Management of Posterolateral Corner Injuries : Repair vs Reconstruction

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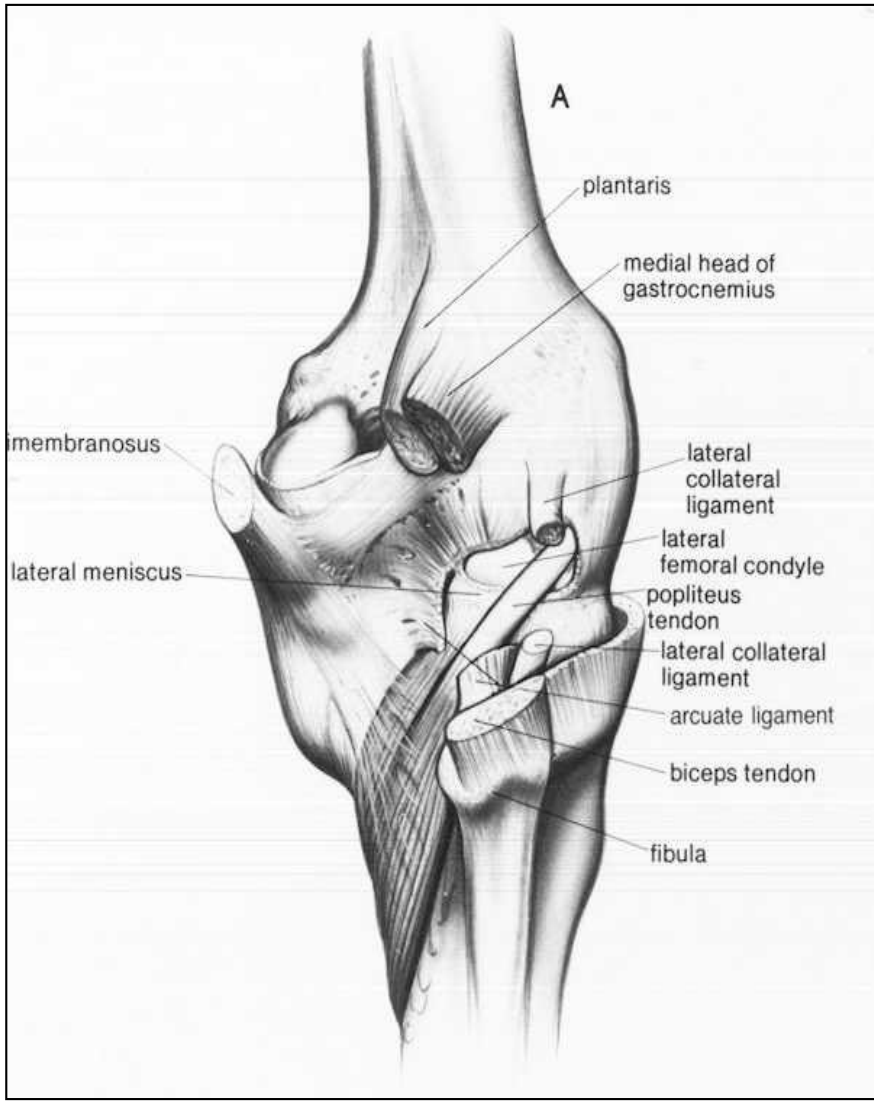
Posterolateral Corner

- Anatomy
  - Iliotibial band
  - Biceps complex
  - **Popliteus**
  - **Lateral collateral ligament**
  - **Popliteofibular ligament**



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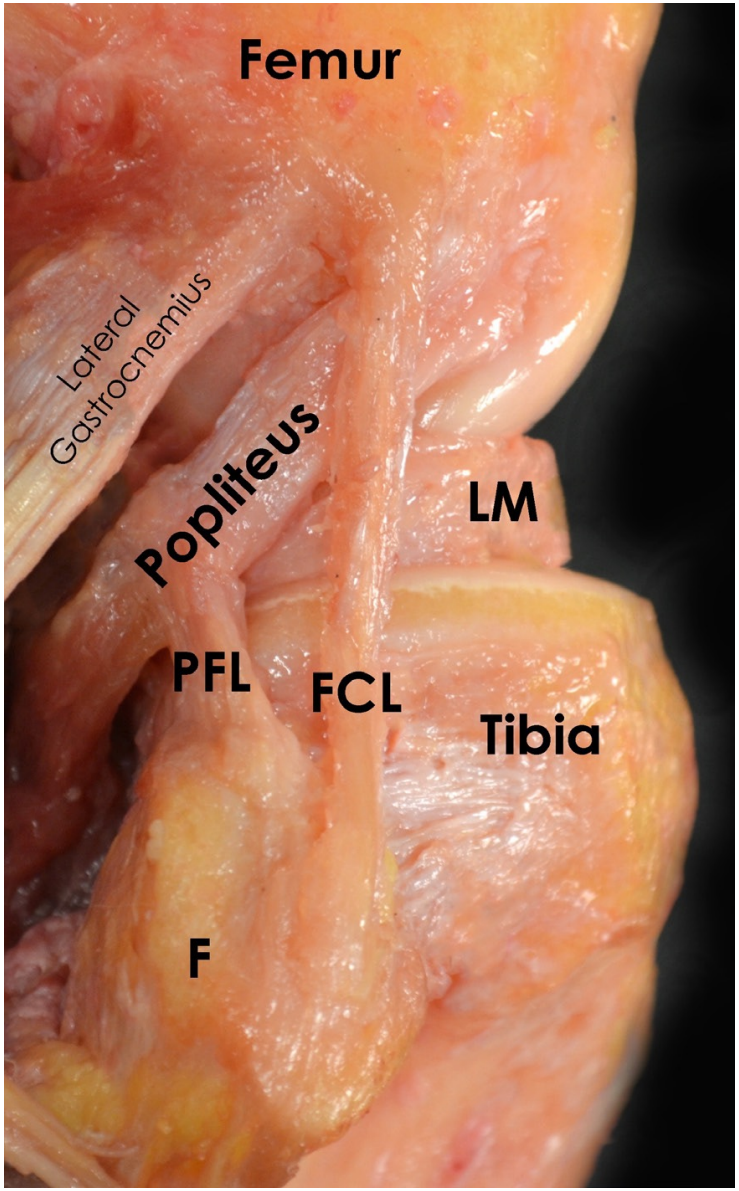
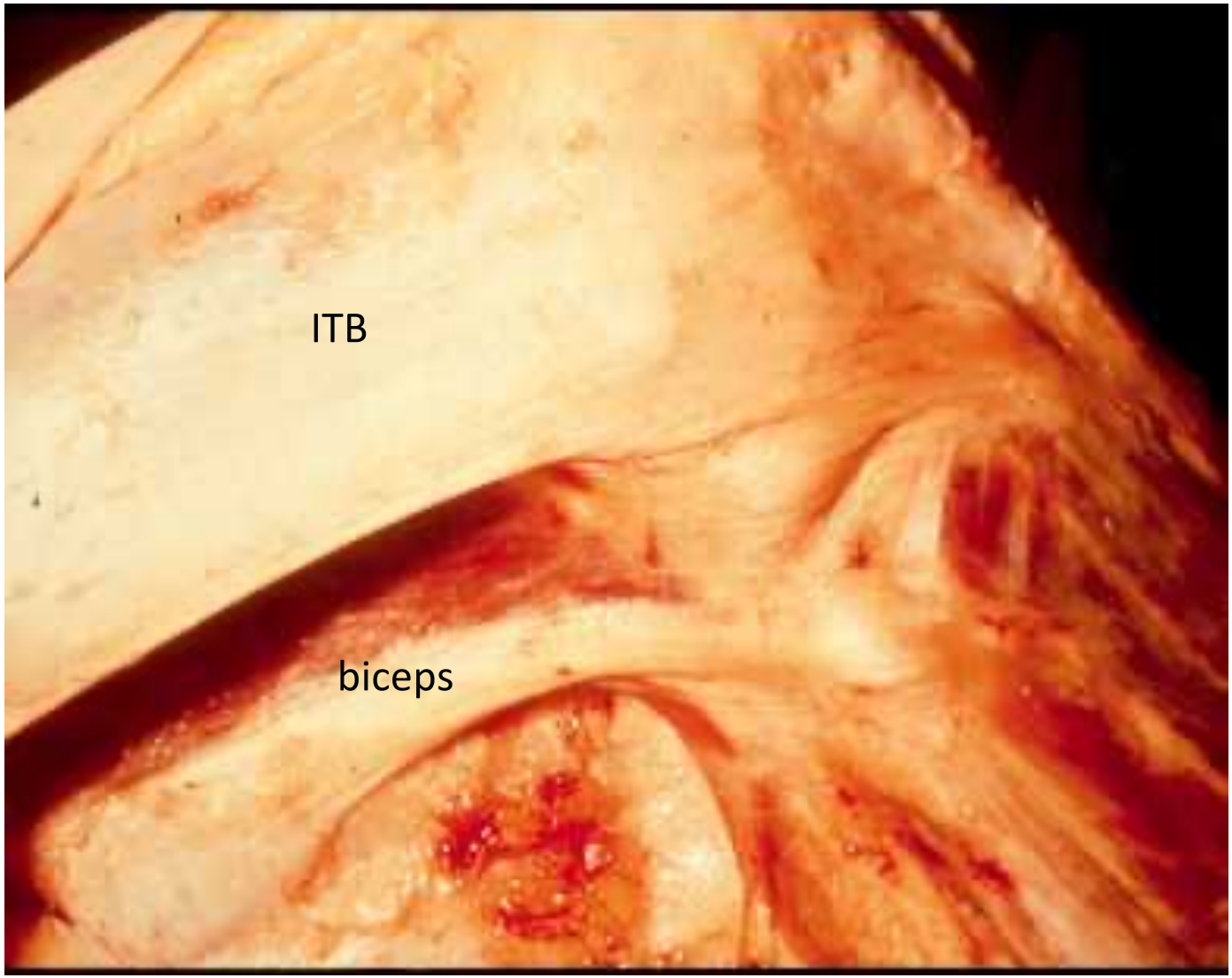


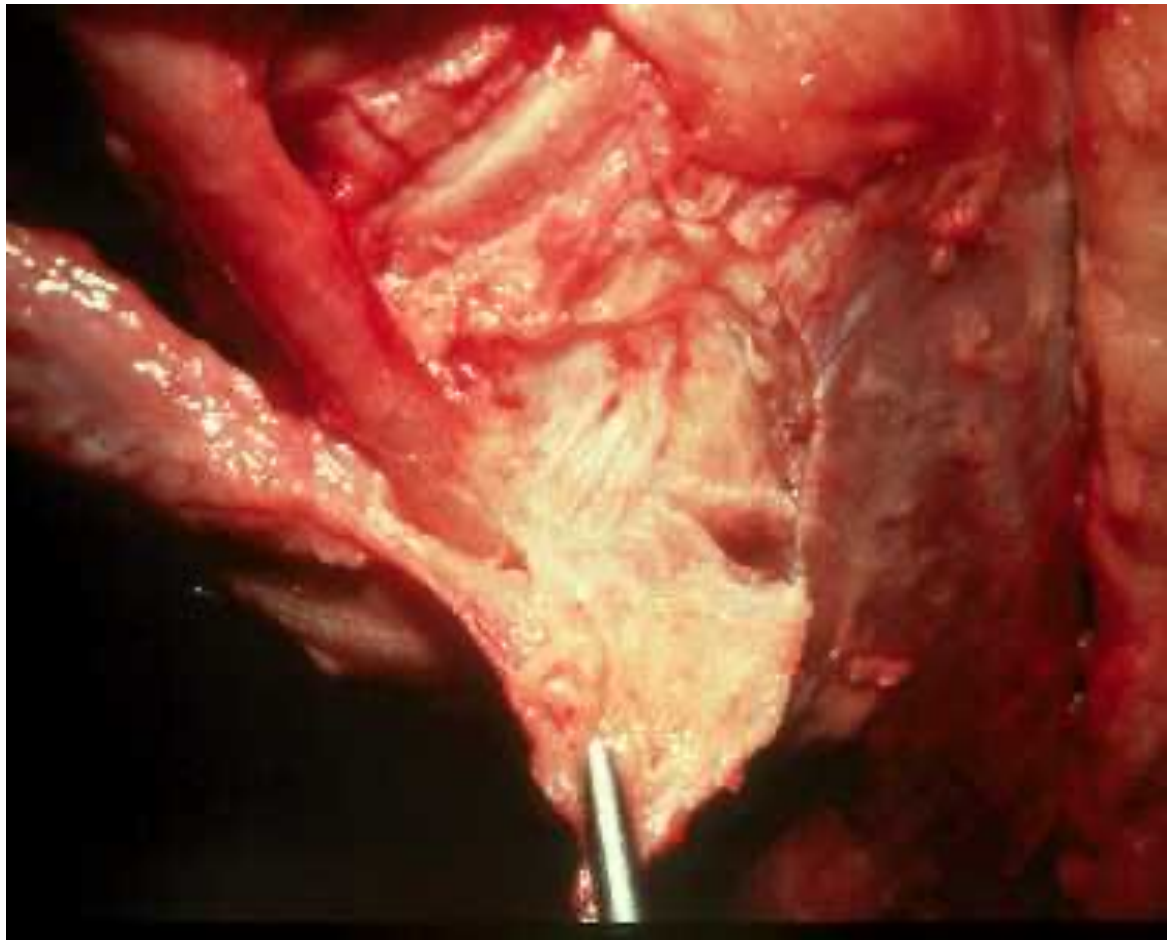
Posterolateral Anatomy

Superficial layer



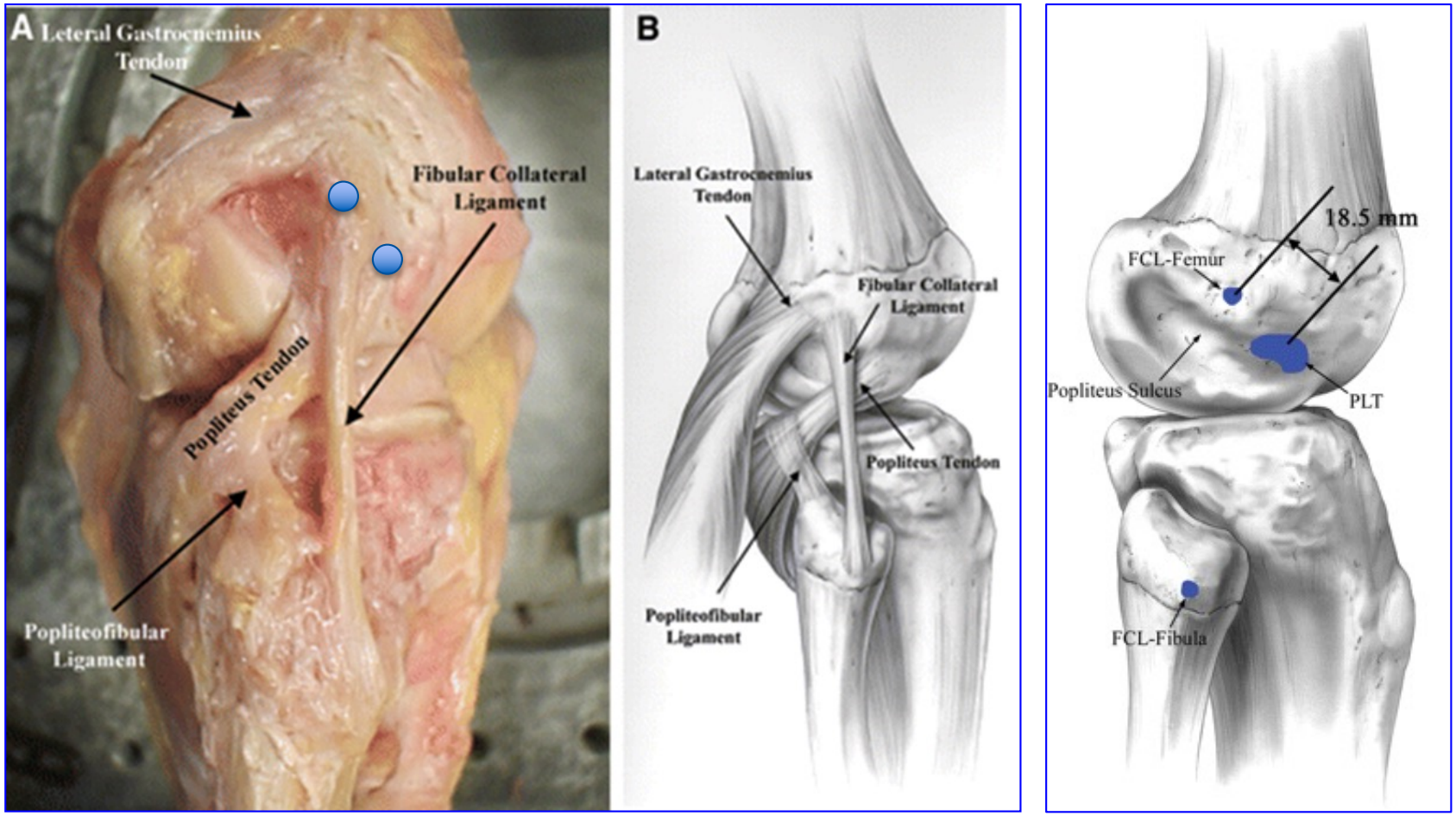
Posterolateral Anatomy

- Biceps superficial and deep to LCL



PLC Anatomy

- Complex
- 3 main structures: FCL, PFL, popliteus



LaPrade, AJSM 2003

PLC / Combined Instability

Treatment Considerations

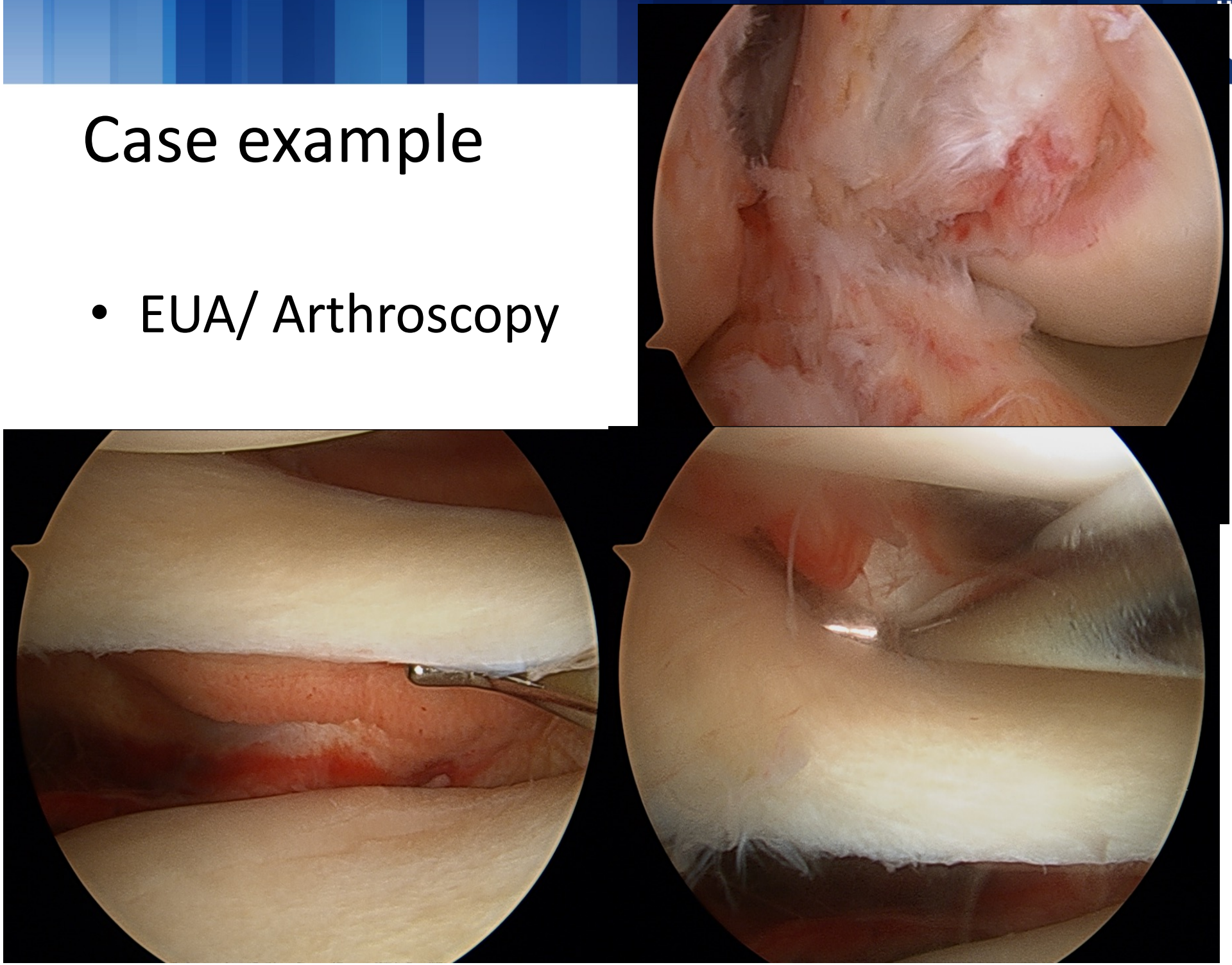
- ACL/ PCL injury
- acute vs chronic
  - Repair vs reconstruction
- bony avulsion vs mid substance tears
  - Acute vs delayed
  - Repair vs reconstruction
- axial alignment

Case example

- 25 yo soccer player
- Contact injury : varus mechanism
  - ACL complete
  - LCL injury /PLC injury
- Plan for ACLR , possible PLC repair/augmentation

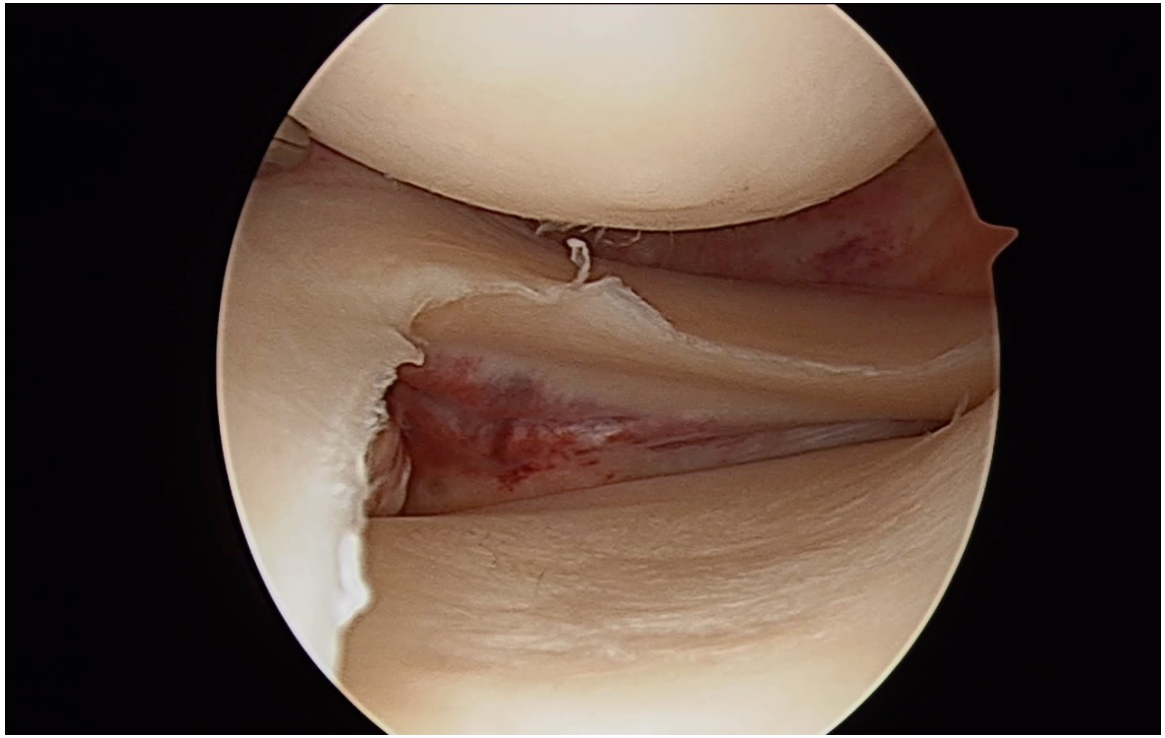
Case example

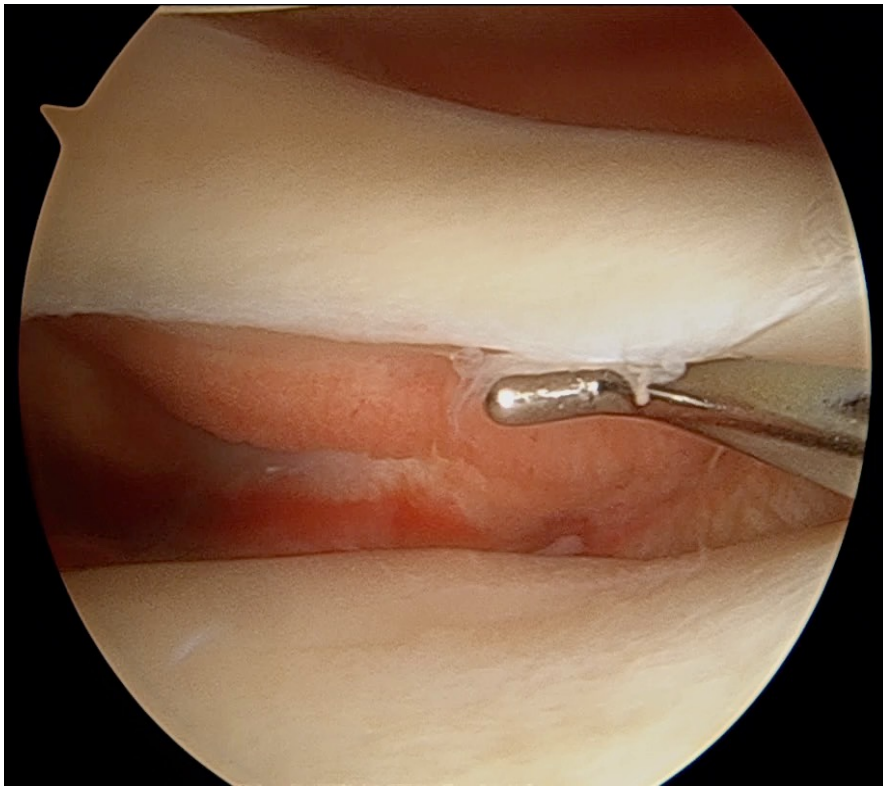
- EUA/ Arthroscopy



Case example

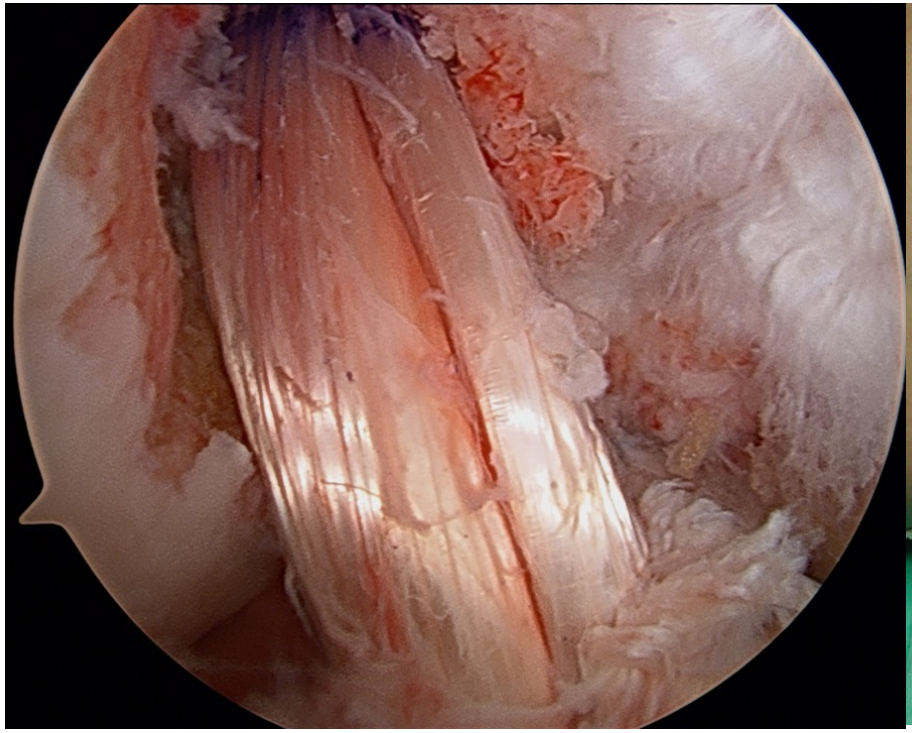
- EUA/ Arthroscopy

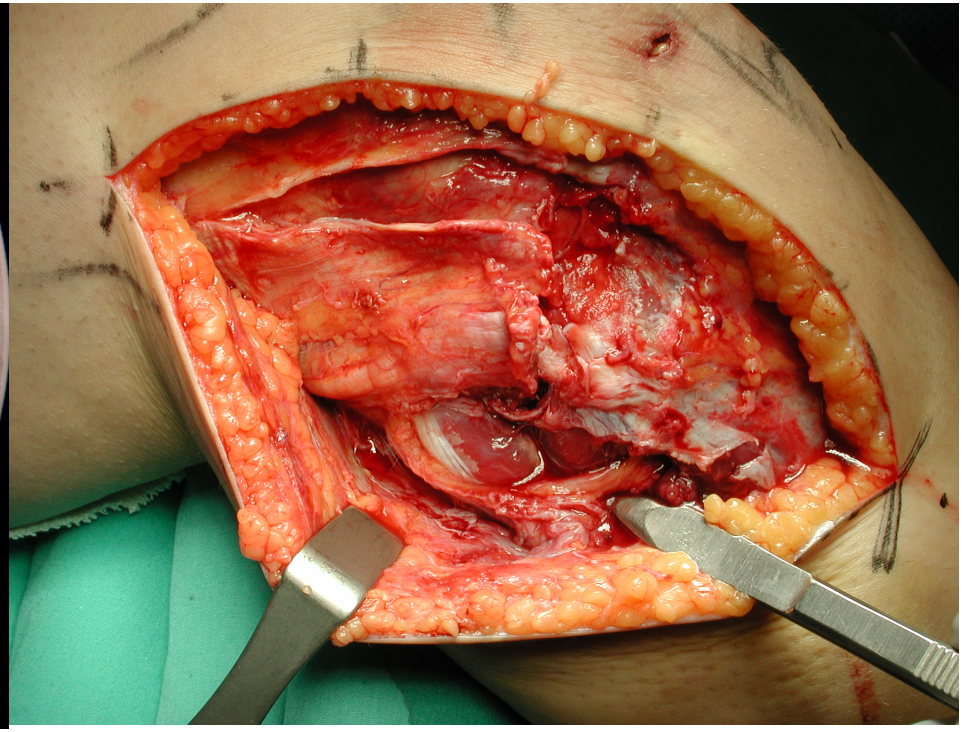


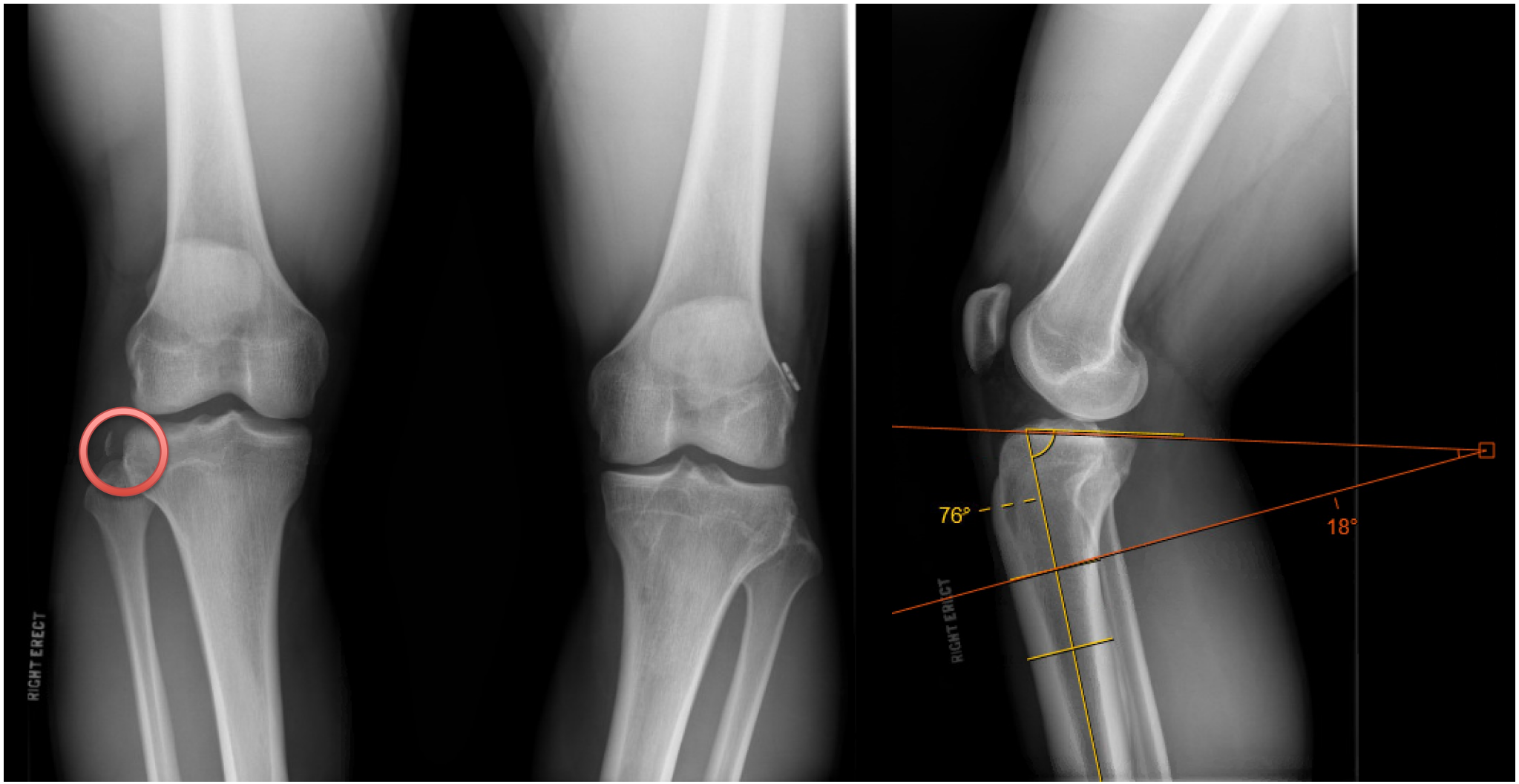


Case example

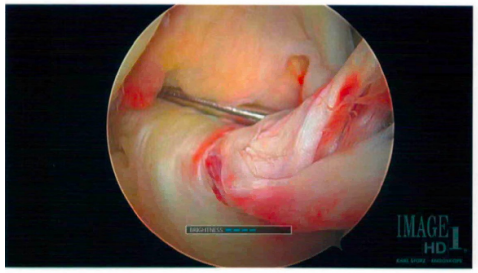
- ACLR , open lateral anatomic repair



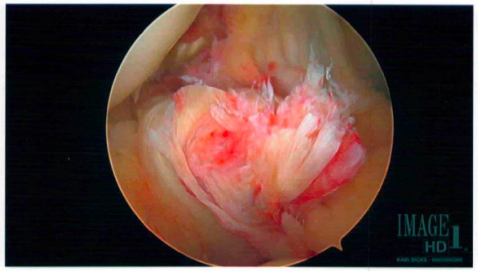



RIGHT ERECT
76°
18°
RIGHT ERECT

Intra-operative



IMG009



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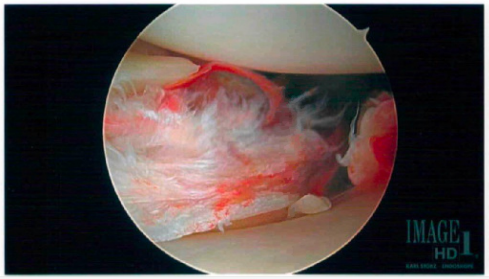

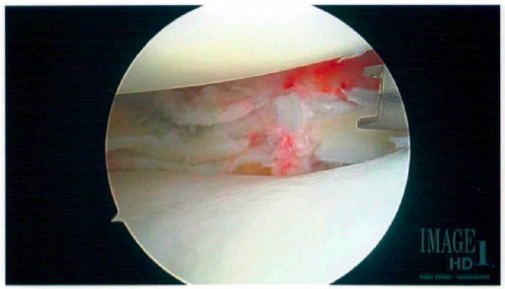

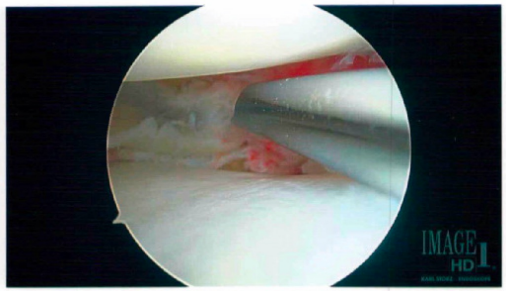

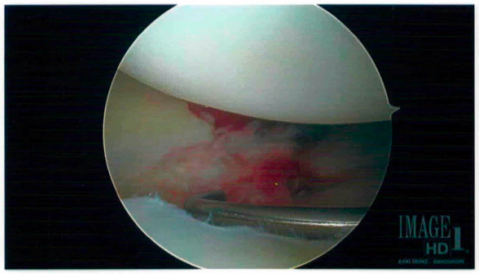

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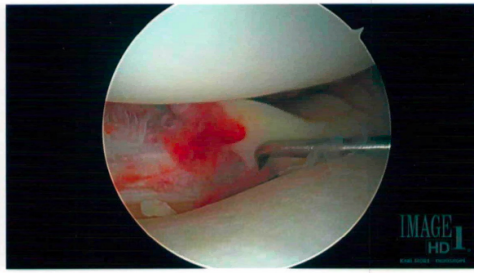

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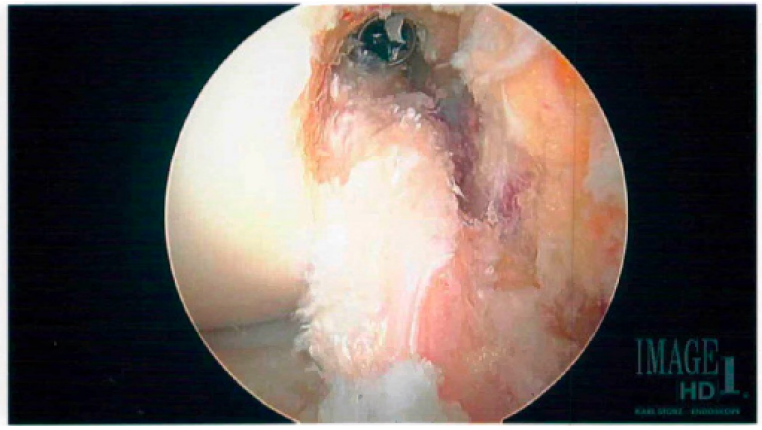
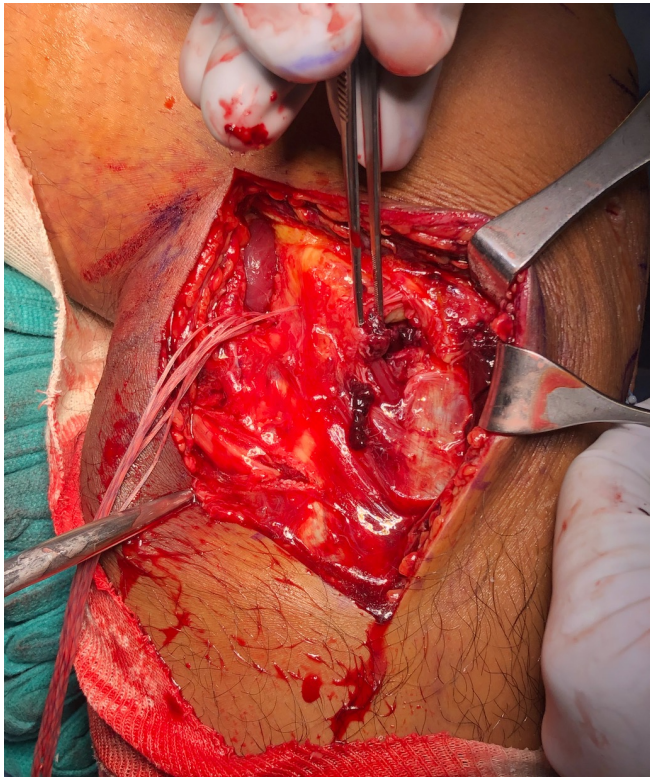


Intra-operative



Literature Review

Original article

KSSTA 2014

Management of combined anterior or posterior cruciate ligament and posterolateral corner injuries: A systematic review

G. Rochecongar[a], S. Plaweski[b], M. Azar[a], G. Demey[c], J. Arndt[d], M.-L. Louis[e], R. Limozin[f], P. Djian[g], B. Sonnery-Cottet[h], V. Bousquet[i], X. Bajard[j], A. Wajsfisz[k], P. Boisrenoult[l,*], the French Society for Arthroscopy (Société française d'arthroscopie, SFA)[m]

Management of Combined Anterior Cruciate Ligament–Posterolateral Corner Tears

AJSM 2014

A Systematic Review

Tommaso Bonanzinga,*† MD, Stefano Zaffagnini,†‡ MD, Alberto Grassi,† MD, Giulio Maria Marcheggiani Muccioli,† MD, Maria Pia Neri,† MD, and Maurilio Marcacci,†‡ MD
Investigation performed at Istituto Ortopedico Rizzoli, Bologna, Italy

ACL/ PLC better than PCL/PLC injuries

Acute Posterolateral Instability

Diagnosis

- Spectrum of injury : isolated+/- cruciate injury to knee dislocation +/- peroneal N injury +/- vascular injury
- Exam difficult in acute situation, MRI very useful
- Lateral/PL pain
- Anteromedial / proximal tibial contusion

Posterolateral Instability

Knee Surgery, Sports Traumatology, Arthroscopy (2019) 27:2520–2529
https://doi.org/10.1007/s00167-018-5260-4

KNEE

Posterolateral corner of the knee: an expert consensus statement on diagnosis, classification, treatment, and rehabilitation

Jorge Chahla[1] · Iain R. Murray[2] · James Robinson[8,9] · Koen Lagae[10] · Fabrizio Margheritini[11] · Brett Fritsch[12] · Manuel Leyes[13] · Björn Barenius[14] · Nicolas Pujol[15,16] · Lars Engebretsen[17] · Martin Lind[18] · Moises Cohen[19] · Rodrigo Maestu[20] · Alan Getgood[21] · Gonzalo Ferrer[28] · Silvio Villascusa[26] · Soshi Uchida[31] · Bruce A. Levy[23] · Richard Von Bormann[24] · Charles Brown[25] · Jacques Menetrey[29] · Michael Hantes[30] · Timothy Lording[32] · Kristian Samuelsson[5,33] · Karl Heinz Frosch[6,7] · Juan Carlos Monllau[27] · David Parker[12] · Robert F. LaPrade[22] · Pablo E. Gelber[3,4]

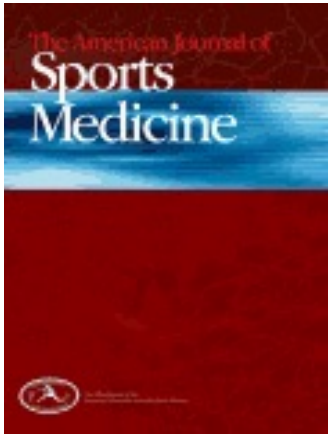
Received: 20 August 2018 / Accepted: 23 October 2018 / Published online: 26 November 2018

Twenty-seven experts (100% response rate) completed three rounds of surveys. Consensus was reached in 92% of the statements relating to diagnosis of PLC injuries, 100% relating to classification, **70% relating to treatment** and in 88% of items relating to rehabilitation statements, **with an overall consensus of 81%.**

PLC Injuries : Management

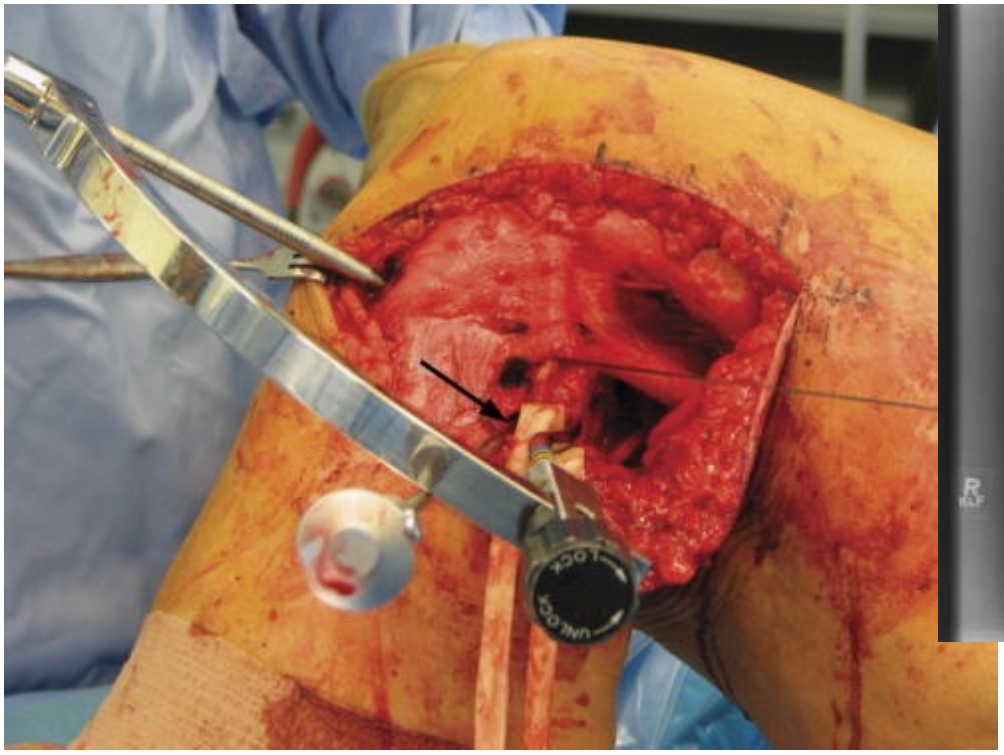
- Prospective study: 56 patients, 57 PLC injuries
  - 13/35 failed repairs (37%)
  - 2/22 failed reconstructions (9%)
- Despite diligent assessment of soft tissues, authors cite soft tissue as still not of high enough quality for successful repair on consistent basis

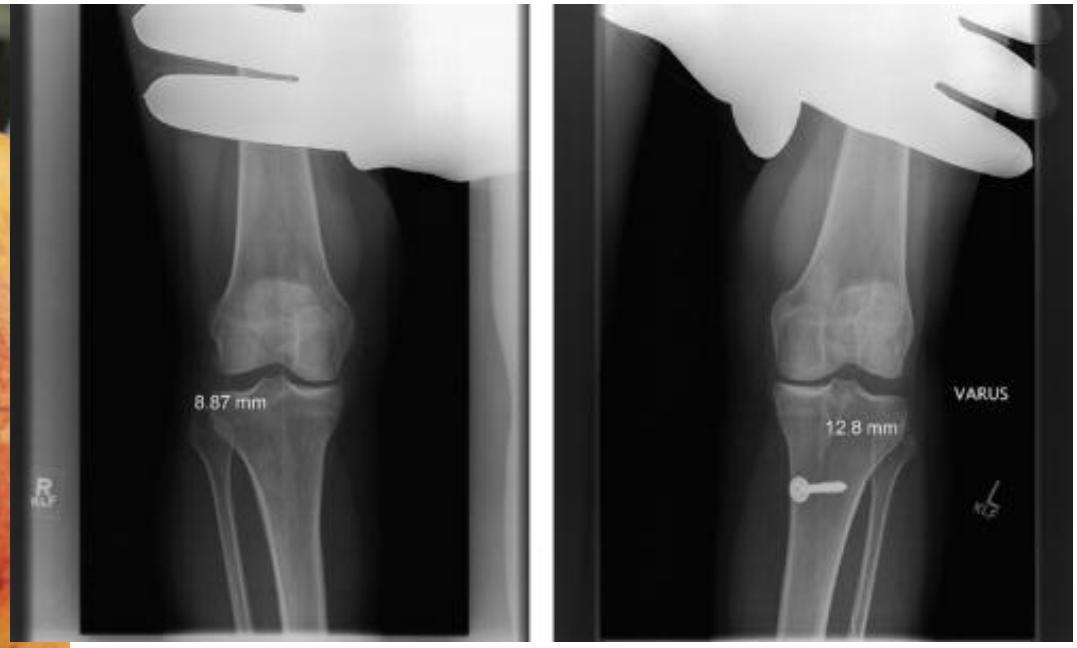
Stannard, J.P., et al., *The posterolateral corner of the knee: repair versus reconstruction.* Am J Sports Med, 2005



Study purpose

- 1. Compare results of PLC repair vs reconstruction
- 2. Assess varus gapping on post-operative radiographs.





LaPrade, Sports Med Arthrosc, 2006

PLC repair vs reconstruction

- 61 knees, 60 patients
  - 43 reconstructions, 18 repairs
- 17 reconstructions, 9 repairs RTC
  - IKDC, Lysholm
  - Varus stress XR at 0 and 20 degrees
    - 20 control patients with stress XR
- Chart review of all patients
  - MOI, Timing of surgery, complications, etc

PLC Injuries: repair vs Reconstruction

Knee Surg Sports Traumatol Arthrosc (2015) 23:2983–2991
DOI 10.1007/s00167-014-3451-1

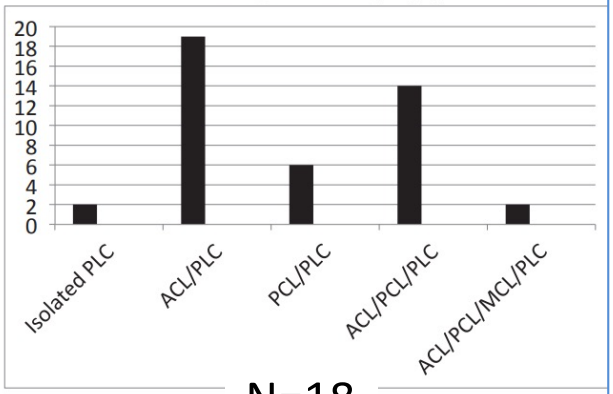
KNEE

Surgical treatment of multiligament knee injuries

Shane Cook · T. J. Ridley · Mark A. McCarthy · Yubo Gao · Brian R. Wolf · Annunziato Amendola · Matthew J. Bollier

N=43

Table 3: PLC Reconstruction cohort concomitant ligament injury patterns

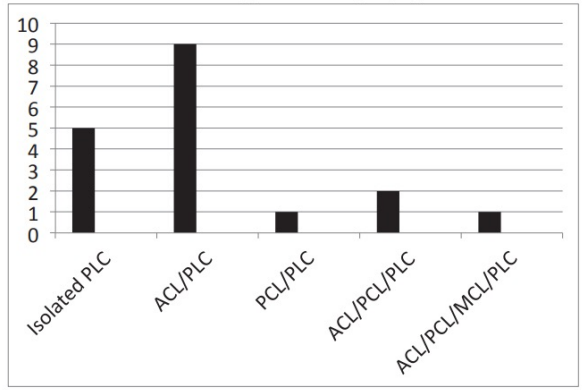


POSTEROLATERAL KNEE RECONSTRUCTION VERSUS REPAIR

Mark McCarthy, MD, TJ Ridley, MD, Matthew Bollier, MD,
Shane Cook, MD, Brian Wolf, MD, Annunziato Amendola, MD

N=18

Table 4: PLC Repair cohort concomitant ligament injury patterns



PLC Injuries: repair vs Reconstruction

Table 5: PLC structure injury patterns in repair cohort

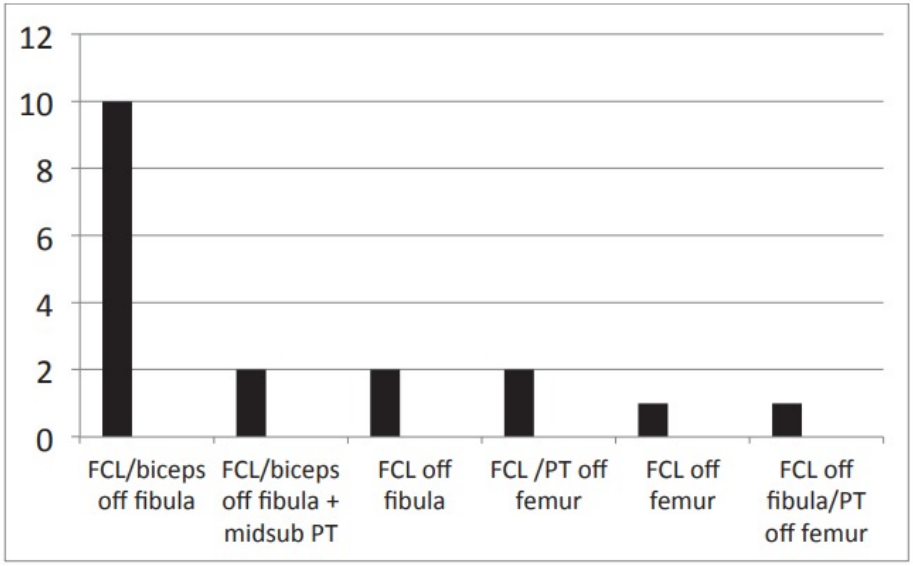


Table 6: IKDC, Lysholm averages and return to preoperative activity

	IKDC	Lysholm	Return to Activity (%)
Repair	71	83	13/13 (100)
Recon	68	83	25/28 (89.3)

- **Acute repair** with avulsions
- **Reconstruction** with auto or allograft with mid-substance or chronic injuries
- Repair or reconstruct all main structures

IKDC and Lysholm

- IKDC
  - Reconstruction: 68
  - Repair: 71
  - p = 0.72
- Lysholm
  - Reconstruction: 83
  - Repair: 83
  - p = 0.97

Neurovascular Injuries

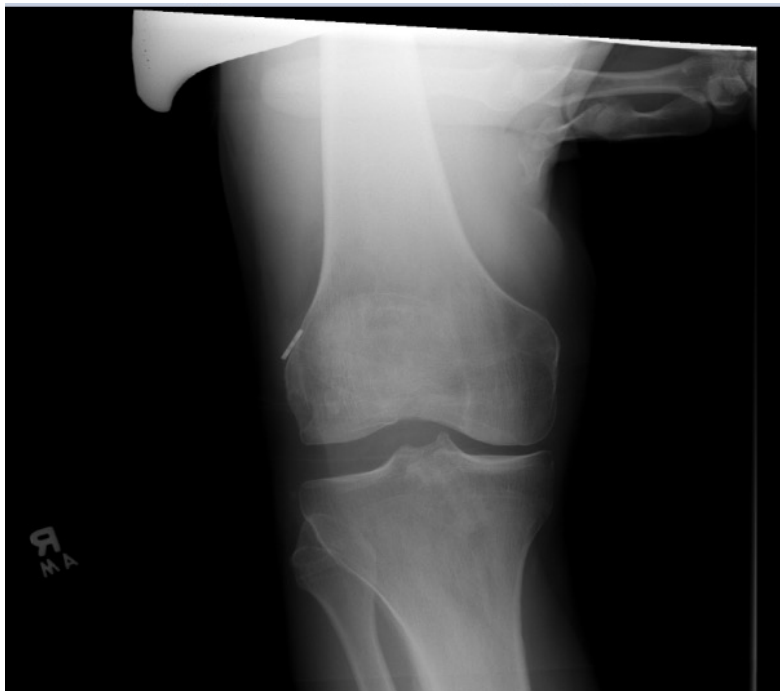
- Peroneal nerve injuries:
  - Reconstruction: 10/43 (23.4%)
  - Repair: 4/18 (22.2%)
- Popliteal artery injuries:
  - Reconstruction: 2/43 (4.7%)
  - Repair: 0/18 (0%)

Varus Stress Radiographs

- Average Varus Gapping (mm):

	Control	Reconstruction	Repair
0 degrees	5.3	8.2	8.8
20 degrees	6.5	11.3	10.3

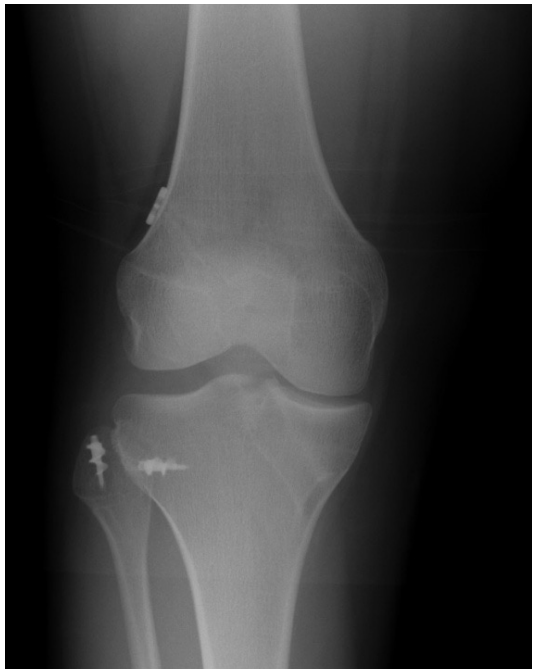
  - P value: recon vs repair:
    - 0 degrees: 0.52
    - 20 degrees: 0.42



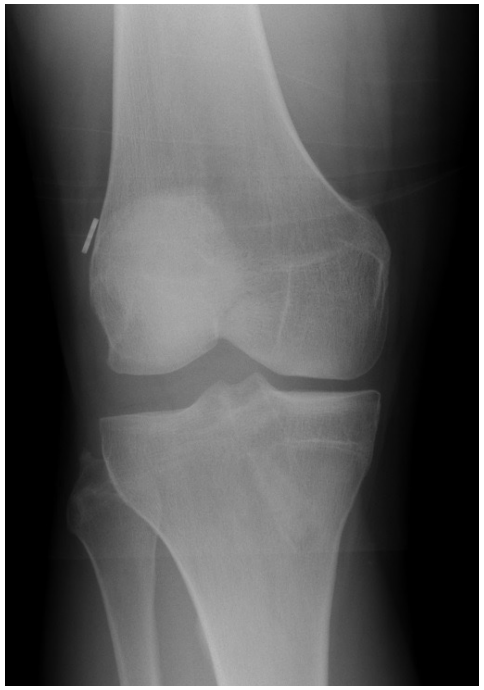
Varus Stress Radiographs

	Control	Reconstruction	Repair
0 degrees	5.3	8.2	8.8
20 degrees	6.5	11.3	10.3

- P value:
  - Control vs recon and repair: < 0.001 at 0 and 20 degrees



Repair example: 20 degrees: 8.1 mm gapping



Recon example: 20 degrees: 12.9 mm gapping

Discussion

- Decreased failure rate of repairs
- Varus gapping significant radiographically; clinically, no patient with instability
- Repair is an option with acute avulsive injuries

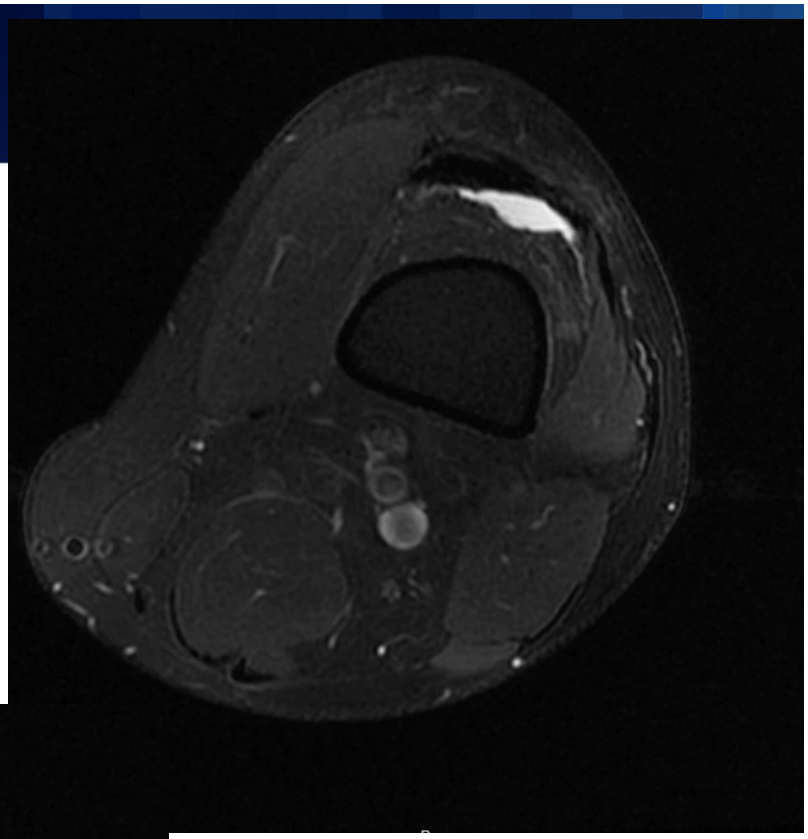
Case : 40 yo male military

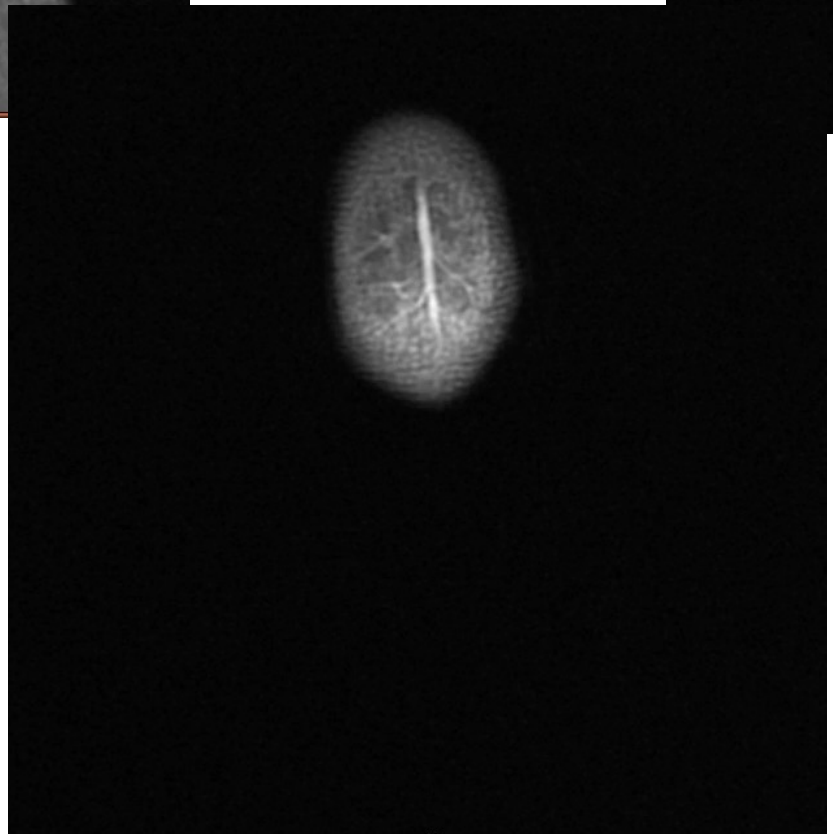
- Isolated PCLR with combined PLC injury

- Examination

Radiographs (Post-Op)

MRI

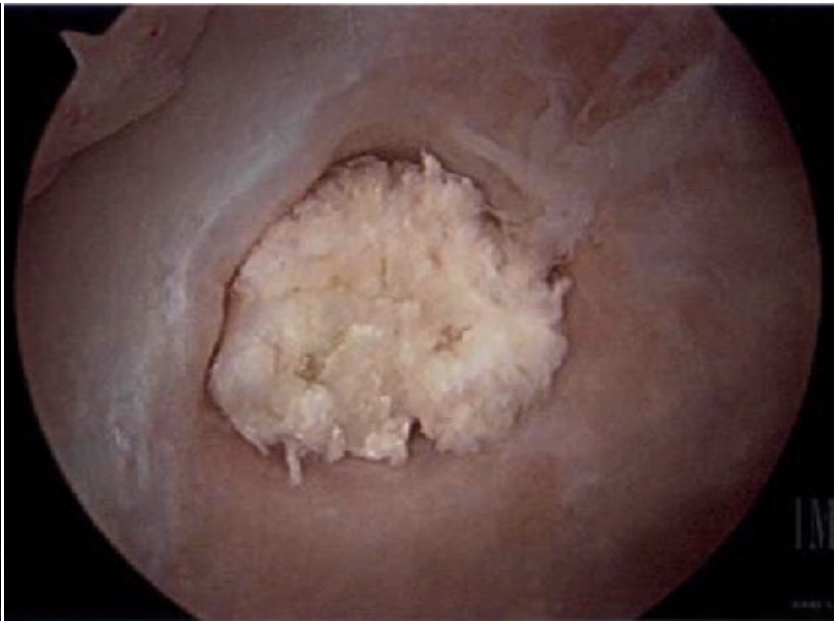


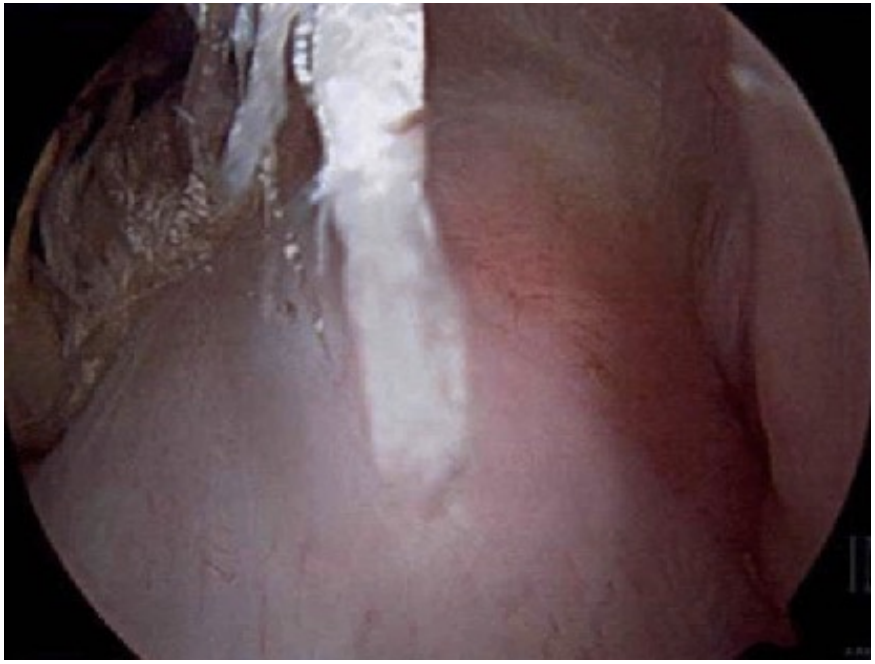


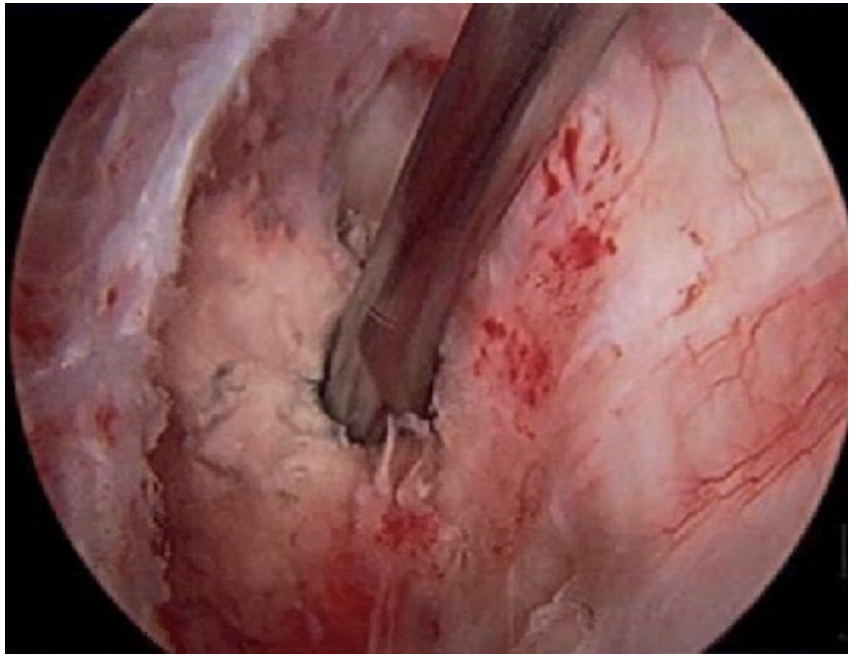
Operative plan

- Examination under anesthesia
- Diagnostic arthroscopy
- **PCL tunnel preparation**
- **PCL graft passage**
- **PCL tibial fixation**
- Posterolateral corner exposure/ nerve exposure
- Posterolateral corner socket/tunnel preparation
- Posterolateral corner fibula graft passage / fixation
- **PCL femoral fixation**
- Posterolateral corner femoral fixation

Arthroscopy

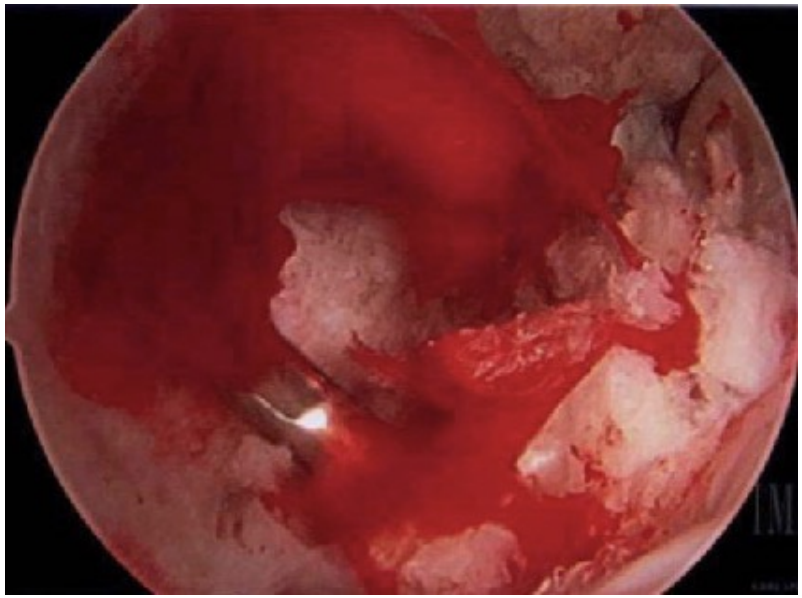




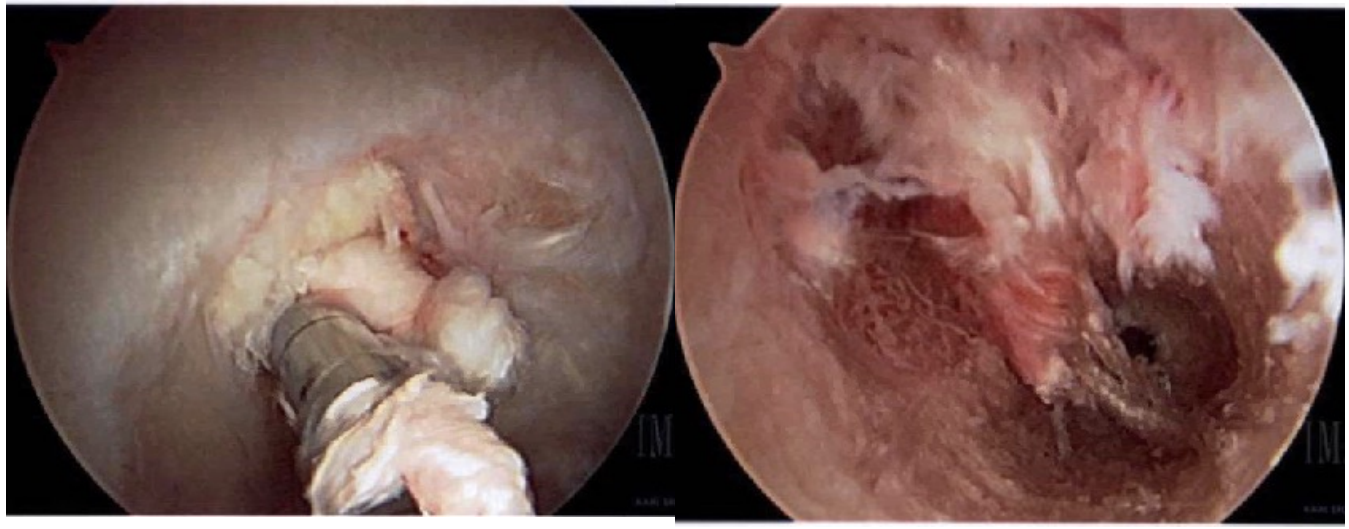


Arthroscopic PCL Reconstruction

Tibial tunnel

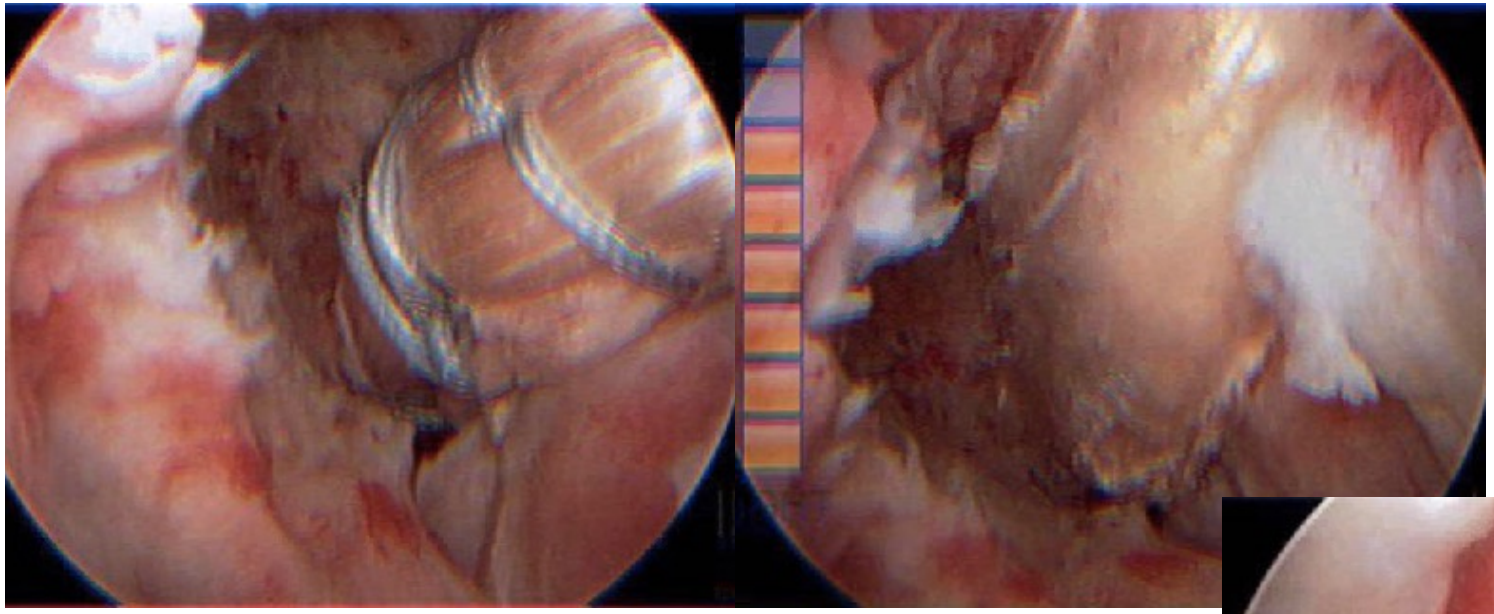


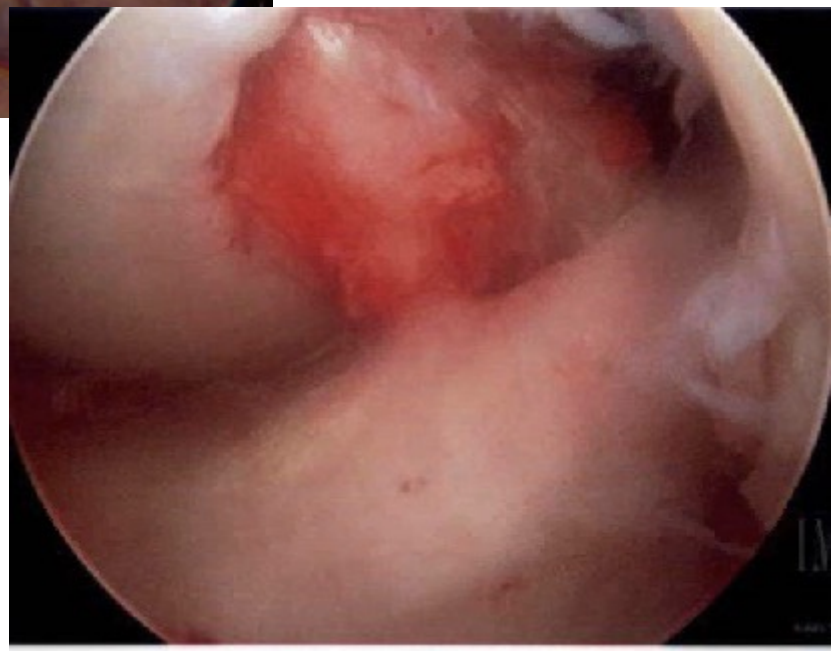
Femoral tunnel



Arthroscopic PCL Reconstruction

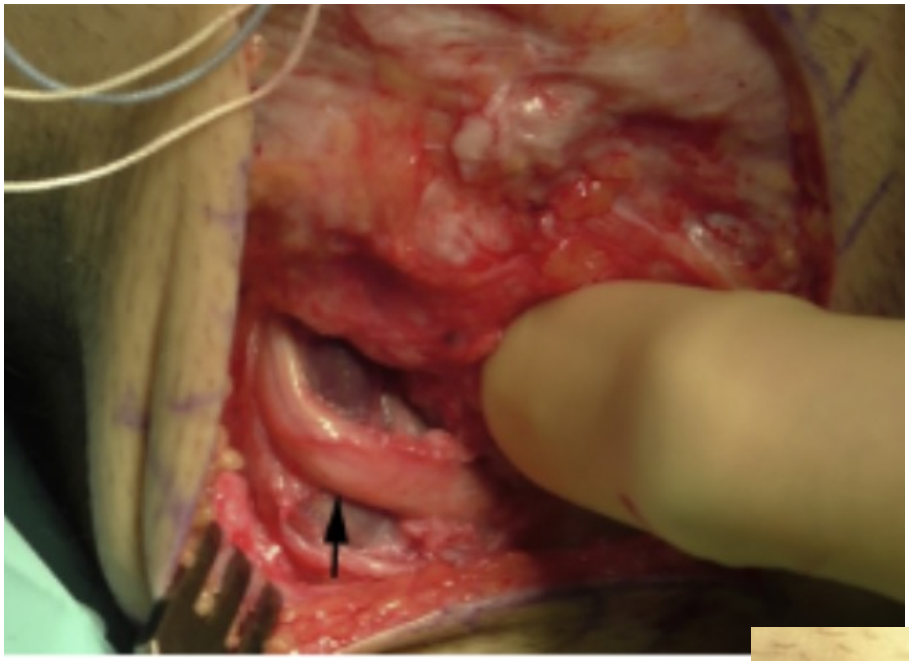
Graft passage



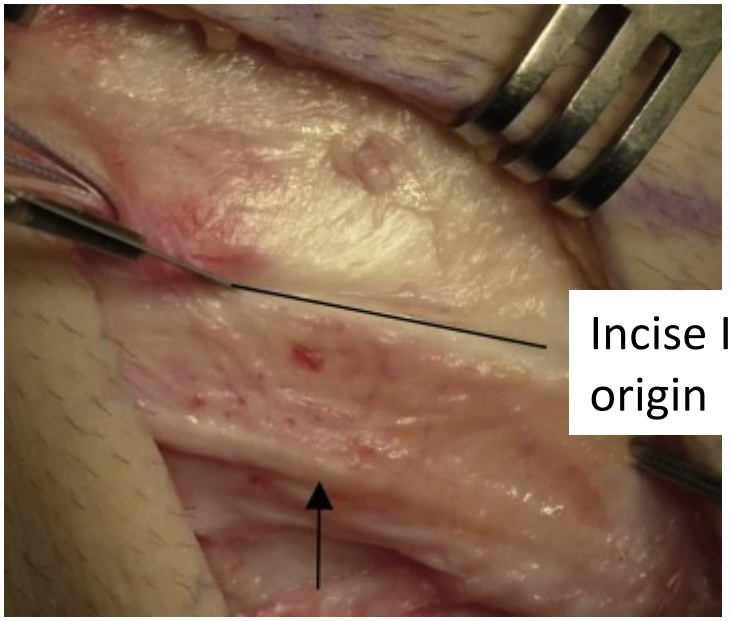


Posterolateral Corner Reconstruction

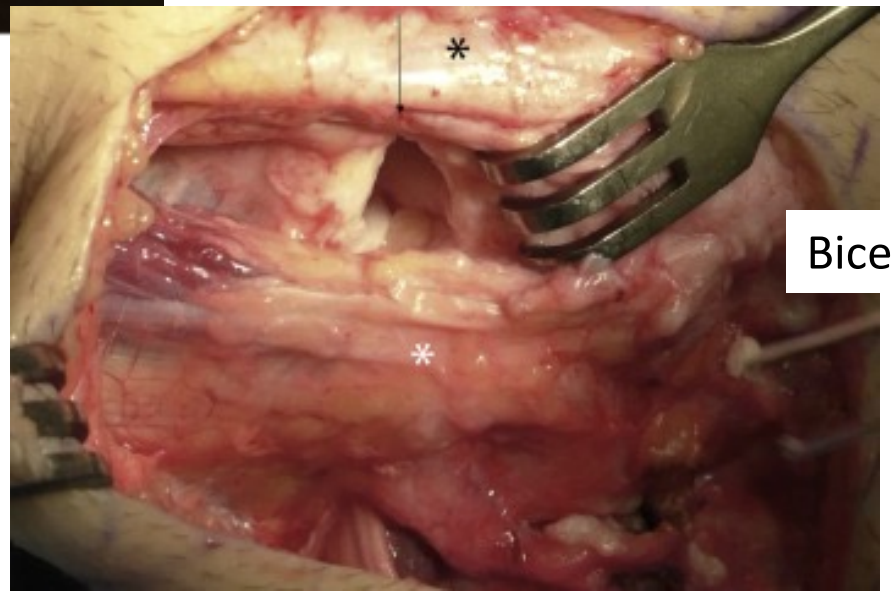
Peroneal N



Identify Biceps /ITB interval



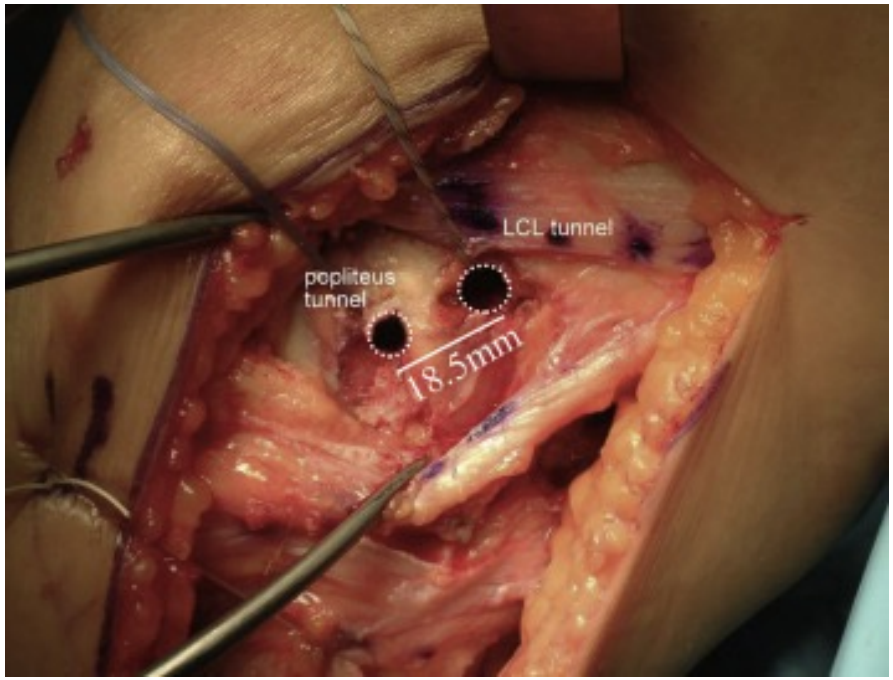
Incise ITB over femoral origin

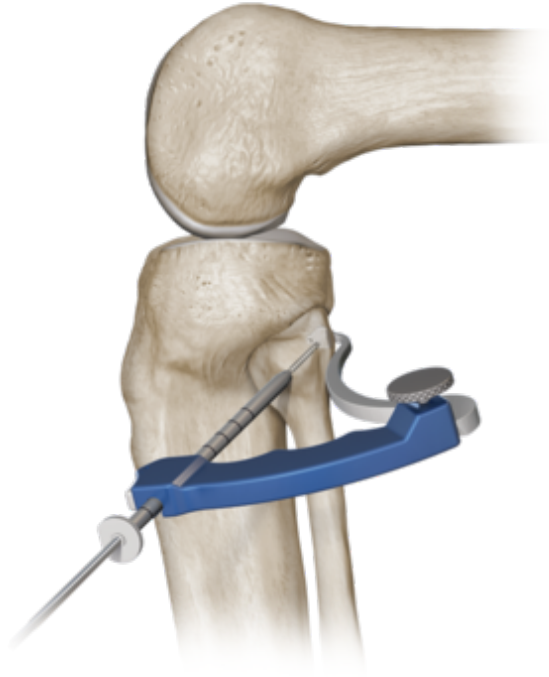


Biceps /ITB interval

Posterolateral Corner Reconstruction

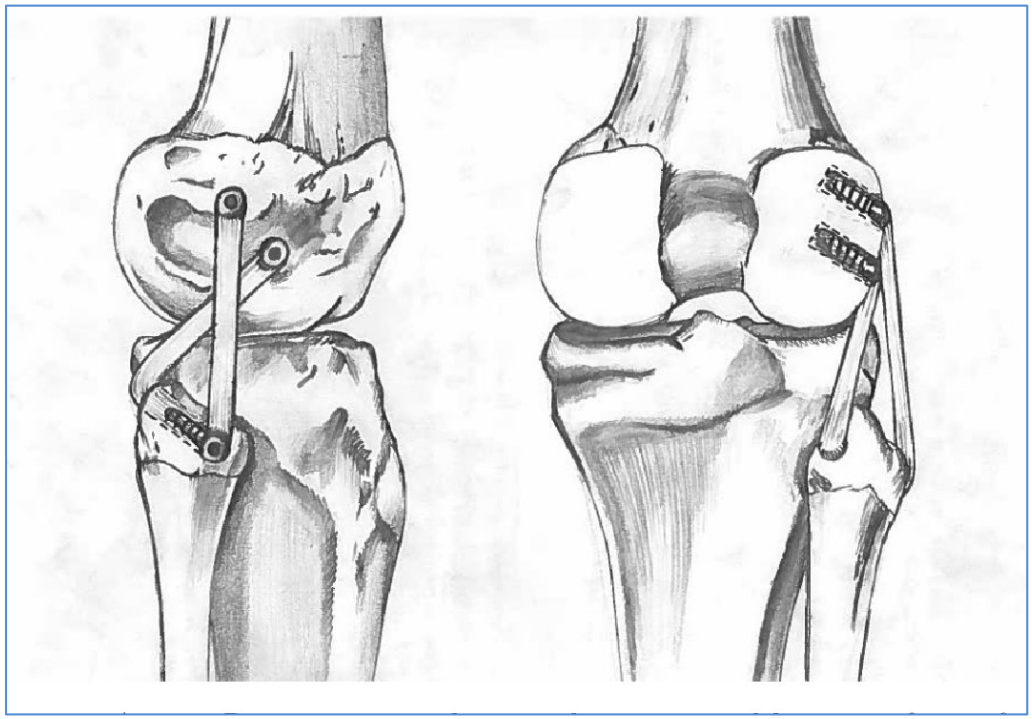
Arciero Technique

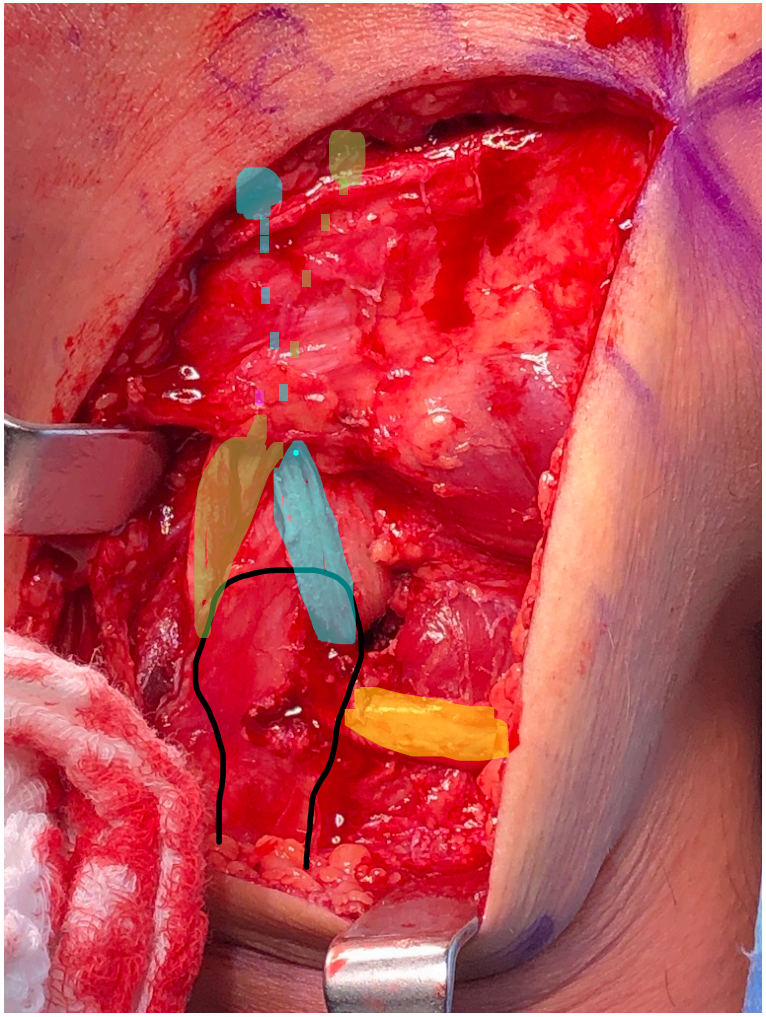


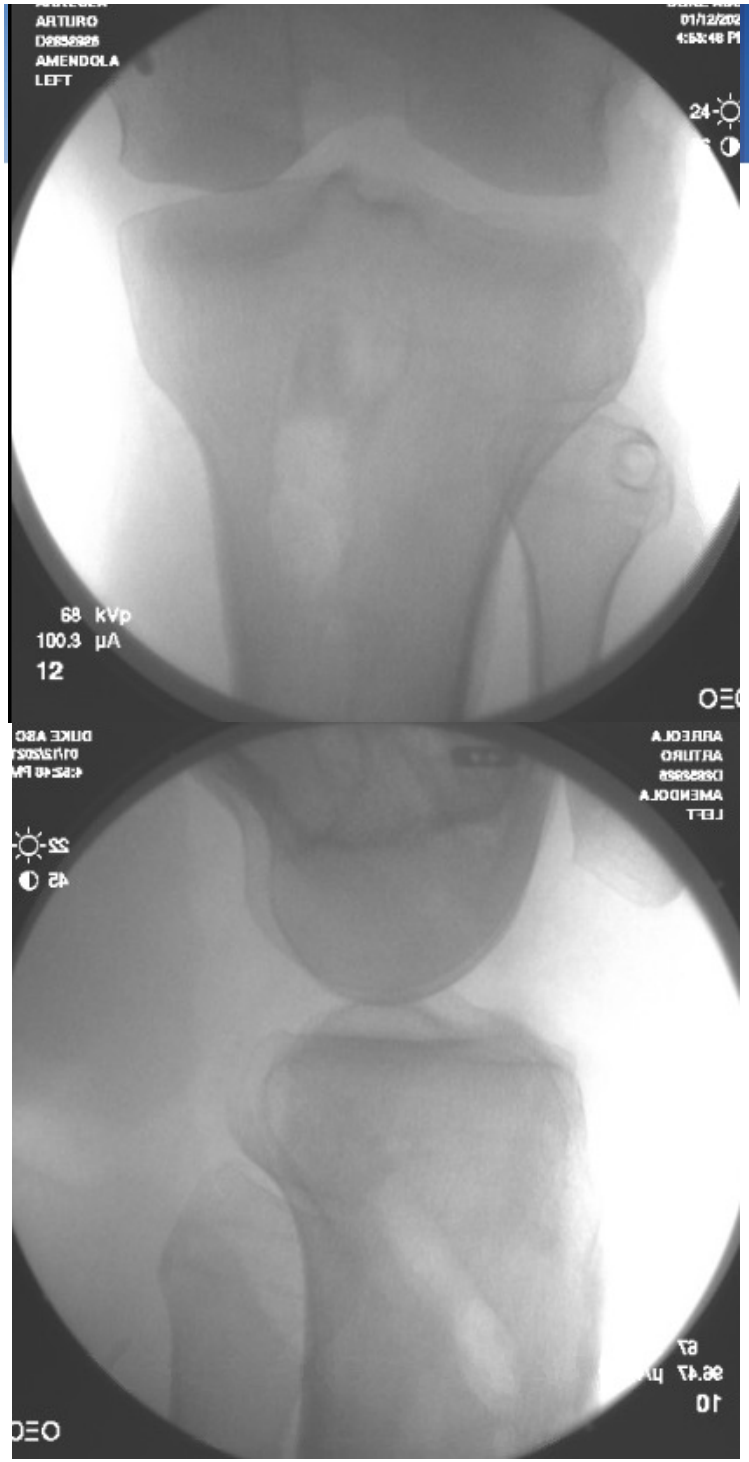


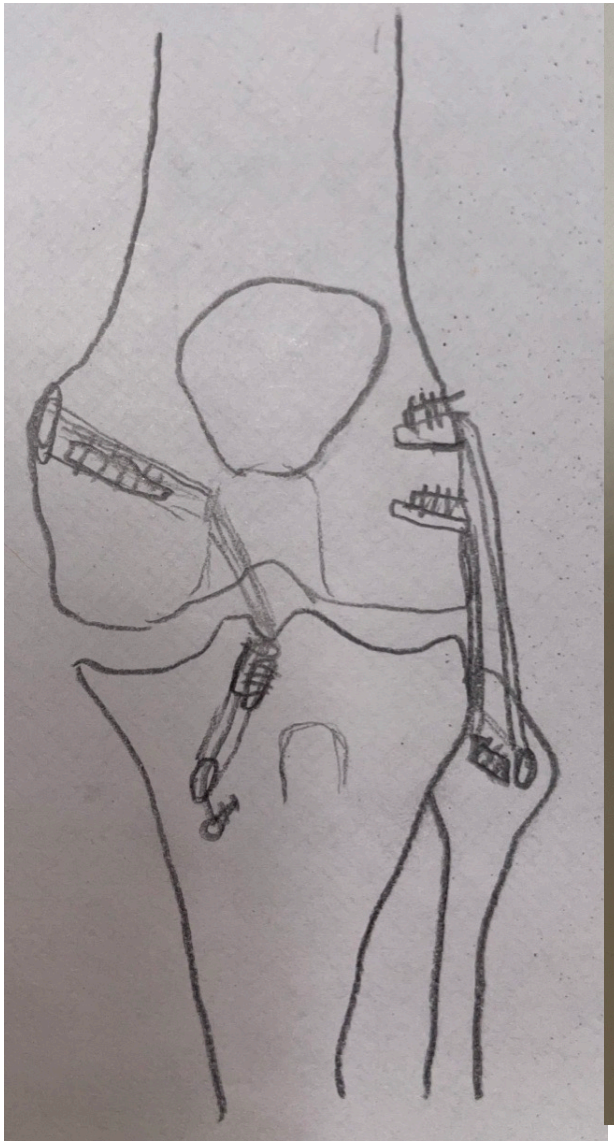
Posterolateral Corner Reconstruction

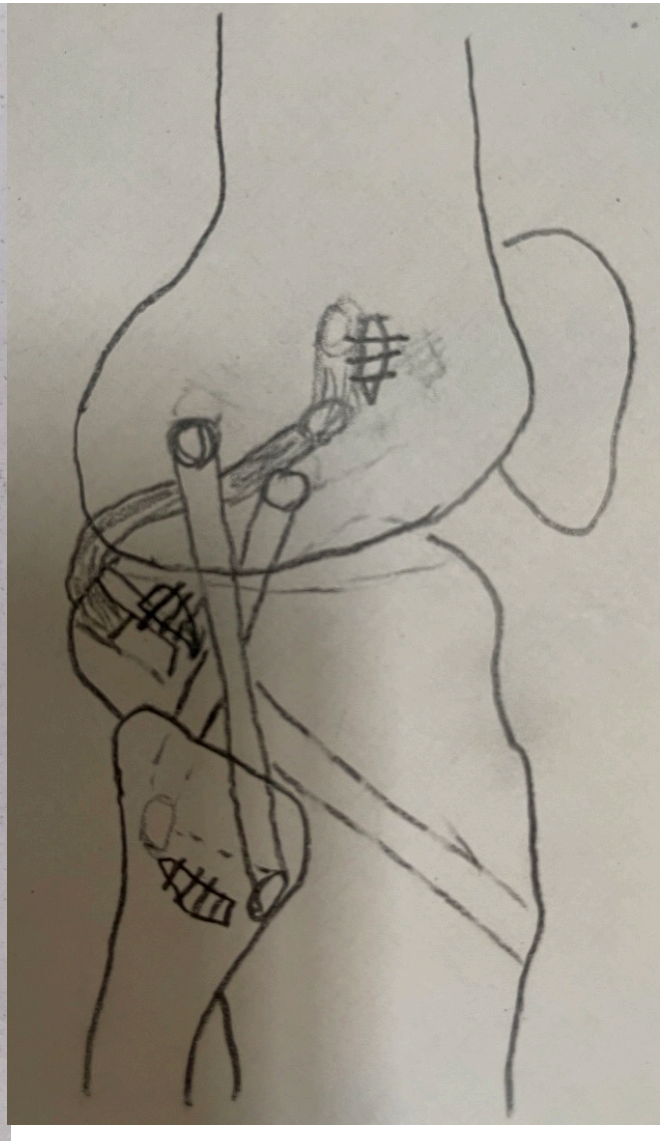
Arciero Technique






ARTURO
AMENDOLA
LEFT
68 kVp
100.3 µA
12





PLC injury Summary

- Acute injury
  - Clinical and MRI evaluation
  - Avulsive injury/ fracture
    - Early repair / recon
    - Cruciate reconstruction (allografts)
  - FCL/PLT repair/recon (ST allograft)


Thank you