

Multi-ligament injuries one or several stages



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All in one or staged?

- This is not the point!
 - Case related decision
 - Systematic evaluation process
 - Make a plan



Every knee is different

- To define the complete picture of the lesion:
 - Open / close
 - PCL lesion: "peel-off", mid-substance, distal avulsion
 - Associated LCL/PLC and/or MCL/PMC
 - Association of an arterial injury
 - Association of a nerve injury



Every knee is different

- To define the complete picture of the lesion:
 - Bony lesions
 - Soft tissue
 - Fractures
 - Tendon injuries
 - Population - type of practice



The patient

- Age
- Gender (woman does better than man)

Jung et al *Arthroscopy* 2011

- **Functional demands** (athletes, physical activity
professional: functional guide)
- **Medical history** (cave: polytraumatized patient)



Literature

Orthop Surg (Hong Kong). 2011 Dec;19(3):297-302.

Staged arthroscopic reconstructive surgery for multiple ligament injuries of the knee.

M S, Pandey V, Rao SK, Rao S.

Department of Orthopaedics, Kasturba Medical College, Manipal University, Manipal, Karnataka, India.

n= 21, two/three stages surgery

1. Collateral ligament
2. PCL
3. If necessary ACL

There was no significant difference between early and delayed treatments and between low- and high-velocity injuries in terms of the Lysholm score, the IKDC grade, the range of movement, and the functional outcome.

By staging the procedures, the need for subsequent ACL reconstruction can be better evaluated, as ACL reconstruction is not necessary in patients not undertaking strenuous activities.



Literature

J Bone Joint Surg Am. 2009 Dec;91(12):2946-57.

Multiple-ligament knee injuries: a systematic review of the timing of operative intervention and postoperative rehabilitation.

Mook WR, Miller MD, Diduch DR, Hertel J, Boachie-Adjei Y, Hart JM.

Source

Department of Orthopaedic Surgery, University of Virginia Health System, Charlottesville, VA 22908, USA

24 retrospective studies

396 multiple-ligament injured knees

This review of the available literature suggests that delayed reconstructions of severe multiple-ligament knee injuries could potentially yield equivalent outcomes in terms of stability when compared with acute surgery. However, in the acutely managed patient, **early mobility is associated with better outcomes in comparison with immobilization. Acute surgery is highly associated with range-of-motion deficits. Staged procedures may produce better subjective outcomes and a lower number of range-of-motion deficits but are still likely to require additional treatment for joint stiffness.** More aggressive rehabilitation may prevent this from occurring in multiple-ligament knee injuries that are treated acutely.



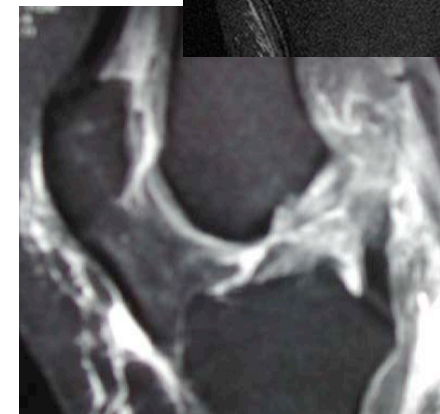
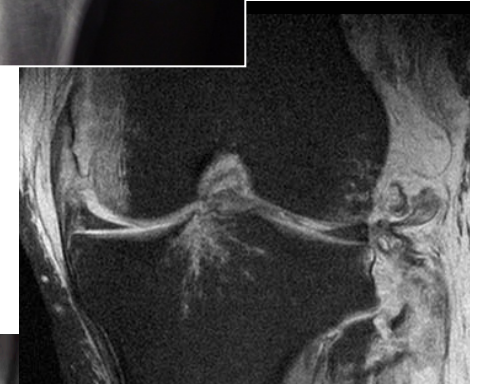
One stage

- Advantages: Allow for complete ligaments reconstruction with one stage surgery
- Disadvantages:
 - Technically demanding (long, complex procedure)
 - Grafts availability could be a problem
 - Greater risk of arthrofibrosis

Case 1:

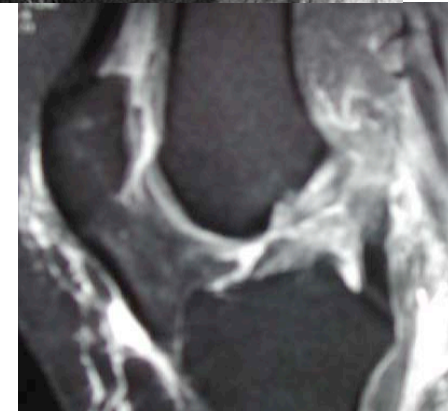
- Male, 25 years-old
- Motorcycle accident
- World Football player (amateur)
- Height: 1,80m; Weight: 75 kg

- Clinical status: (J+1)
 - Lachman +++; Posterior Drawer test ++
 - Hughston test: +
 - Varus extension ++, Varus flexion +++
 - Valgus extension +, Valgus flexion++
 - Neuro-vascular status: normal
- Standard X rays: fibular head avulsion



Case 1: discussion

- Conservative treatment or surgical treatment?
- If surgical option is chosen:
 - What is the optimal timing of surgery ?
 - Whose lesions would you initially treat?
 - Which graft would you choose?
 - Open surgery or arthroscopic surgery?
 - Post-operative protocol? (weight bearing?)
- If these lesions were associated with
 - A femoral fracture?
 - A tibial plateau fracture?





Two stages surgery

- Objectives are:
 - To fix the PLC and if possible restore the neutral position of the knee
 - To treat the remaining laxity in the second stage
- Advantages:
 - Surgery can be simpler during the first stage (peripheral ligament repair)
 - The more technically demanding surgery can be planned for the second stage
- Disadvantages:
 - Much longer treatment requested
 - Possible complications during the first stage (i.e. infection) may delay the or contra-indicate the second stage



Case discussion

- Ms S. 22 y. old secretary
- MVA 2 weeks before
- Left open femur fracture
- Right knee dislocation (close)
- Made: Left IM femoral nailing
External fixator on the right leg



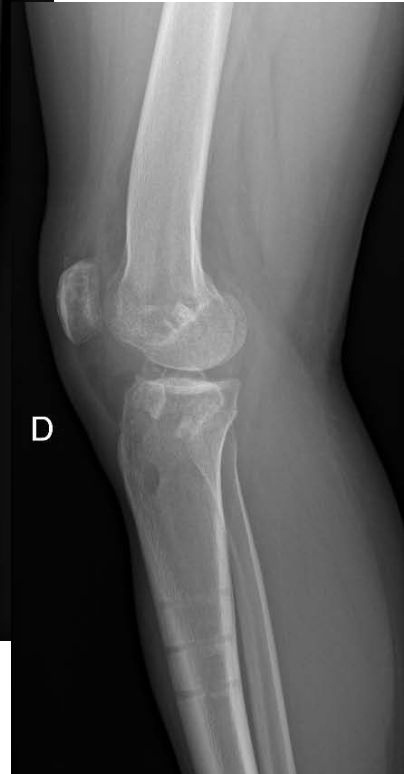
Ms S. 22y old

- Swollen knee with Ex-Fix
- Skin excoriation on the anterior aspect of the knee (5x6cm)
- Peroneal neurapraxia
- Fibular head fracture, LCL-PLC grade III
- PCL "mid-substance" grade III, ACL grade III, LM posterior root tear

- 
- Ms S. 22 y. old, secretary
-

- What's your plan ?

Case discussion

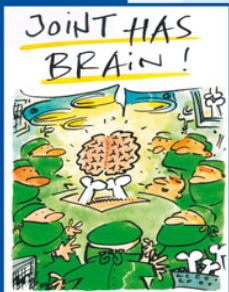




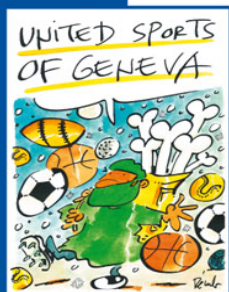
What did we learn this morning?

- 1) Every knee must be considered individually and requires a specific strategy
- 2) Correct treatment is determined after:
 - ✓ Clinical examination with stress radiographs and MRI
 - ✓ Vascular complications must be ruled out and corrected before ligament surgery
 - ✓ Associated fractures should be included in the strategy
 - ✓ Other complications: polytrauma, compartment syndrome should be considered
 - ✓ Patient status (age, weight, activities, sports)

Standardized protocol can not be recommended for such cases



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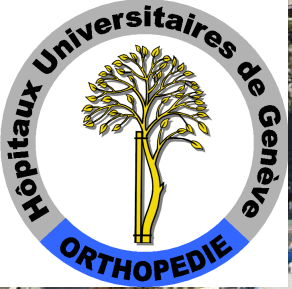


**Early registration
deadline:
February 10, 2012**


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Thank you for listening



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To summarize

- All in one:
 - Better stability
 - Risk of joint stiffness (arthrofibrosis)
 - But, early motion is possible
 - Slower rehabilitation
 - Better outcomes?



One stage

- Therapeutic windows: D5-D20
- Close
- PCL lesion: "peel-off" or distal avulsion, bony avulsion
- LCL/PLC vs MCL/PMC
- Nerve injuries
- Soft tissue



Two stages

- When open injury
- Arterial lesion
- Associated fractures
- Contaminated skin lesion
- Lateral compartment repairable
- Staged ACL recon



Two stages

- HTO
- Aborted surgery:
 - Fluid extravasation
 - Technical problem
 - Swelling of the knee



Two stages

- HTO
- Aborted surgery:
 - Fluid extravasation
 - Technical problem
 - Swelling of the knee



Case discussion

- Mr B, 56 y old, winemaker
- Ski accident
- Severe concussion
- Severe facial injury (Lefort 3)
- Left knee dislocation (immobilized in extension)
- Two weeks in ICU



Case discussion

- Mr B, 56 y old winemaker
 - PCL grade III, PLC grade III, ACL grade II-III
 - Fibular head fracture
 - No injury of the medial compartment
- ✓ Osteosuture of the fibular head fracture by trauma surgeon in emergency

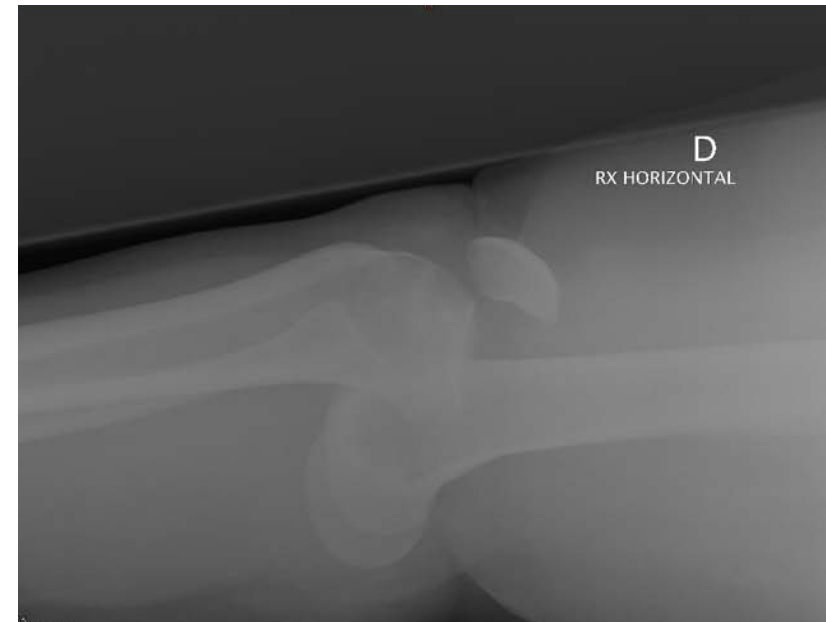
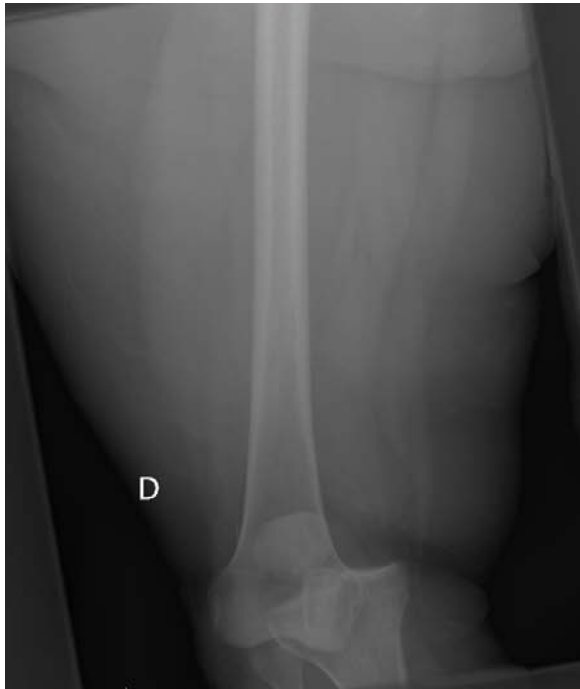
Case

- Mr B, 56 y

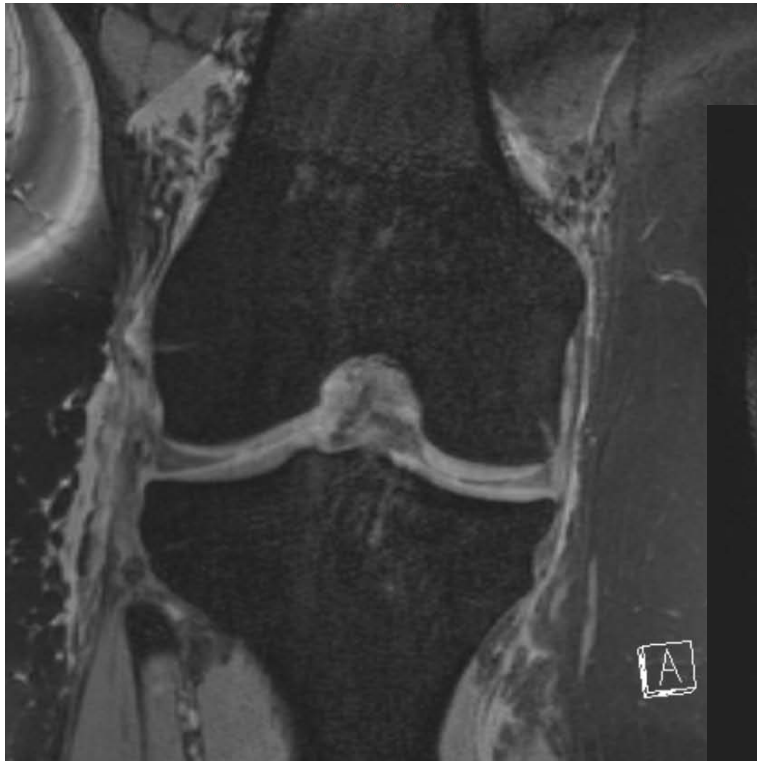


Case discussion

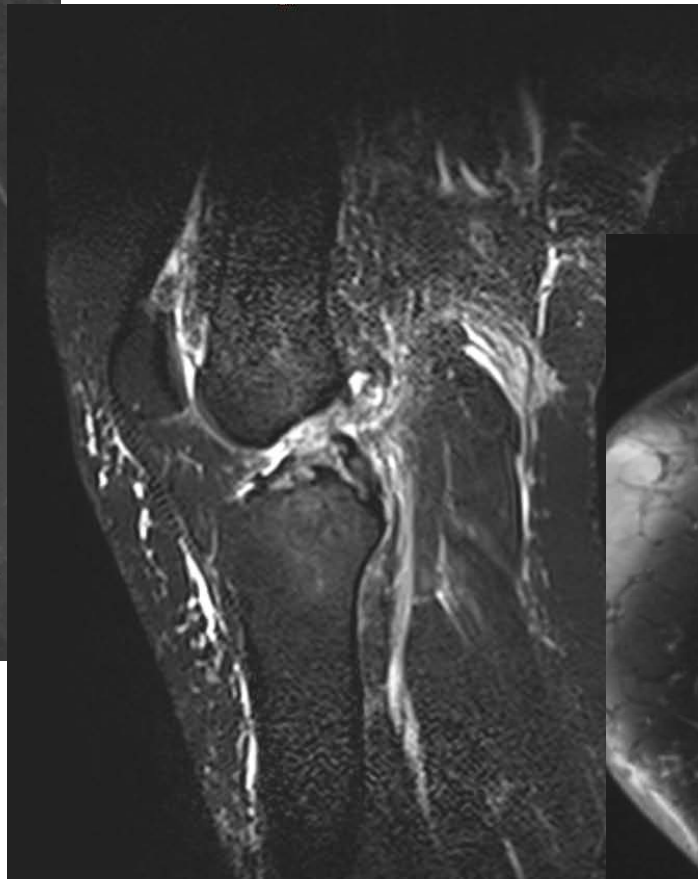
- Ms W, 33y old, obese business woman
- Slide in her kitchen



Ms W, 33 y old

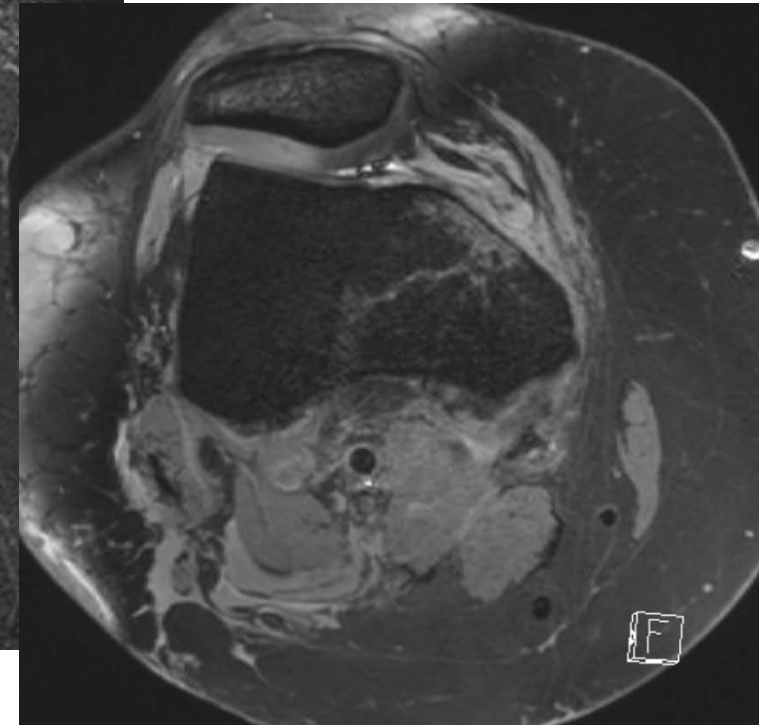


LCL-PLC grade III



PCL « peel-off »

MCL-POL prox/ med retin





Ms W, 33y old

- PCL "peel-off" injury Re-inserted
- LCL/PLC Recon hamstring
- MCL, POL prox, med retin Repaired
- ACL Nothing