largest component
- The deep MCL
 - thickened part of the medial joint capsule, lying deep to the superficial part of the MCL, with meniscotibial and meniscofemoral components
- The POL
 - additional medial knee restraint when the knee is extended

MCL assessment

- Primary restraint to valgus stability of the knee.
 - At 20–30° flexion: 80 % of the restraining force
 - At full extension 60 % of the restraining force with the posteromedial capsule, posterior oblique ligament (POL) and ACL providing the remaining restraint

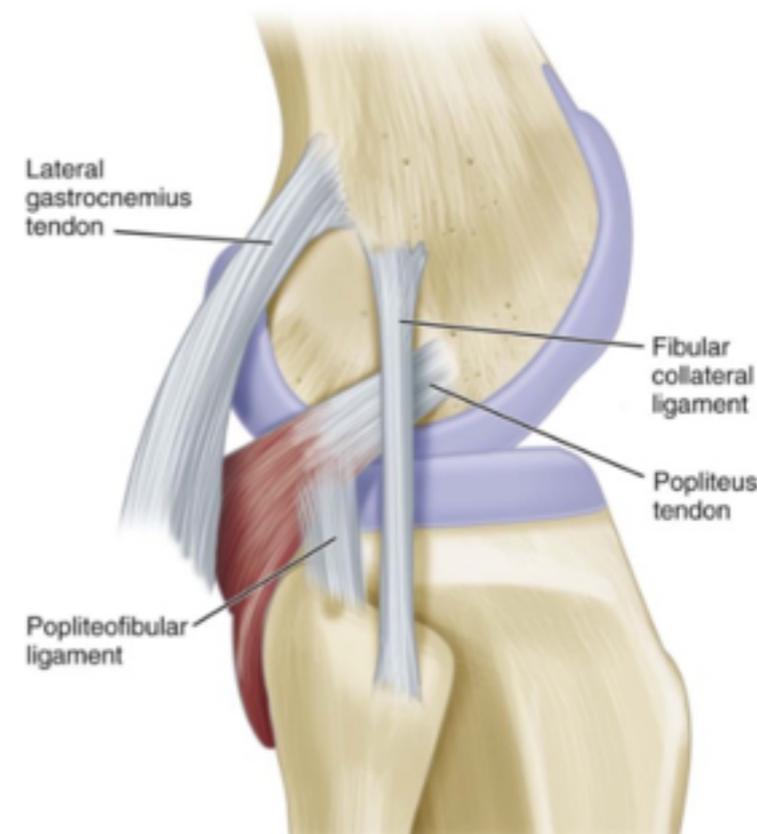
MCL assessment

- Valgus stress applied at 0° and at 20–30° knee flexion
- Grade 1: 3-5mm; Grade 2: 6-10 mm; Grade 3: > 10 mm
- Valgus laxity in extension: high suspicion of POL deficiency



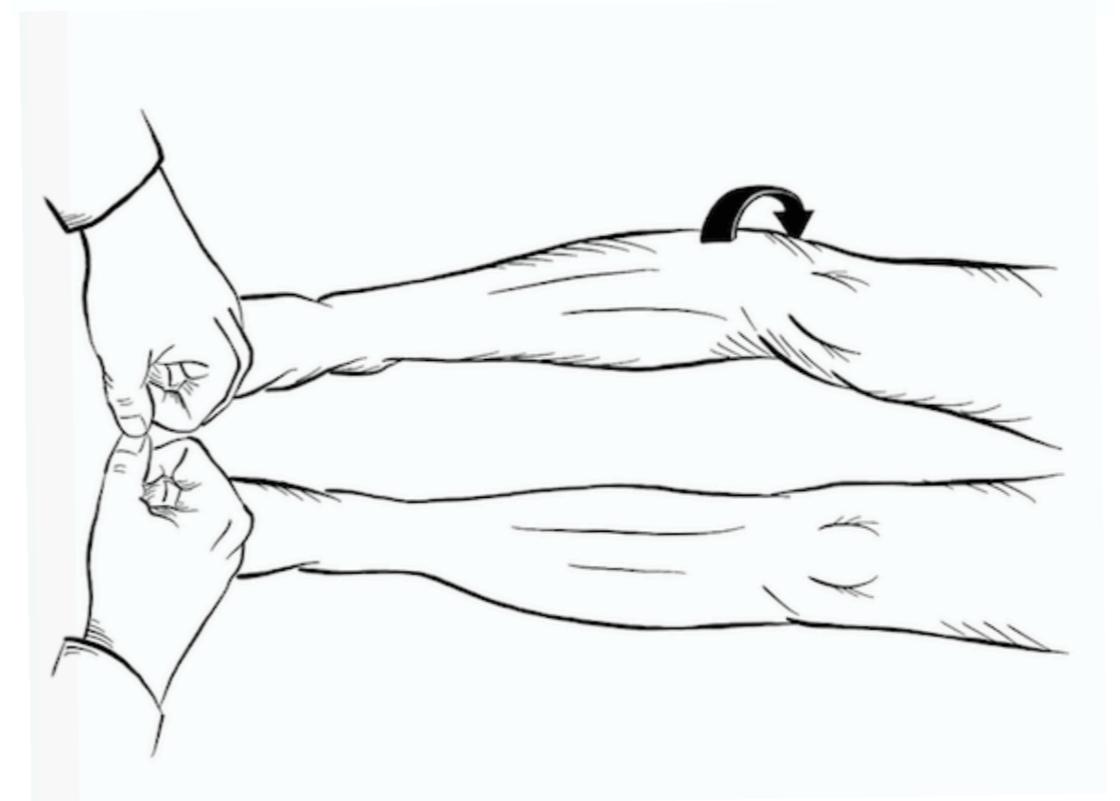
LCL and PLC assessment

- LCL, the popliteus tendon (PT), the popliteofibular ligament (PFL) and the posterolateral capsule which is reinforced by the arcuate ligament (AL)



LCL and PLC assessment

- Varus stress at both 0° and 30° of knee flexion.
- Dial test
- External rotation recurvatum test
- Posterolateral drawer test
- Reverse pivot shift test



ACL assessment

- Lachman
- Pivot shift



Instrumented measurement

- Anterior laxity: Arthrometer KT 2000, GNRB



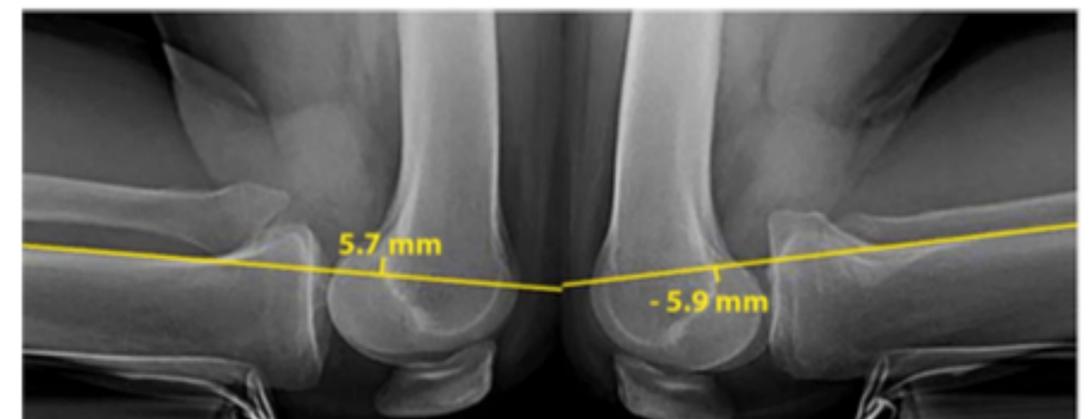
- Posterior laxity: "Telos",
Kneeling stress view

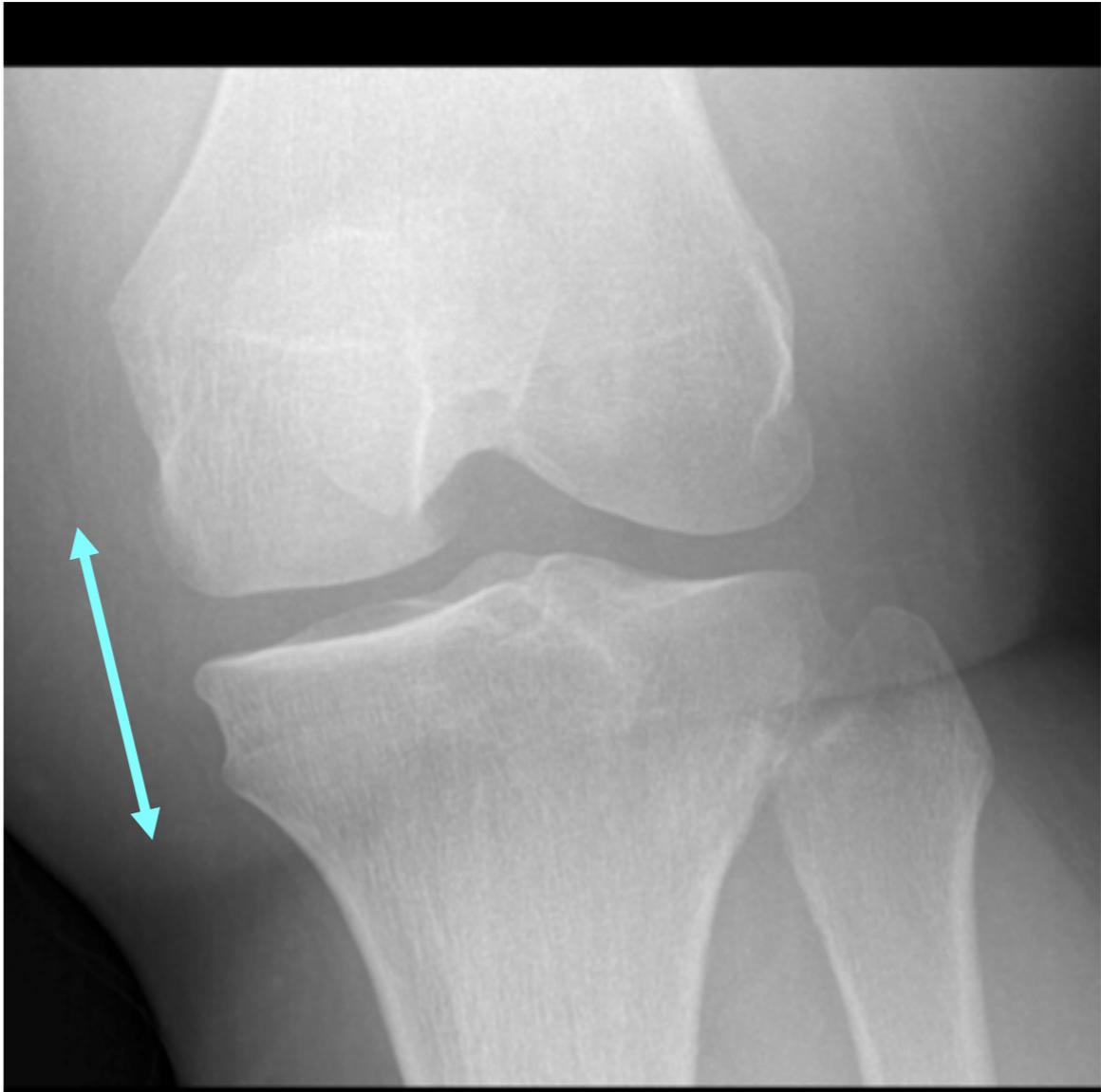


- Medial laxity: valgus stress radiography

- Lateral and postero-lateral: ?

- Other: KIRA, magnetic rotation evaluation





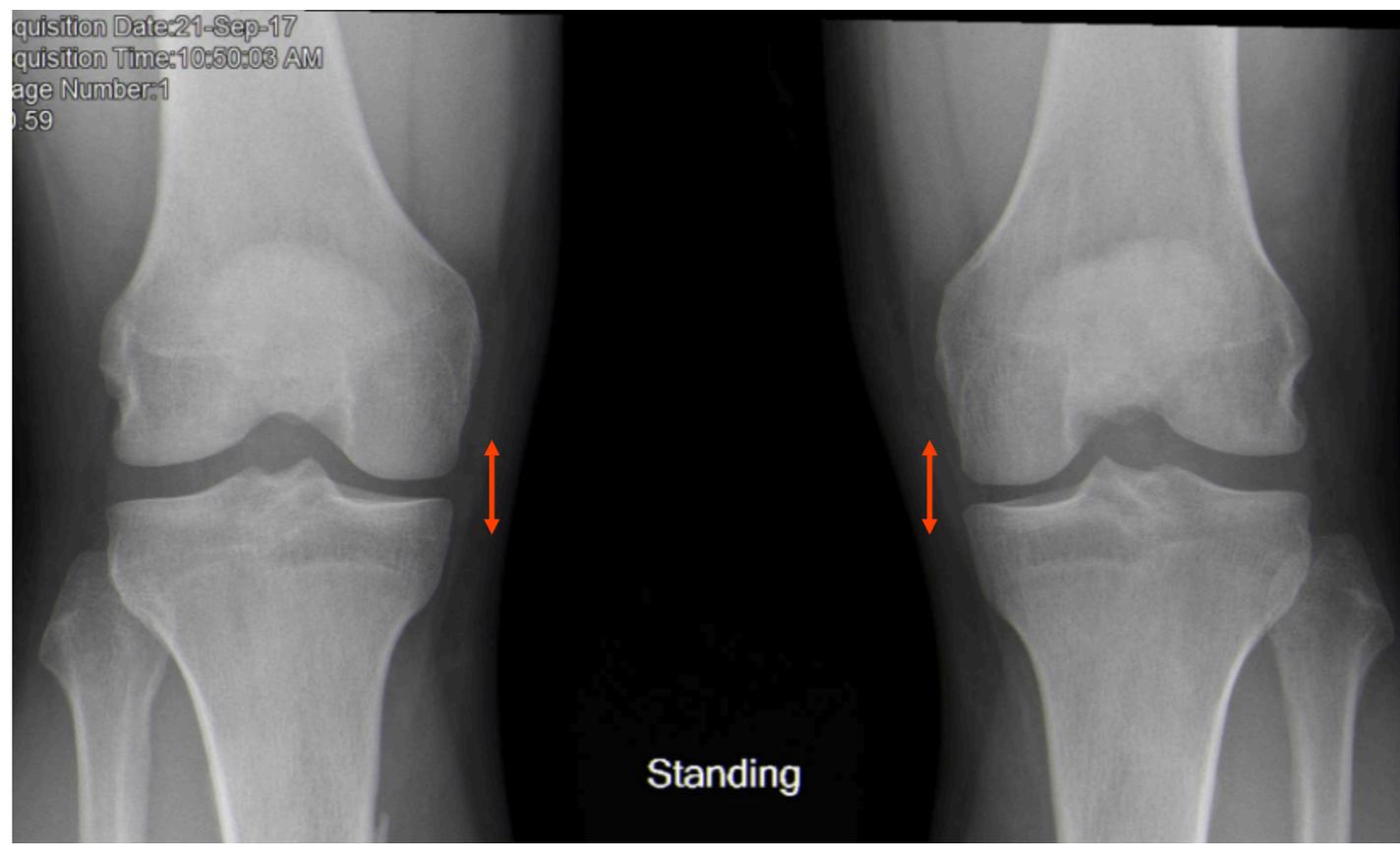
Imaging Assessment

- Alignment
- Ligament status
- Meniscal status
- Cartilage status
- Bone status

Imaging Assessment

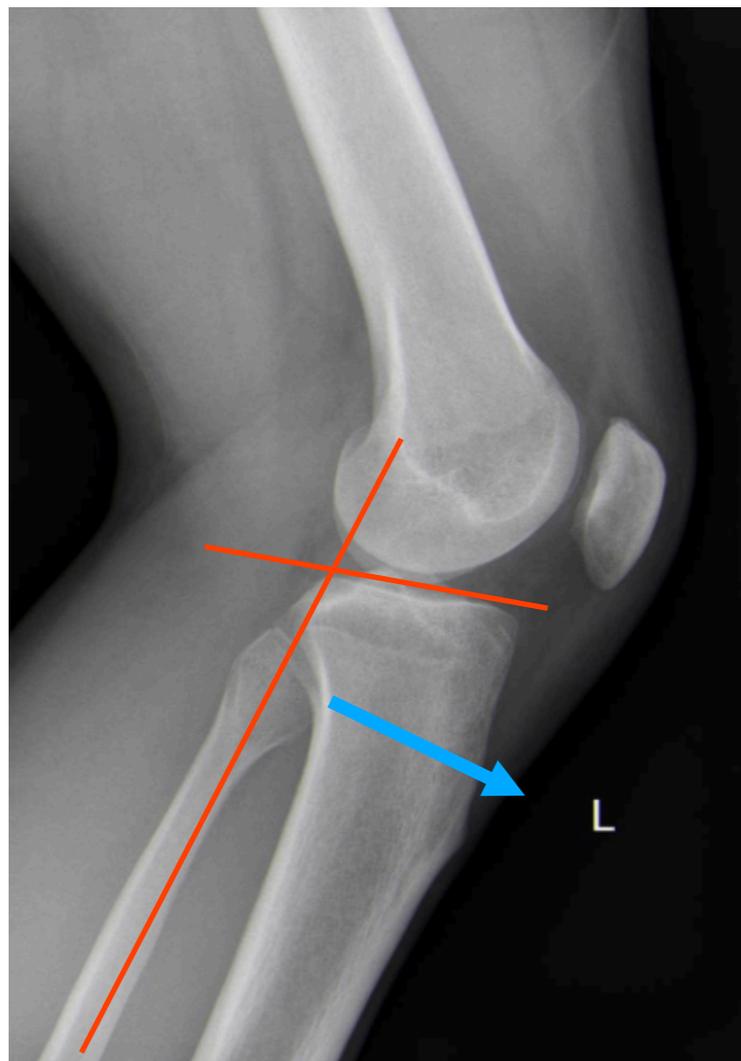
- **Standard X-rays**
- **Ortholeg (Telemetry)**
- MRI
- CT Scan





Standing

“Full study”

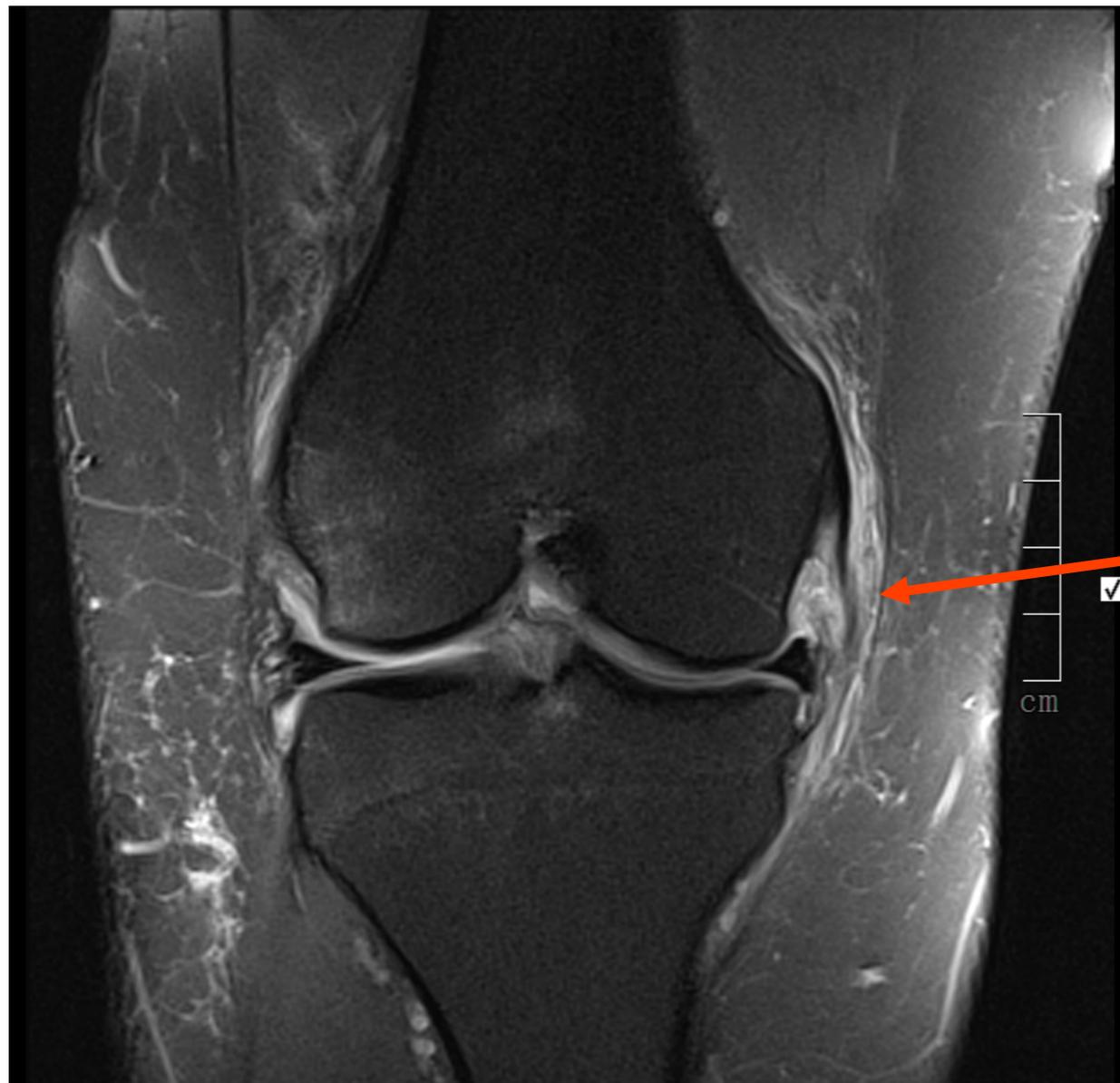
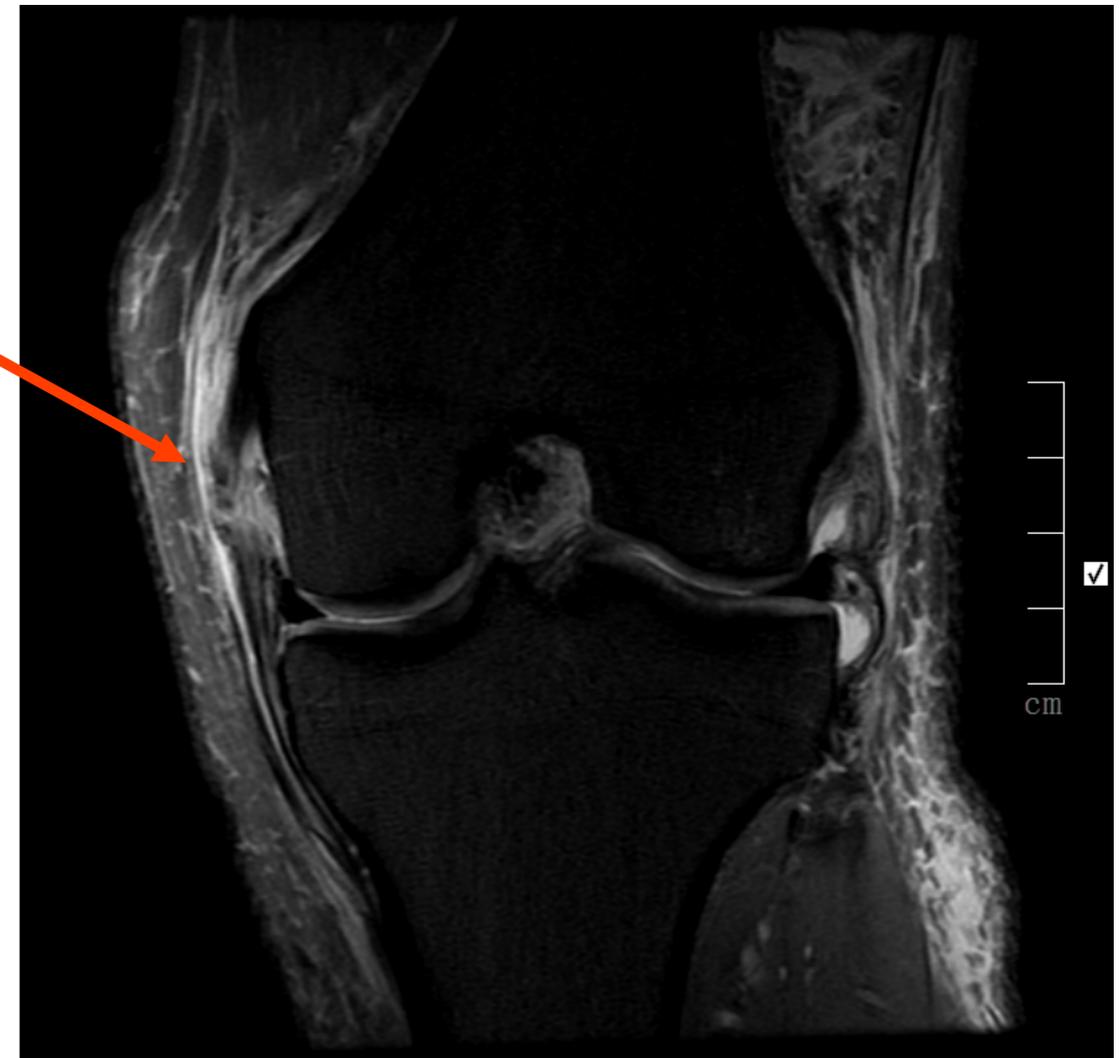


Second

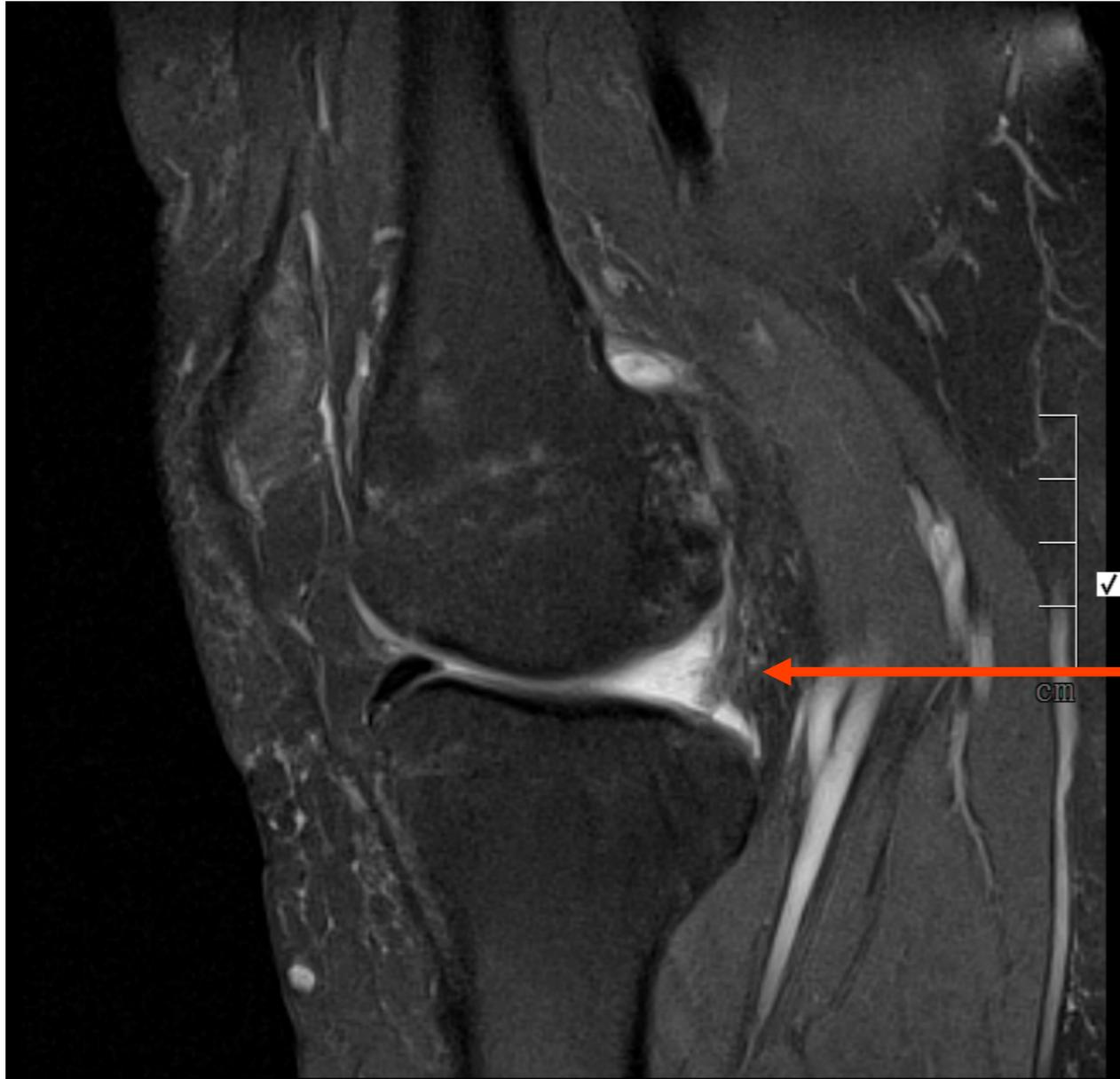
MRI

- Ligament injuries
- Meniscus injuries
- Cartilage injuries

**Complete tear
of the MCL ,
Grade III**



**Tear of the upper
meniscomfemoral ligament
(deep portion of MCL).
grade II**



Posterior medial meniscal root avulsion with the “ghost sign” (absence of the posterior horn of the medial meniscus).

CT Scan

- Bone stock
- Tunnels



Revision

Examination Under Anaesthesia



