

Multiligament tears: clinical examination, imaging

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Emergency

Chronic > 1-3 months

Emergency

- Clinical examination:
 - Skin
 - Neurovascular examination (peroneal nerve)
 - Extensor mechanism
- Laxity examination under anaesthesia
 - Frontal laxity +++
 - Sagittal laxity (anterior/posterior drawer)
 - Hughston test ++



Emergency

- X rays:

- AP
- Lateral

⇒ Fracture ??



- Dynamic X rays under anaesthesia:

- Valgus / varus
- Antero posterior

⇒ Laxity ??



- Injected CT:

⇒ Vascular lesion ??



Chronic

- Walking analysis (varus thrust?)
- Clinical examination:
 - Axis
 - Effusion, ROM
 - Sagittal laxity
 - Frontal laxity
 - Rotatory analysis



Typical imaging

- **X rays:**

- Antero posterior
- Lateral 30° of flexion
- Long leg



- **Dynamic X rays:**

- Frontal
- Sagittal

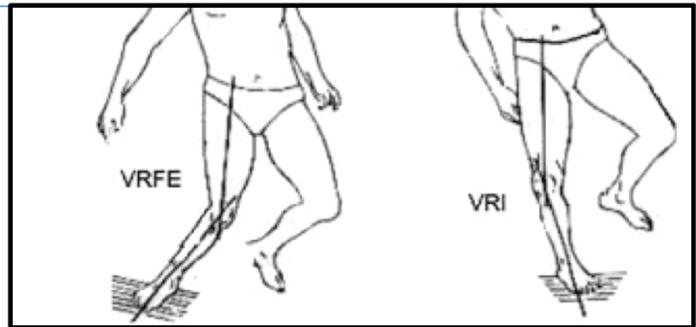
- **MRI:**

- Meniscus
- Cruciate ligaments
- Peripheral ligaments



ACL injury

- Clinical examination:
 - Lachmann test
 - Jerk test
 - Anterior drawer at 90°: peripheral posterior injury



ACL injury

- X rays:



Segond fracture



Tibial slope



Dynamic Xrays: Telos $\Delta >9\text{mm}$

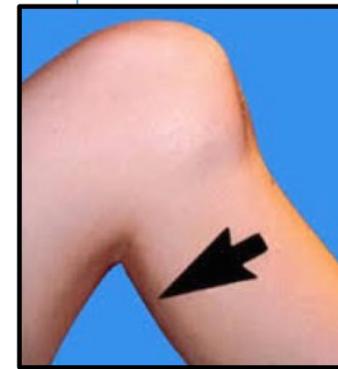
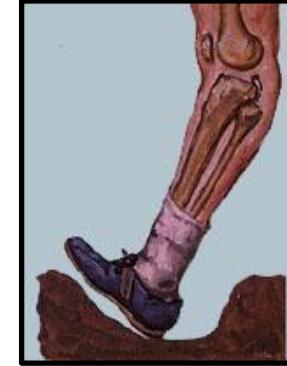
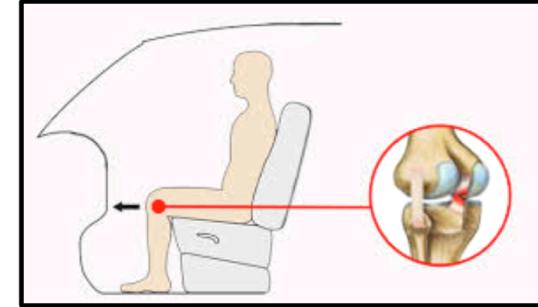
- MRI:

- Cartilage
- Meniscus tear +++



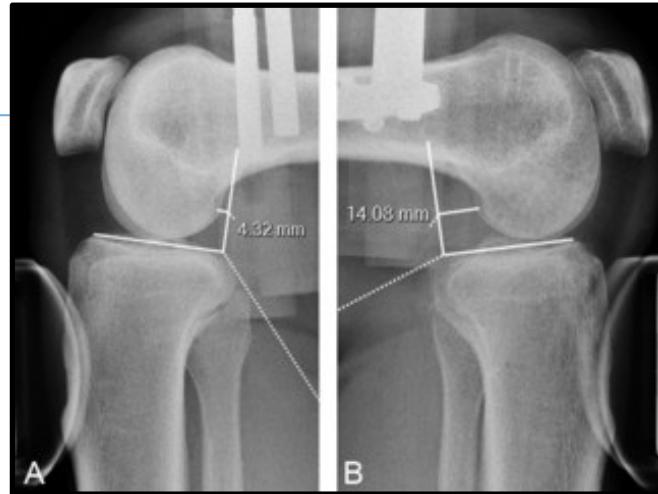
PCL injury

- Clinical examination:
 - Posterior sag
 - Posterior drawer at 90° flexion
 - Test with Internal Rotation
 - Always check associated lesion:
Hughston test (Postero Lateral Corner)
Frontal laxity (Lateral Collateral Ligament +++)



Isolated PCL injury

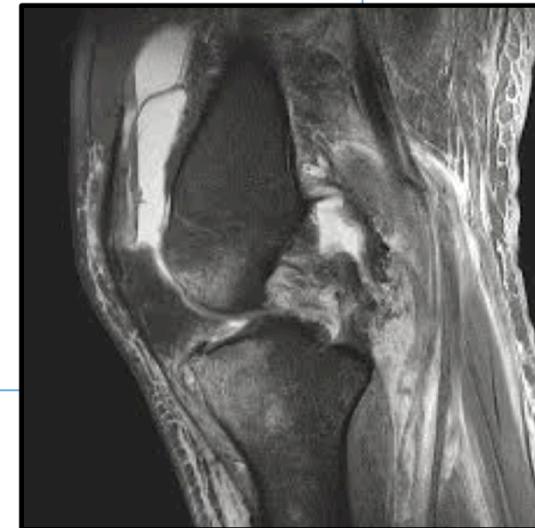
- Xrays:



Dynamic Xrays: **Bartlets** ($\Delta > 10\text{mm}$)

- MRI:

- PCL tear
- Associated lesions
 - ACL
 - Peripheral injuries



MCL injury

- Clinical examination:

Grade I	No laxity in extension and flexion
Grade II	Laxity at 30° of flexion
Grade III	Laxity in extension A. <5mm B. 5-10mm C. >10mm

- Imaging:

- Xrays:

- Valgus comparative stress X rays

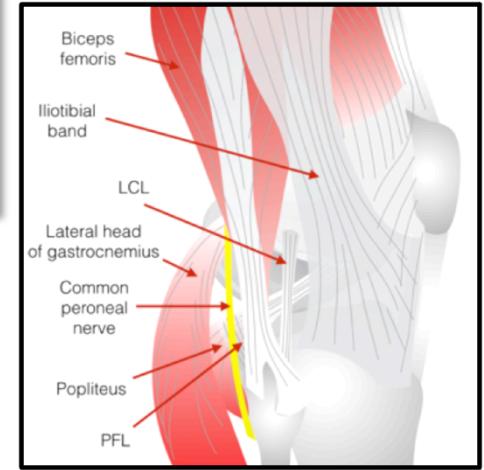
- MRI:

- Localization of the lesion: **femoral / midbody / tibial**



Postero lateral corner injury

- Clinical examination:
 - Varus laxity
 - Hyper Mobility of the lateral compartment at 30°
 - Hughston test
 - Neurologic examination (peroneal nerve)
 - Always think about ACL or/and PCL injury



Postero lateral corner injury

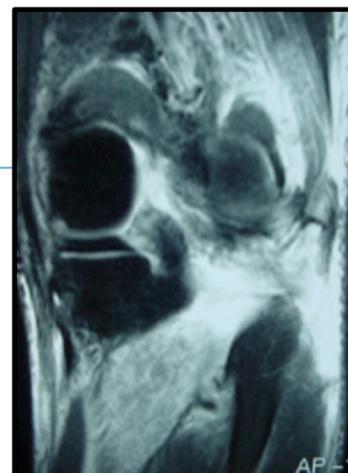
- Imaging:

- Xrays:

- Fibular head+++
 - Varus comparative stress X rays

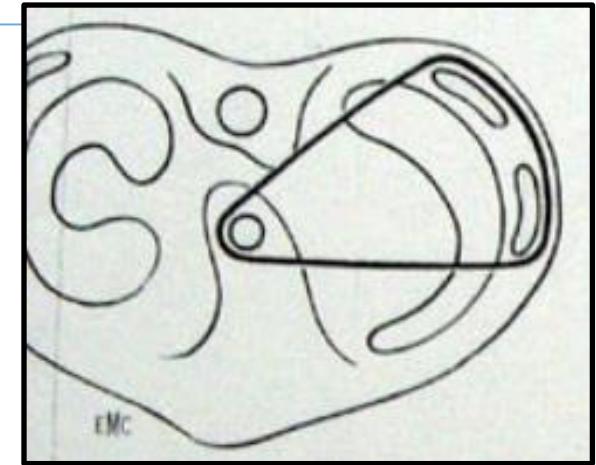
- MRI:

- LCL
 - Popliteus tendon
 - PFL



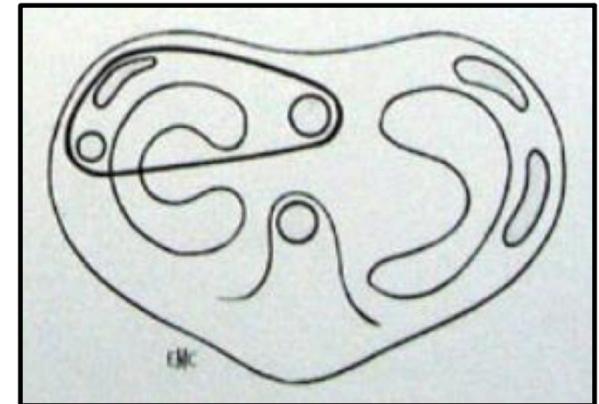
Unhappy triad

- Most frequent **antero medial triad +++ (95%)**
- **ACL + MCL + lateral meniscus**
 - Valgus + Flexion + External rotation
- Clinical examination:
 - Lachman +
 - Grading of MCL + frontal laxity



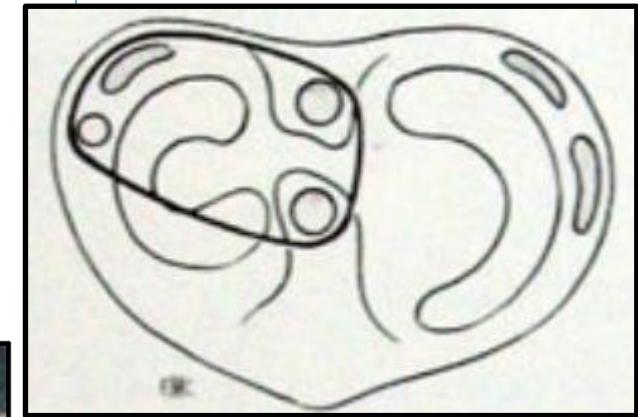
Postero lateral triad

- Rare
- **PCL + PLC + lateral meniscus**
 - Varus + Flexion + Recurvatum
- Clinical examination:
 - Positive posterior drawer
 - **Hughston test +++**
 - **Varus ++**
- Imaging:
 - Dynamic Xrays
 - MRI



Lateral pentad injury

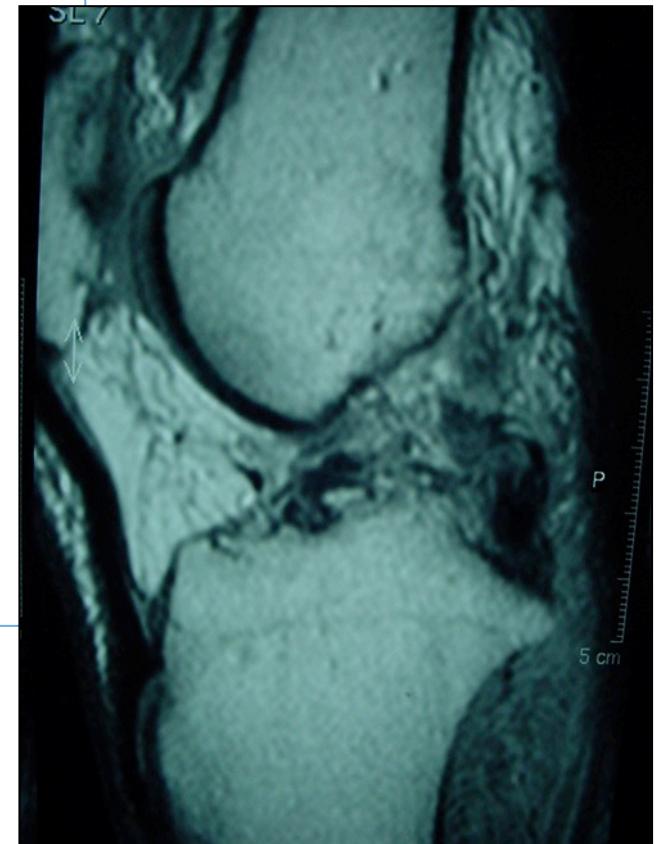
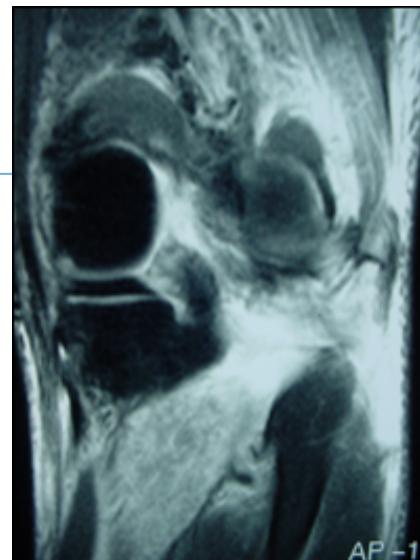
- Most frequent +++
- **ACL + PCL + LCL + PLC + lateral meniscus**
- Clinical examination:
 - Soft endpoint at the anterior drawer
 - Posterior drawer at 90°
 - Lateral frontal laxity
 - Hughston test



Lateral pentad injury

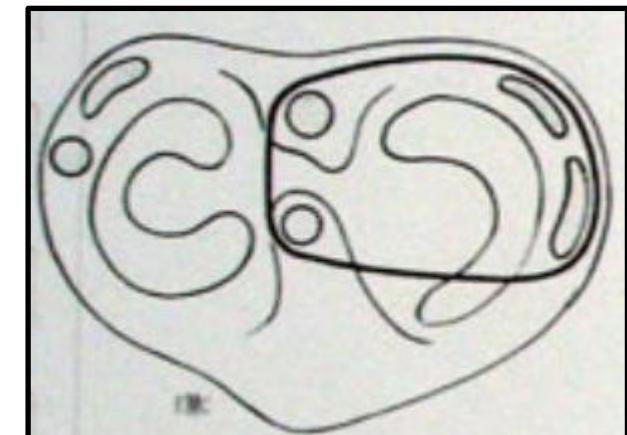
- Imaging:

- Xrays + **comparative varus stress Xrays**
- MRI
 - Meniscus
 - Identify ligament lesion



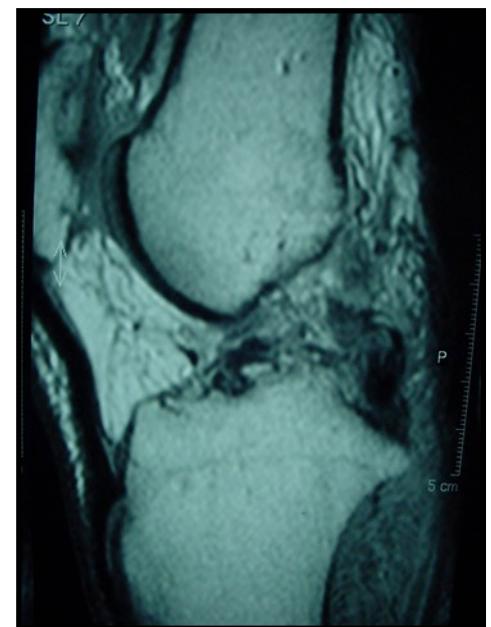
Medial pentad injury

- **ACL + PCL + PMC + MCL + medial meniscus**
- Clinical examination:
 - **Soft endpoint at the anterior drawer**
 - **Posterior drawer at 90°**
 - **Medial frontal laxity grade III**



Medial pentad injury

- Imaging:
 - Xrays + **valgus stress Xrays**
 - MRI
 - meniscus
 - Identify ligament lesions



Take home message

- **Bilateral and comparative examination**
- Emergency
 - Skin / Neurologic / Vascular
 - Xrays
 - Testing + Xrays under anaesthesia
- Chronic
 - Clinical examination
 - Dynamic Xrays +++
 - Combined injuries (triad / pentad)



