Acute Knee Ligament Injuries in Athletes

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Acute Knee Ligament Injuries in Athletes
Main Menu

- Introduction
- Dislocation
- AMRI / ALRI
- ALRI
- PLRI
- Conclusions

Instabilities

- Anteromedial rotatory instabilities (AMRI)
- Combined AMRI and ALRI
- Anterolateral rotatory instabilities (ALRI)
- Straight posterior
- Posterolateral rotatory instabilities (PLRI)
- Combined ALRI and PLRI
- Straight instabilities

PCL

- Mechanism
  - Low velocity – sports blow to anterior tibia, foot plantarflexed
- Exam
  - Grades I-II-III based on relation to medial femoral condyle
- Assess collateral ligaments
  - Most commonly posterolateral instability
  - Greater tibial external rotation
- Acute reconstruction
  - Knee dislocation
  - Grade III collateral ligament injuries

PCL – 22 YO Offensive Lineman







Straight posterior instability

Normal Knee Exam: PCL Exam



Knee dislocation ACL/PCL/MCL tears
Skin only stabilizing medial side of the knee

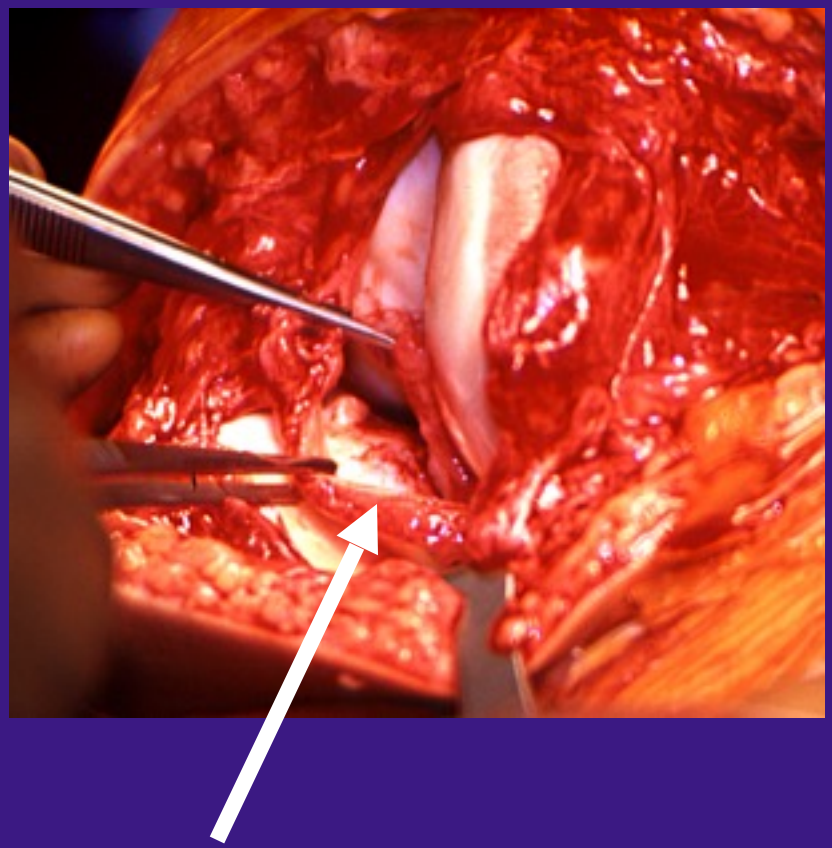


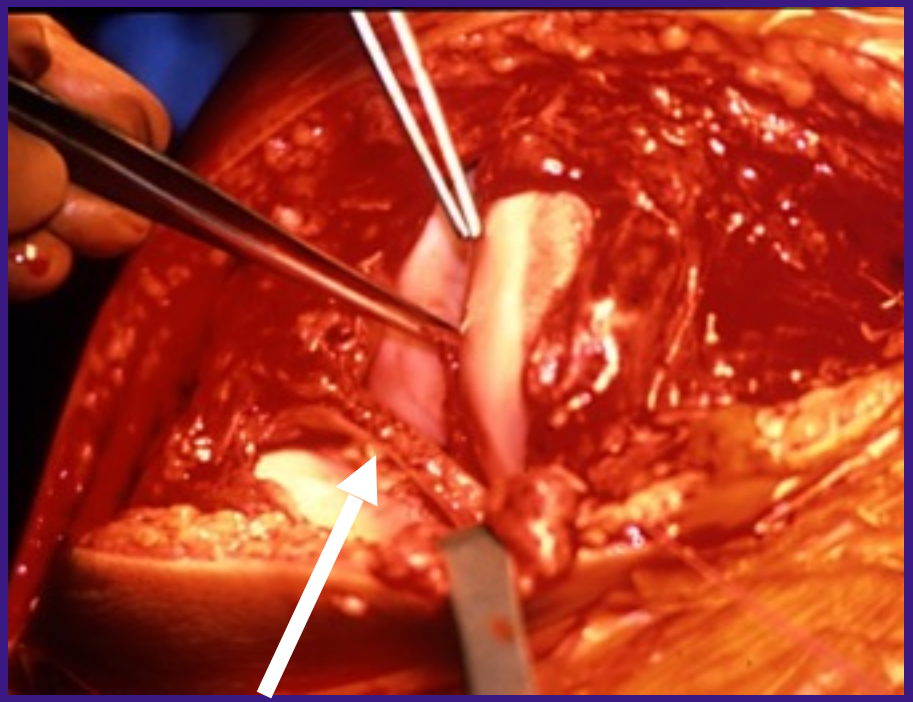


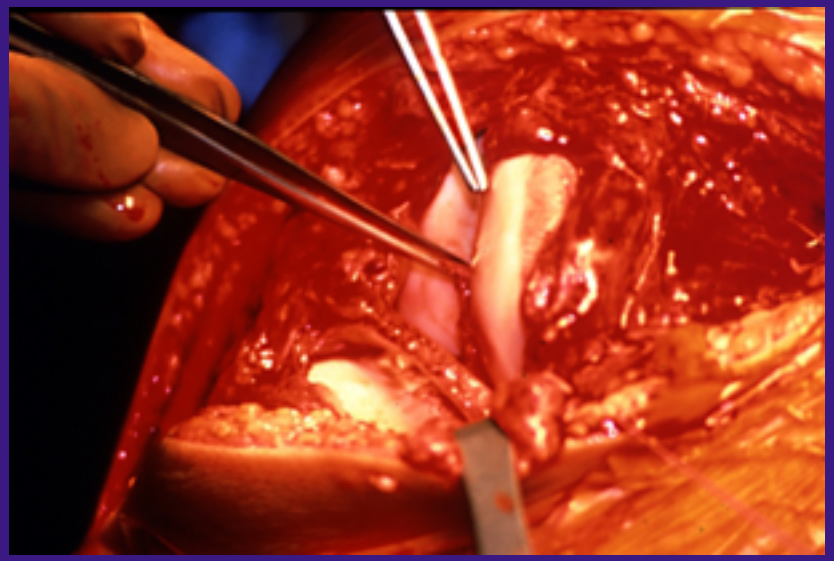


Combined instabilities: AMRI, ALRI, Straight posterior

Medial meniscus

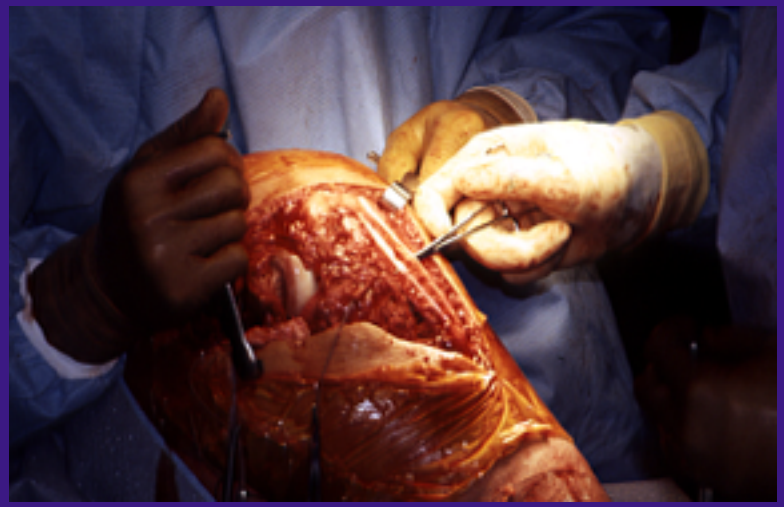






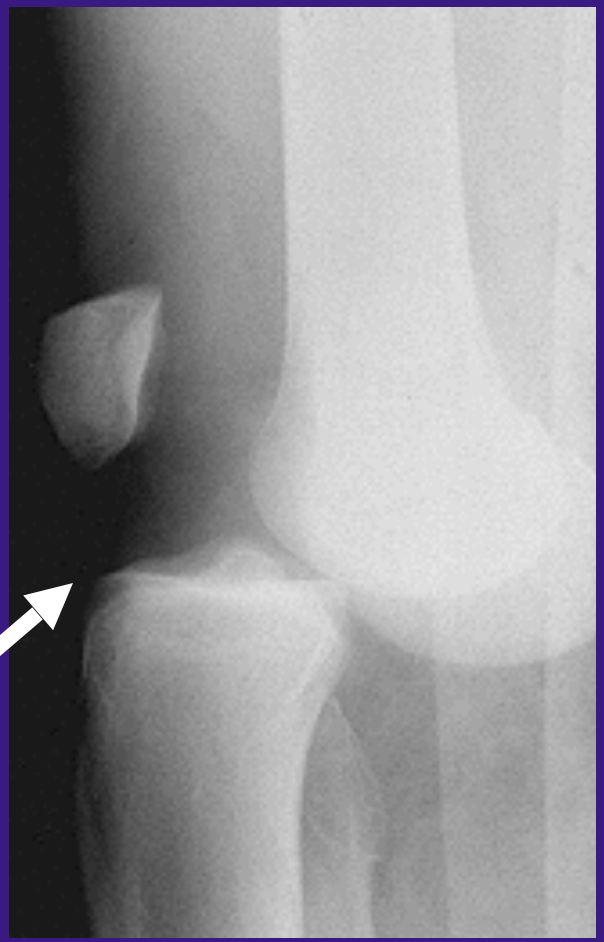






Acute Knee Dislocations

- Uncommon, but . . .
  May be underdiagnosed
- If knee opens up to varus/valgus stress testing in extension, assume a knee dislocation
- Direction of dislocation
  - Anterior: hyperextension mechanism
  - Posterior: direct blow anterior proximal tibia



KNEE



Knee Dislocation

- Happens on fields – not often, but:
- Don’t miss
- Assess vascular status
  - Physical exam
  - Pulse ratios
  - MRI scan
  - Arteriogram

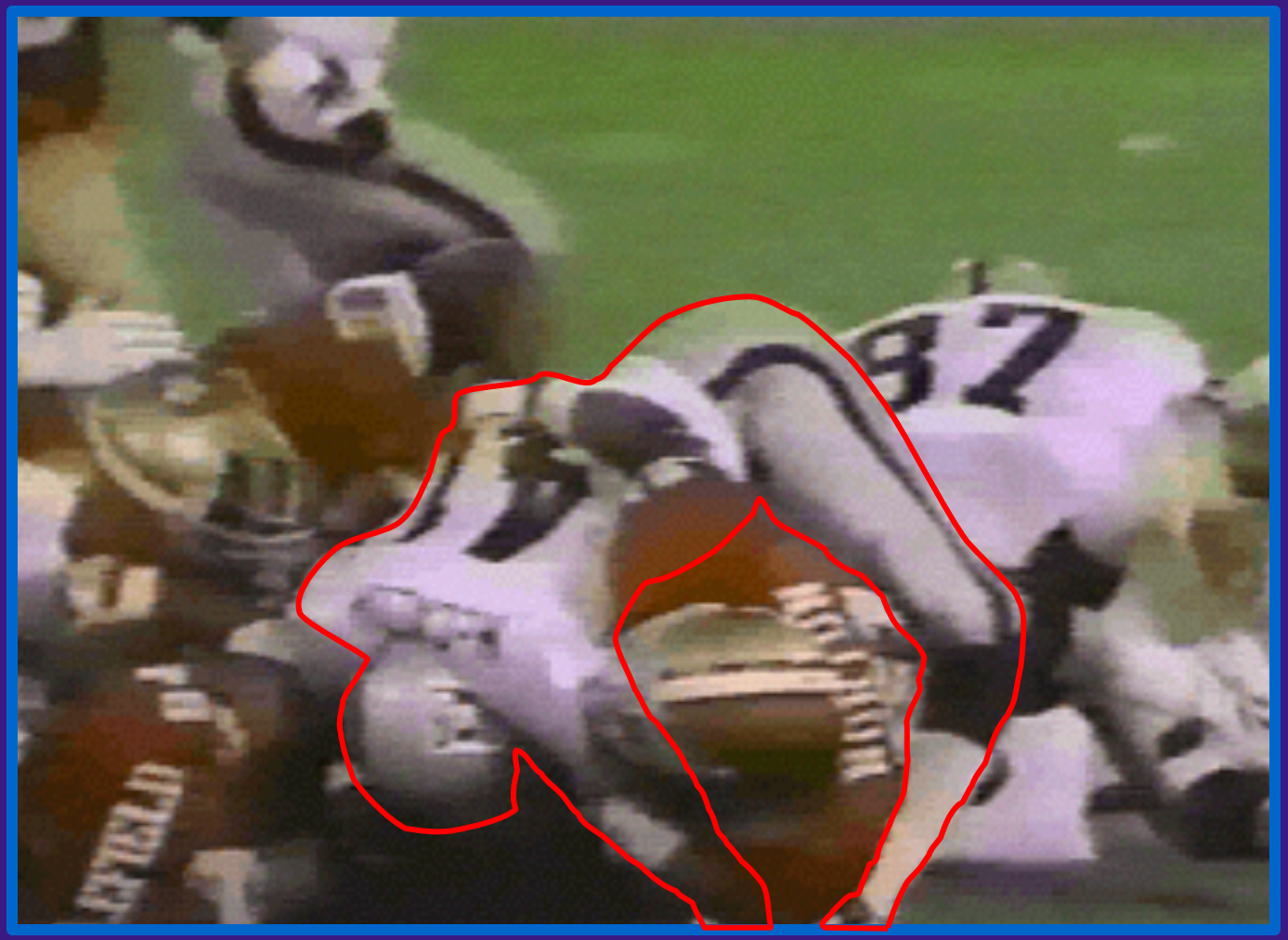



Knee Unstable in Extension. . .

Marcus Lattimore, running back, MOI: South Carolina vs. Tennessee



Football: Knee Dislocation



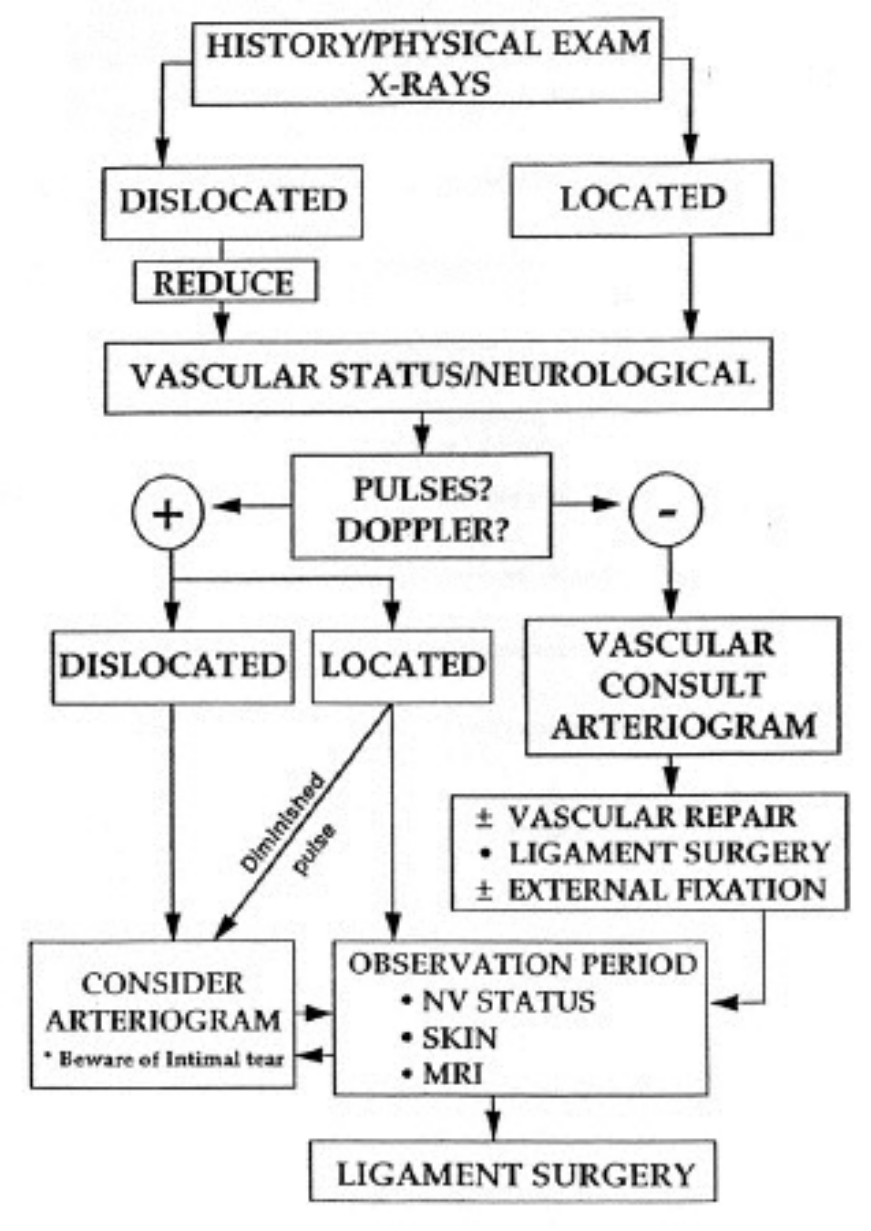
Willis McGahee, Univ. of Miami 2003



Knee Dislocations

- Most knee dislocations reduce spontaneously
- Refer to center with vascular surgeon
- Communicate with ER
  - Use your cell phone to call the ER
  - Put a note on the patient
  - Transfer to facility with angiography suite and vascular surgeon on call
- If high suspicion, do arteriogram

Knee Dislocation Algorithm



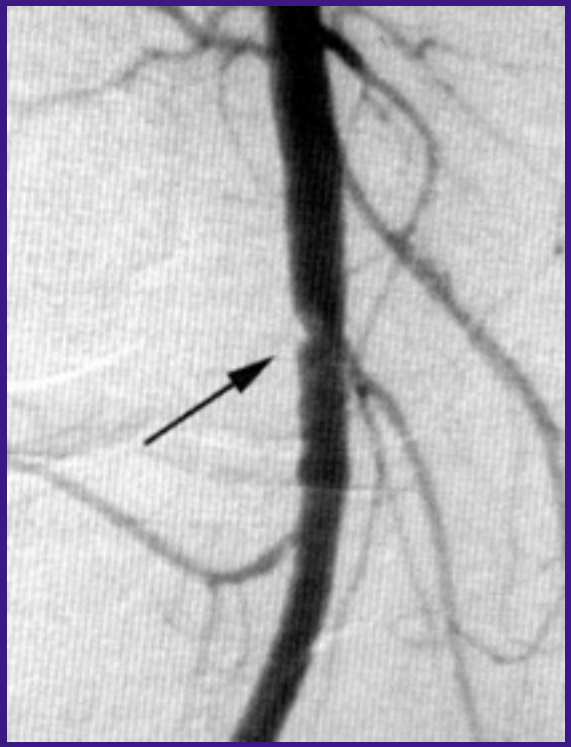
Algorithm for treatment of the Multiple Ligament Injured Knee, from Harner, CD, "Complex Knee Injuries including dislocation: Preoperative planning, evaluation and pitfalls," AAOS, Phoenix AZ, Feb. 3-6, 2000.

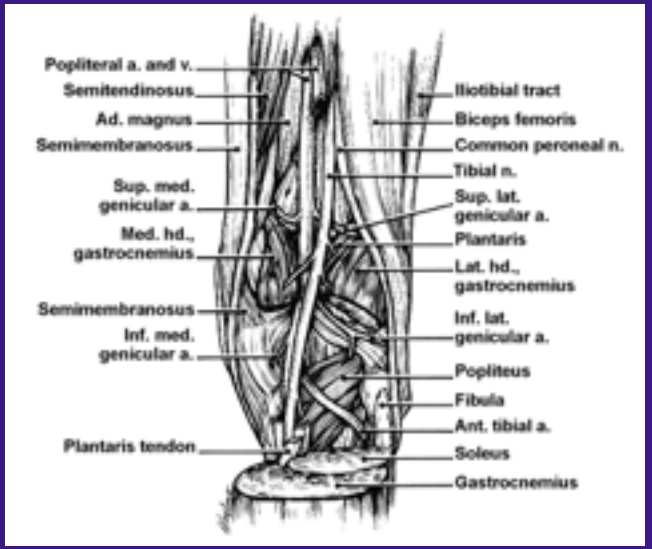
Vascular Injury

Arteriogram Gold Standard

Injury ranges from :
- Thrombus
- Tear:
  - Intimal
  - Partial
  - Complete

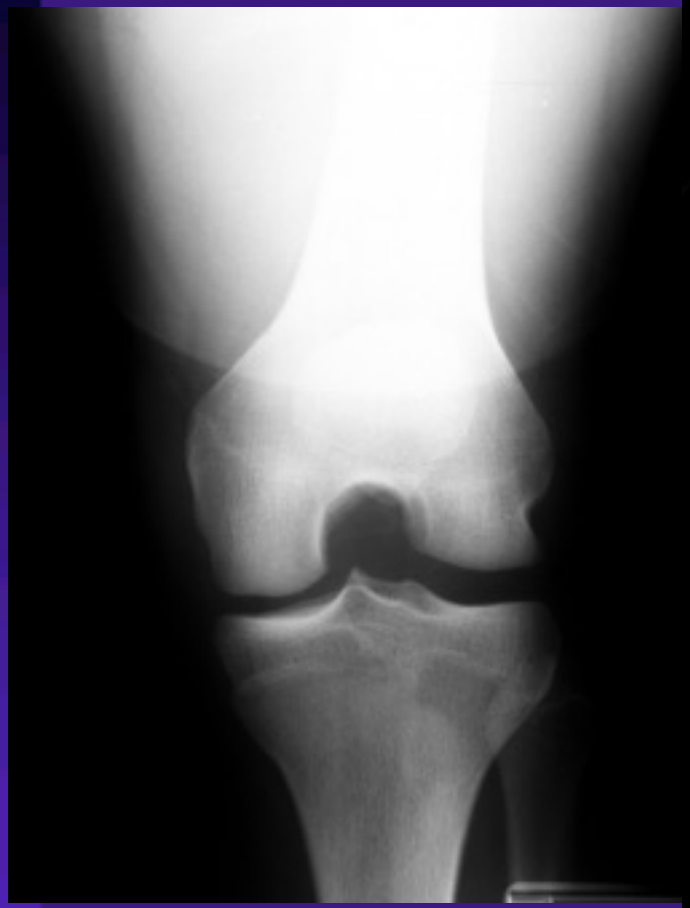
Late Vascular compromise from:
- Thrombus
- Propagation of Intimal Tear





History

- 16YO white male, high school football player
- Football game, valgus twisting blow to body injury
- Unable to keep playing
- Evaluated on sideline, seen in ER
- Seen in office 3 days later

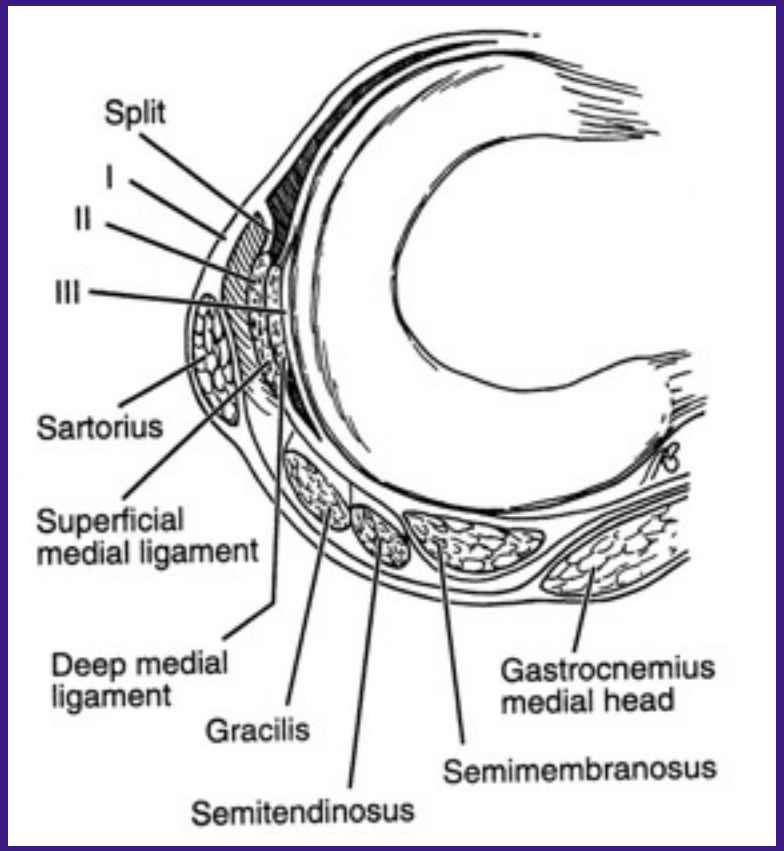


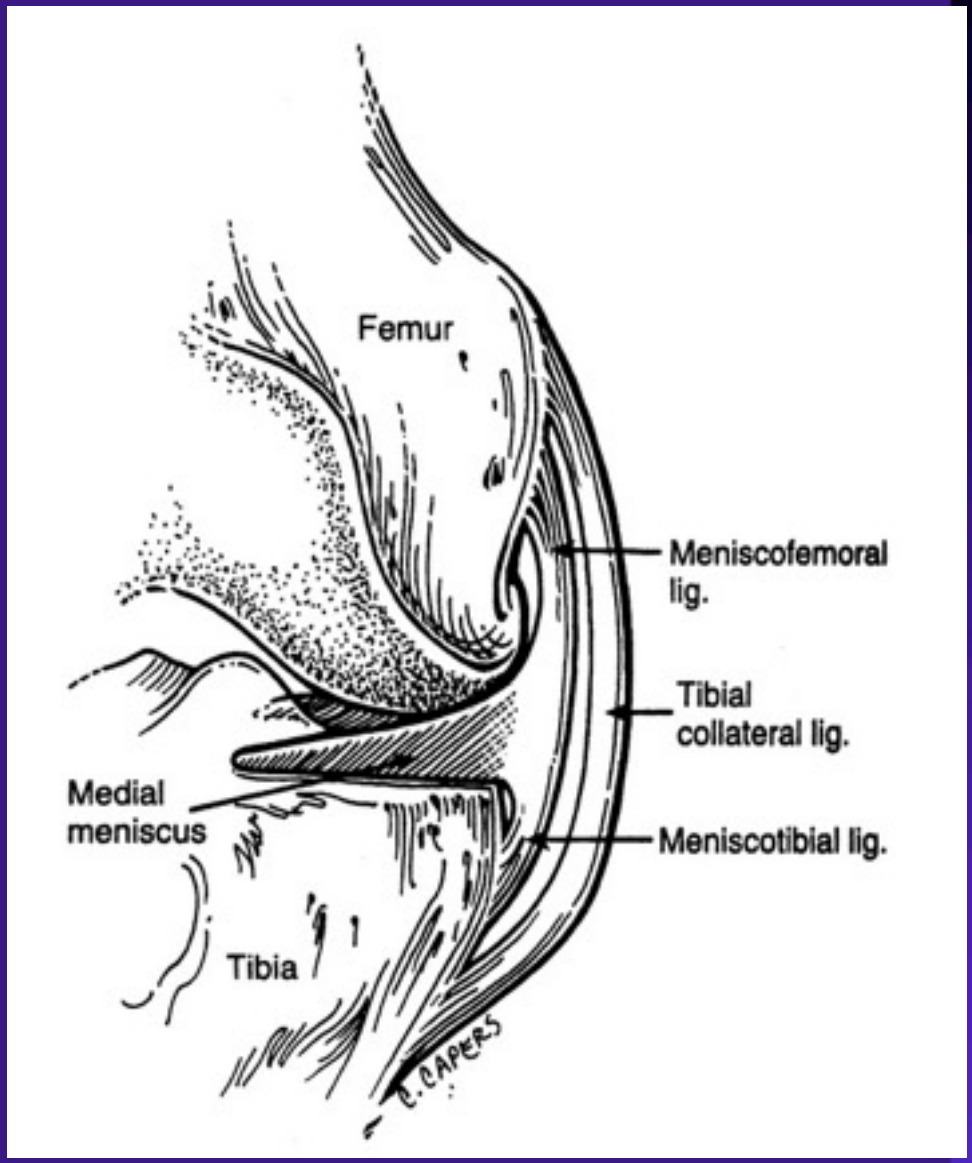




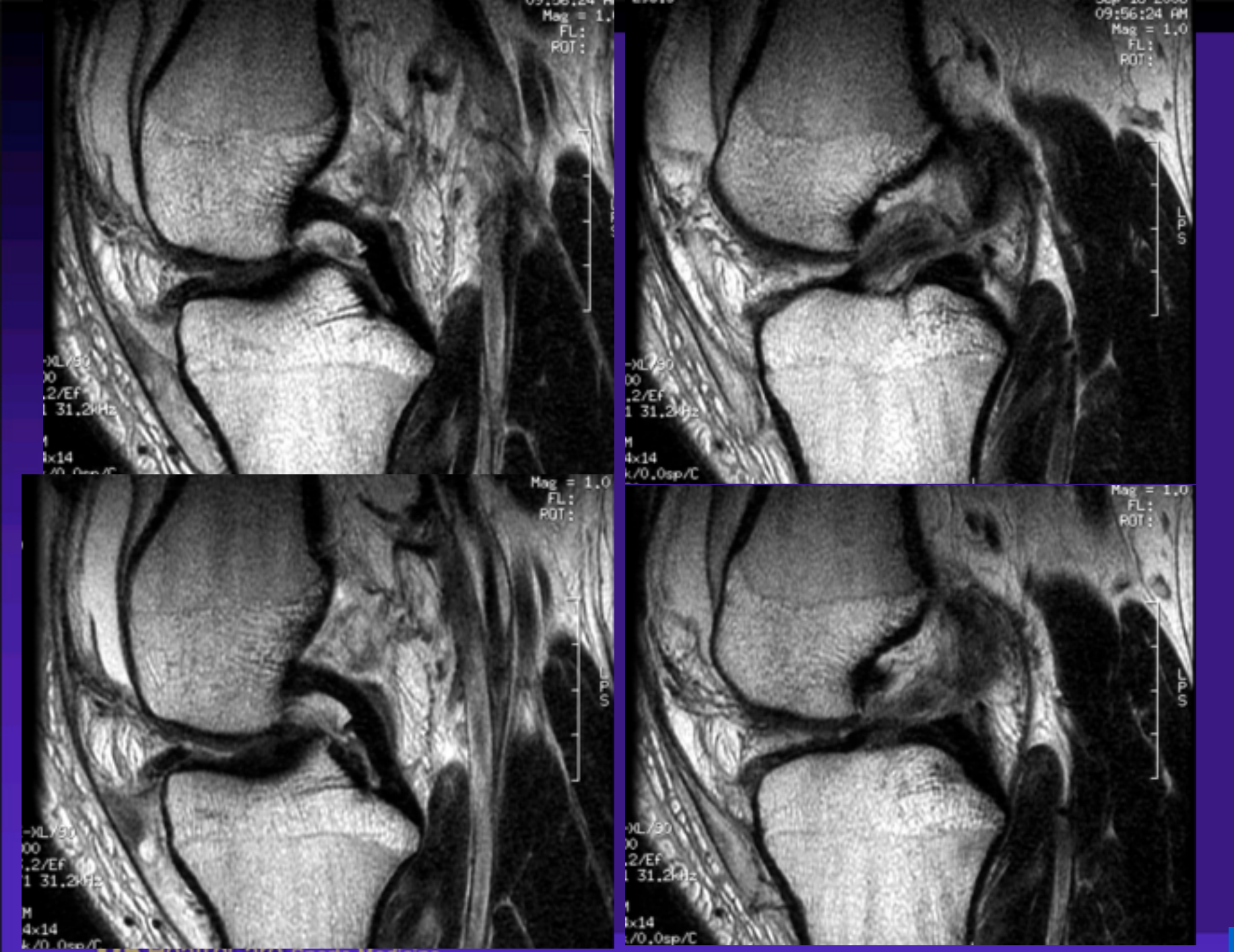


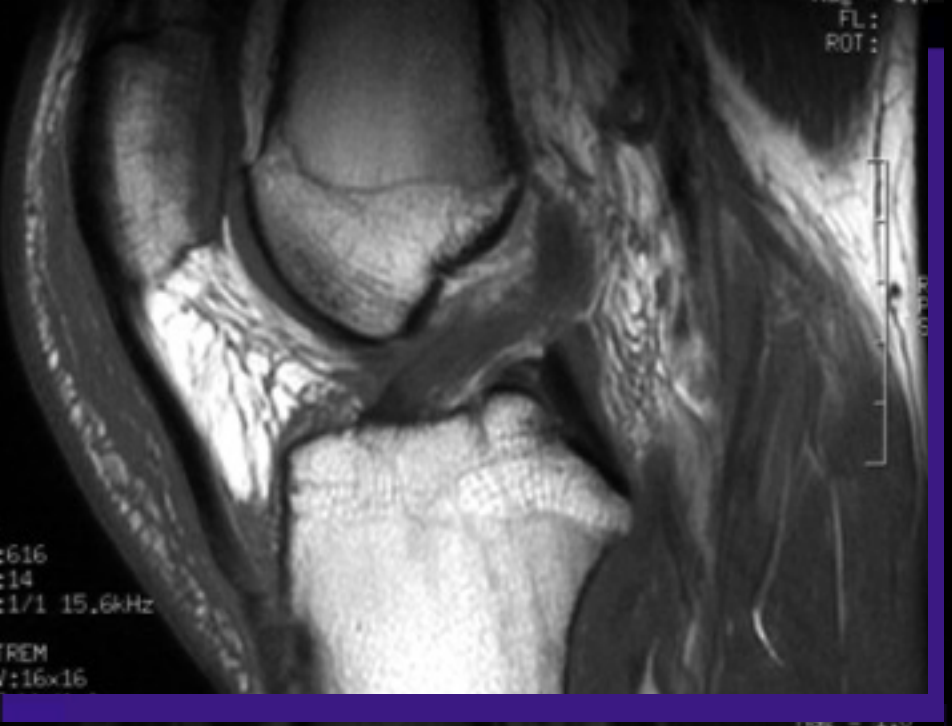

13
SE-XL/90
3450
82.7/Ef
1/1 31.2kHz
REM
:16x16
thk/1.0sp


Split
I
II
III
Sartorius
Superficial medial ligament
Deep medial ligament
Gracilis
Semitendinosus
Semimembranosus
Gastrocnemius medial head


Femur
Meniscofemoral lig.
Tibial collateral lig.
Medial meniscus
Meniscotibial lig.
Tibia
C. CAPERS


Mag = 1.0
FL:
ROT:
ET:8
R
A
JP
FSE-XL/90
TR:2466
TE:35.2/Ef
EC:1/1 20.8kHz
EXTREM
FOV:16x16
4.0thk/1.0sp


09:56:24 AM
Mag = 1.0
FL:
ROT:
LPS







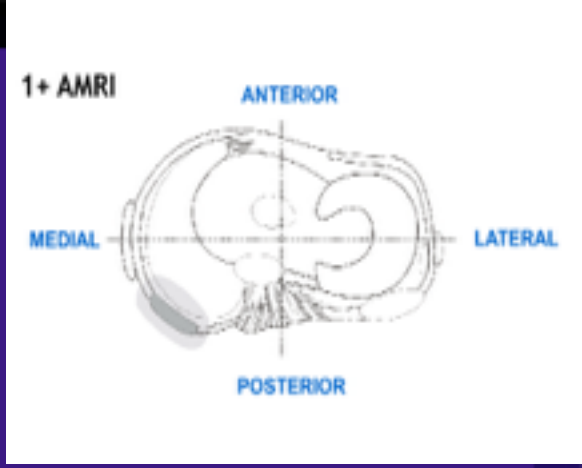


GE Healthcare Sports Medicine

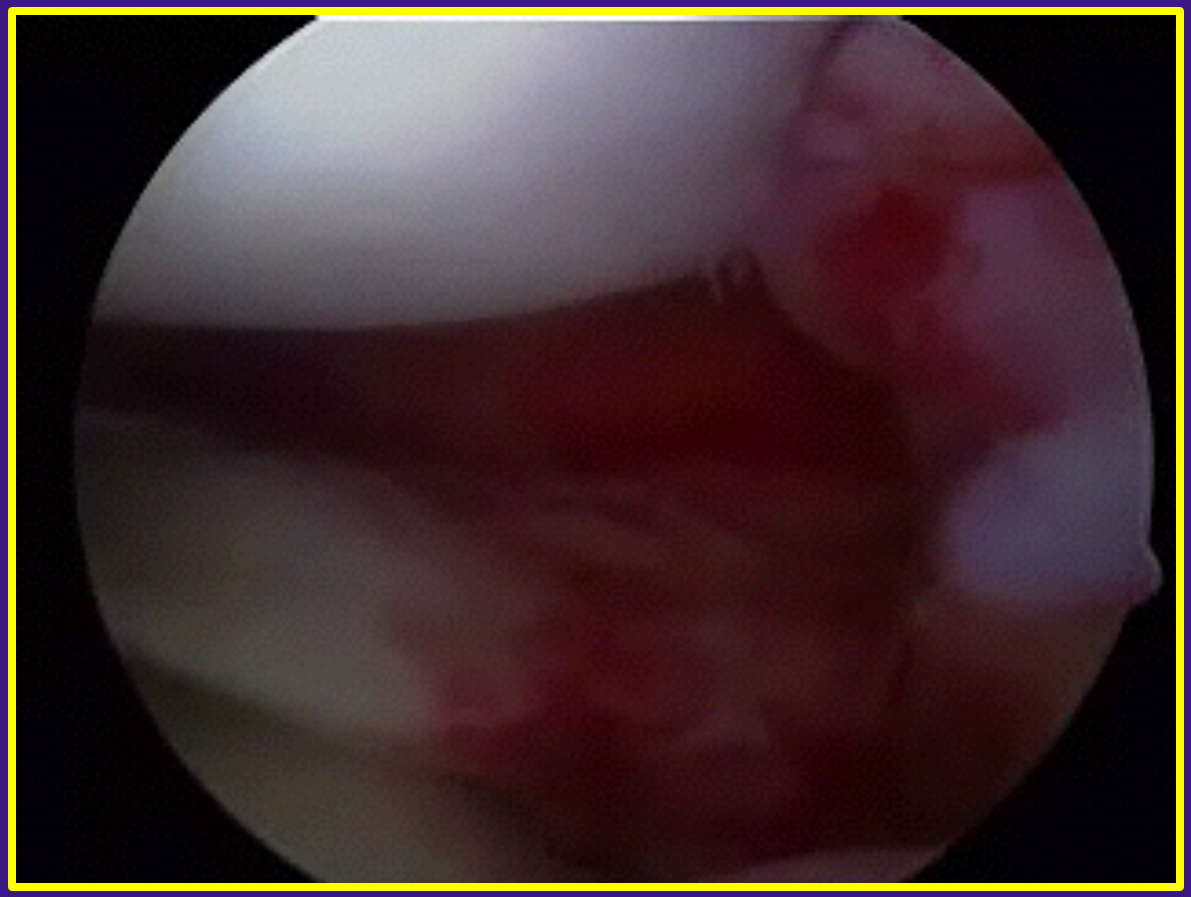
Knee Instabilities

AMRI

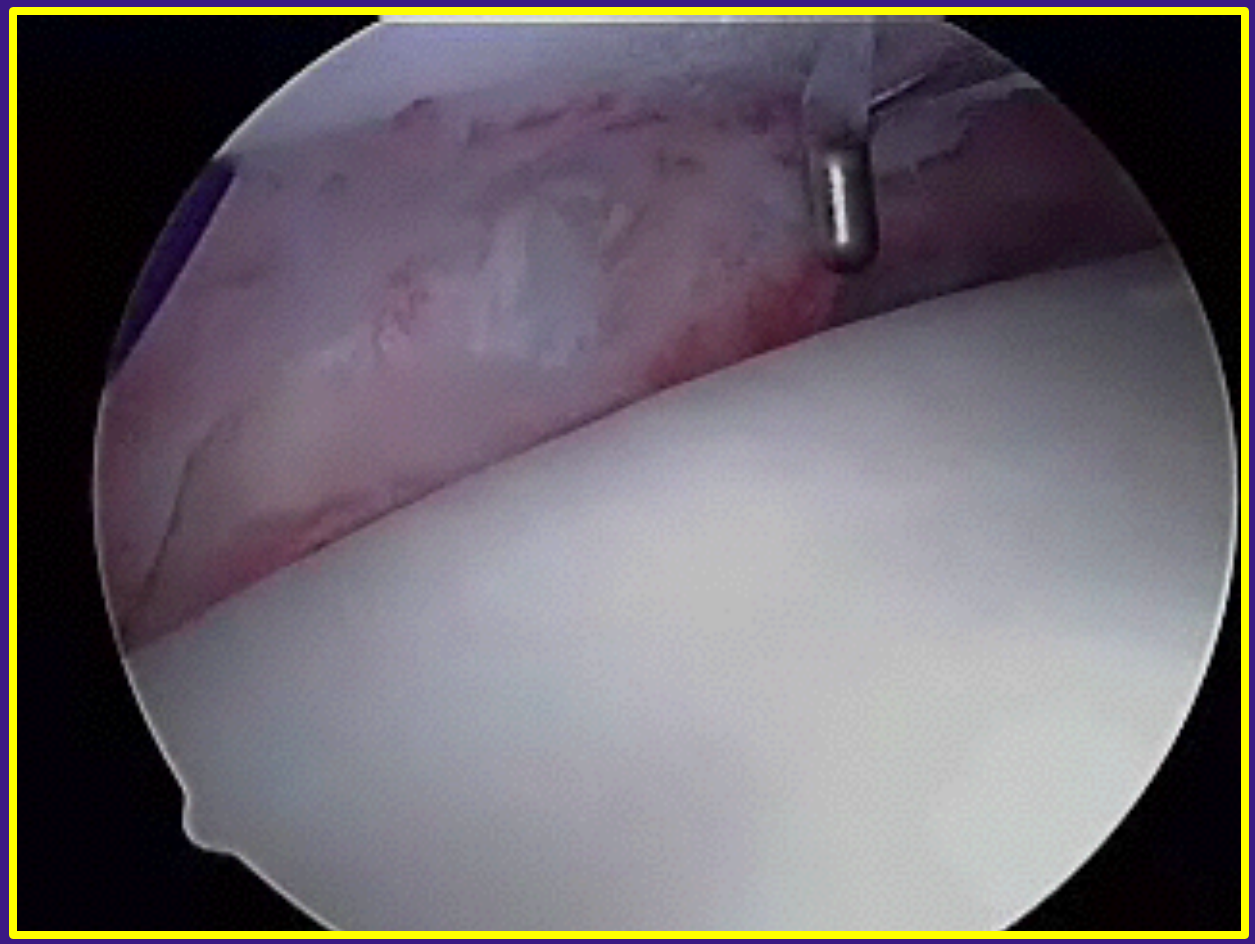




Surgery: Arthroscopy

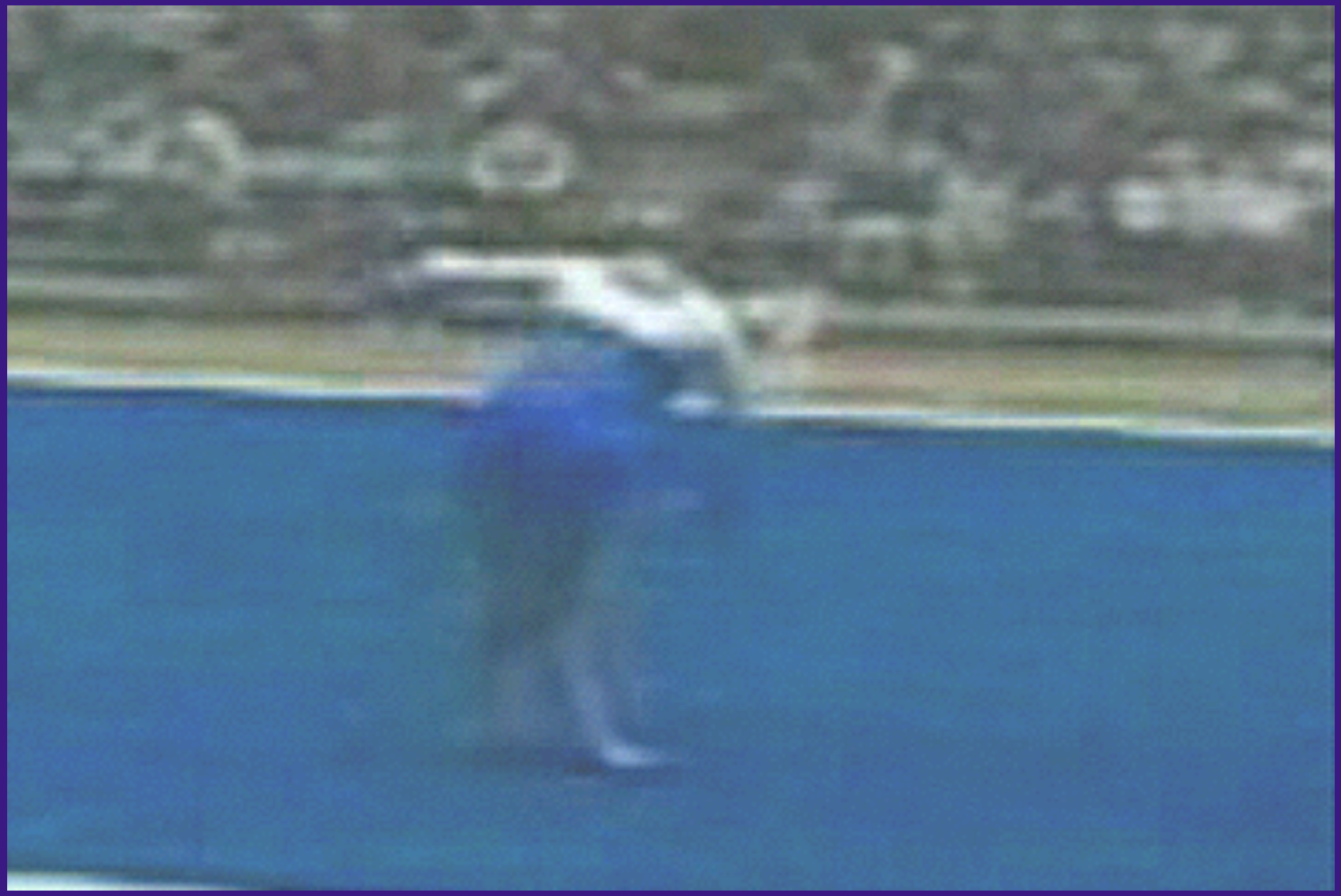


Surgery: MCL Repair



Gymnastics





ACL Tear



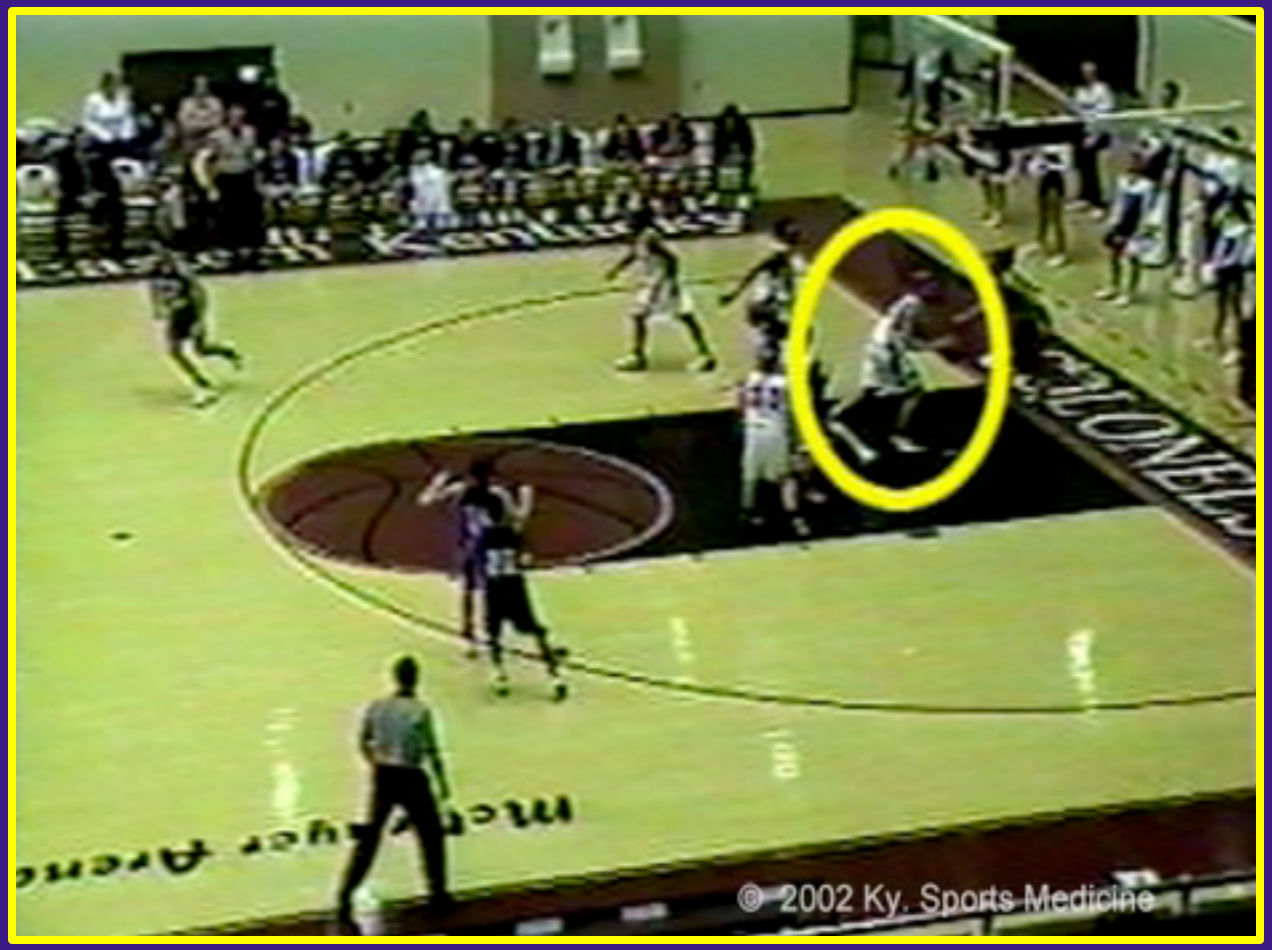
Basketball

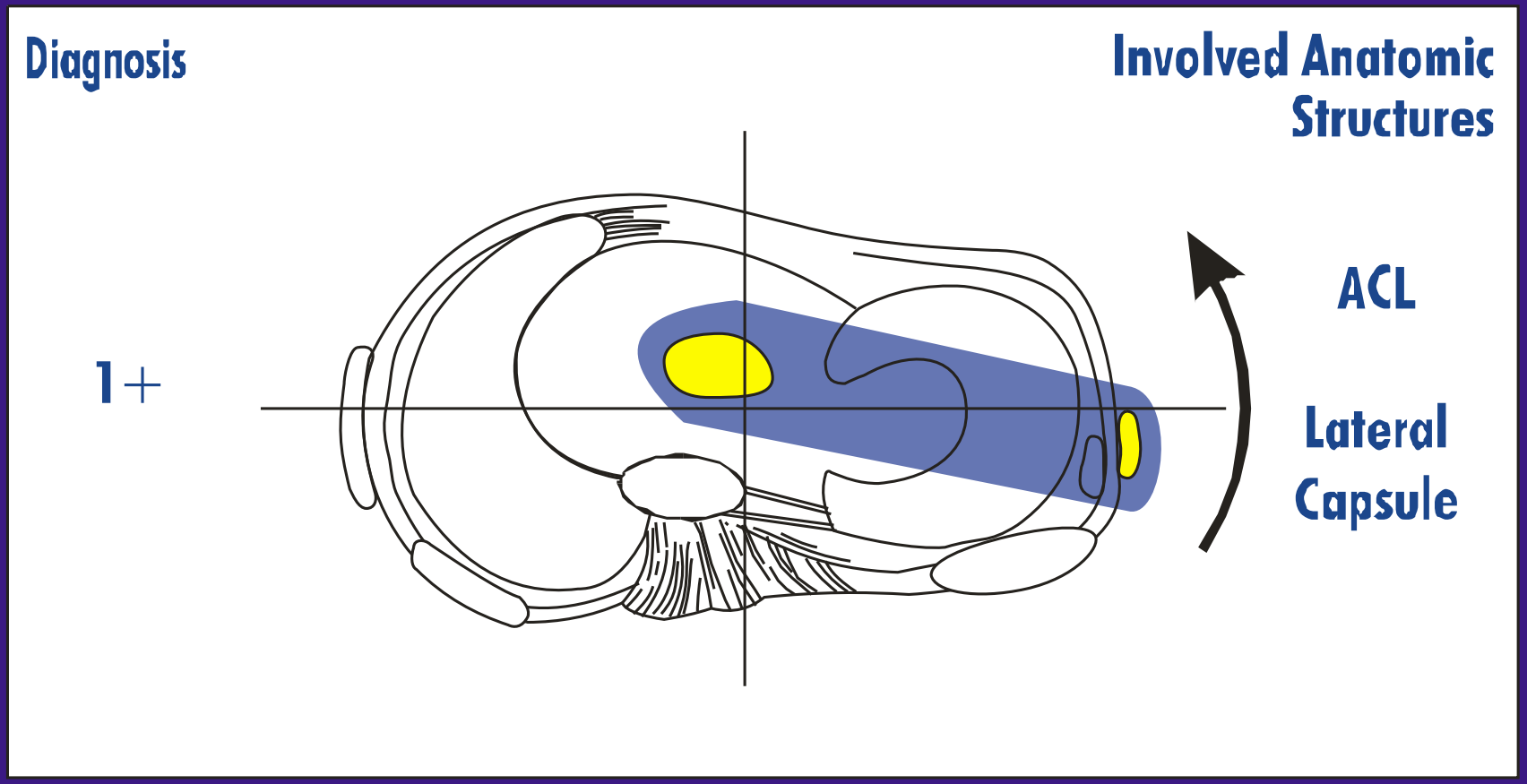


Basketball



Basketball: non-contact, unexpected, not thinking

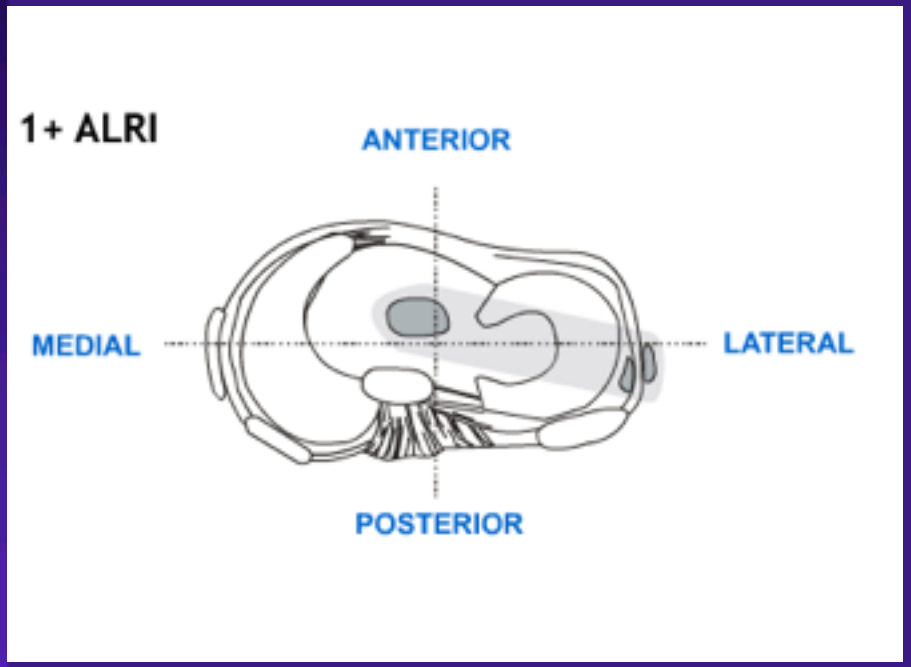


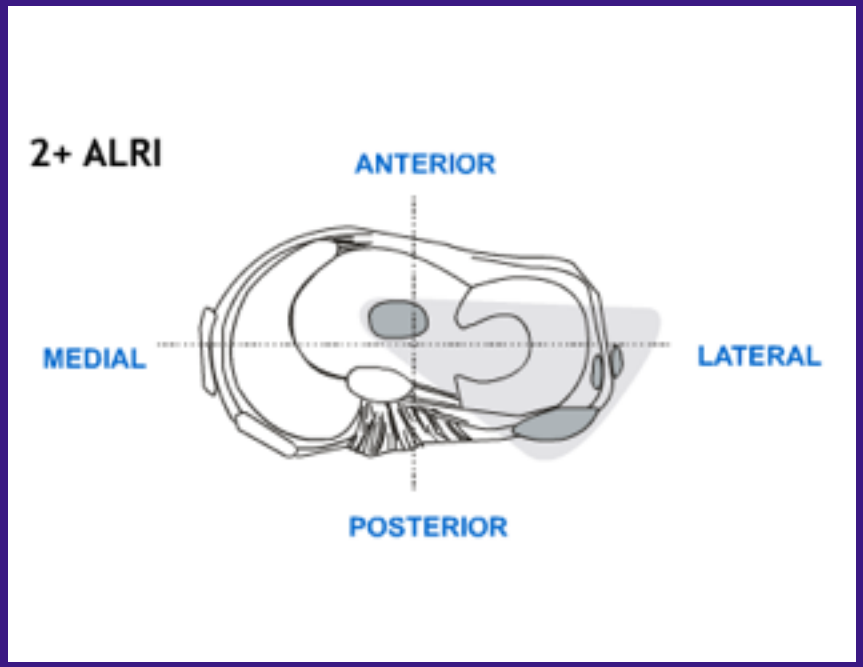


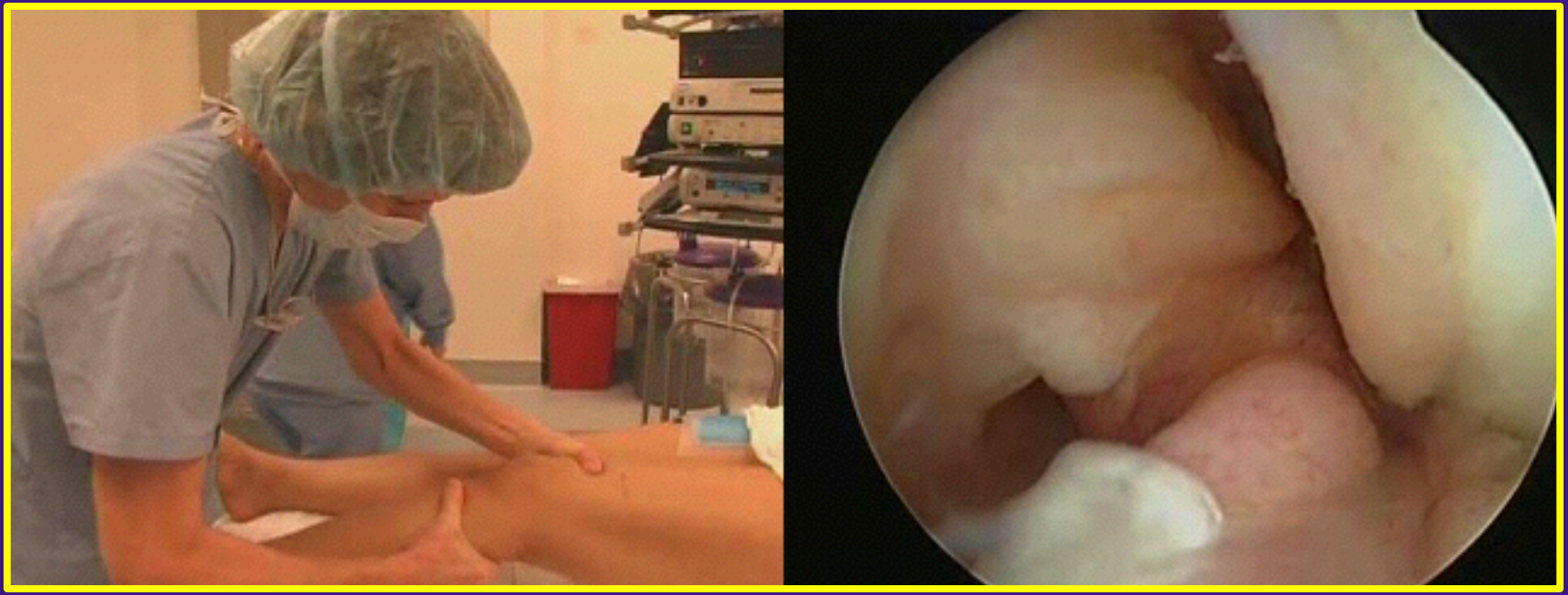
Antero-Lateral Rotatory Instabilities (ALRI)

Knee Instabilities

ALRI

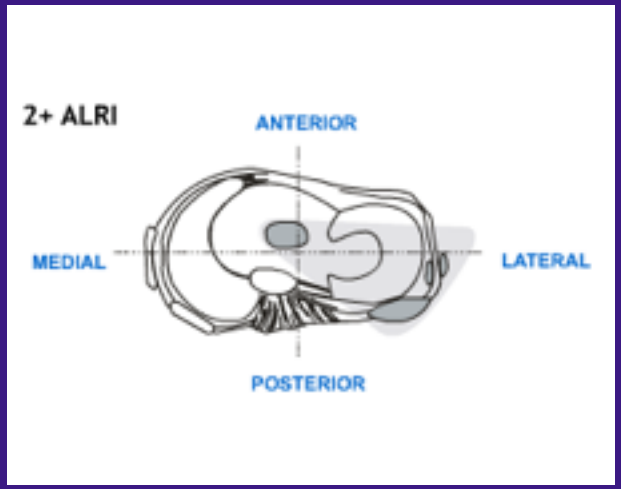


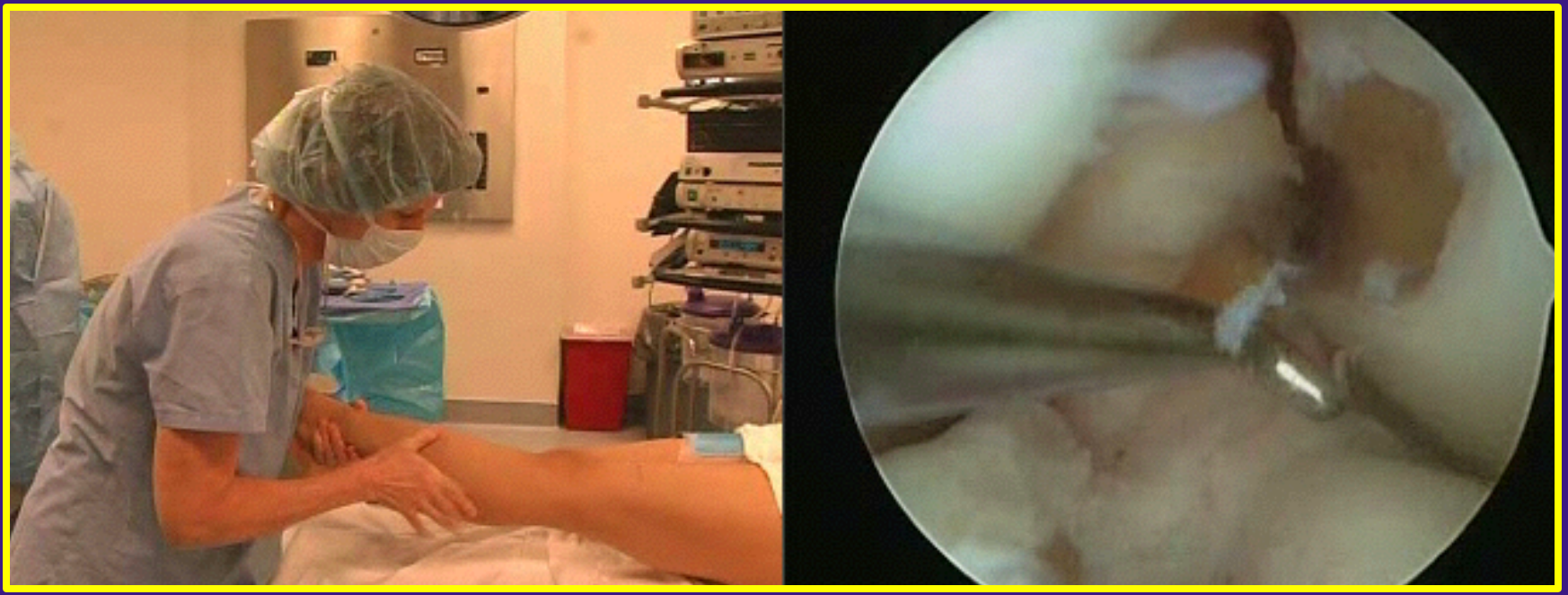




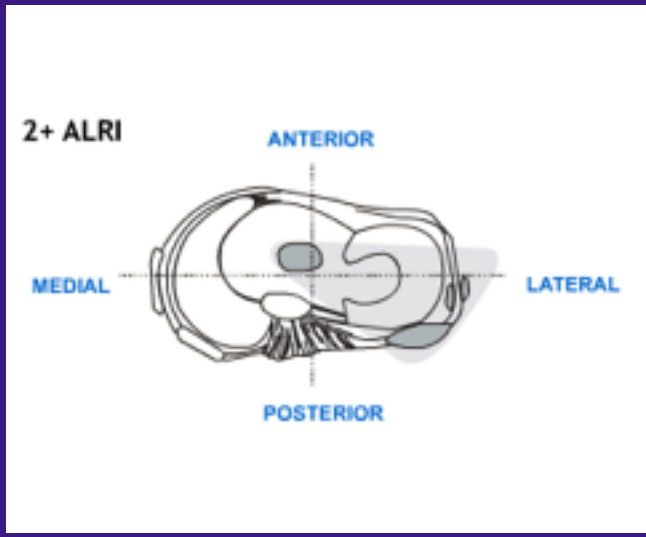
EUA:

Correlate mechanism of injury, anatomy, surgical findings to study design in the lab





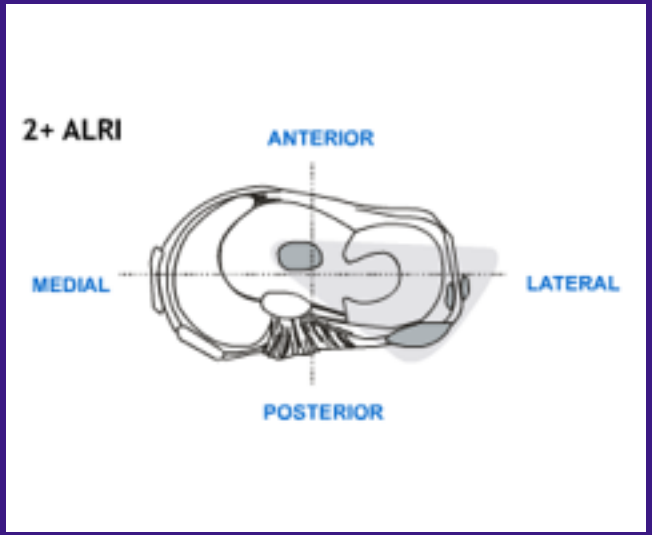
Pivot Shift
Lateral tibial plateau internally rotating, anteriorly subluxing at 30 to 0 degrees



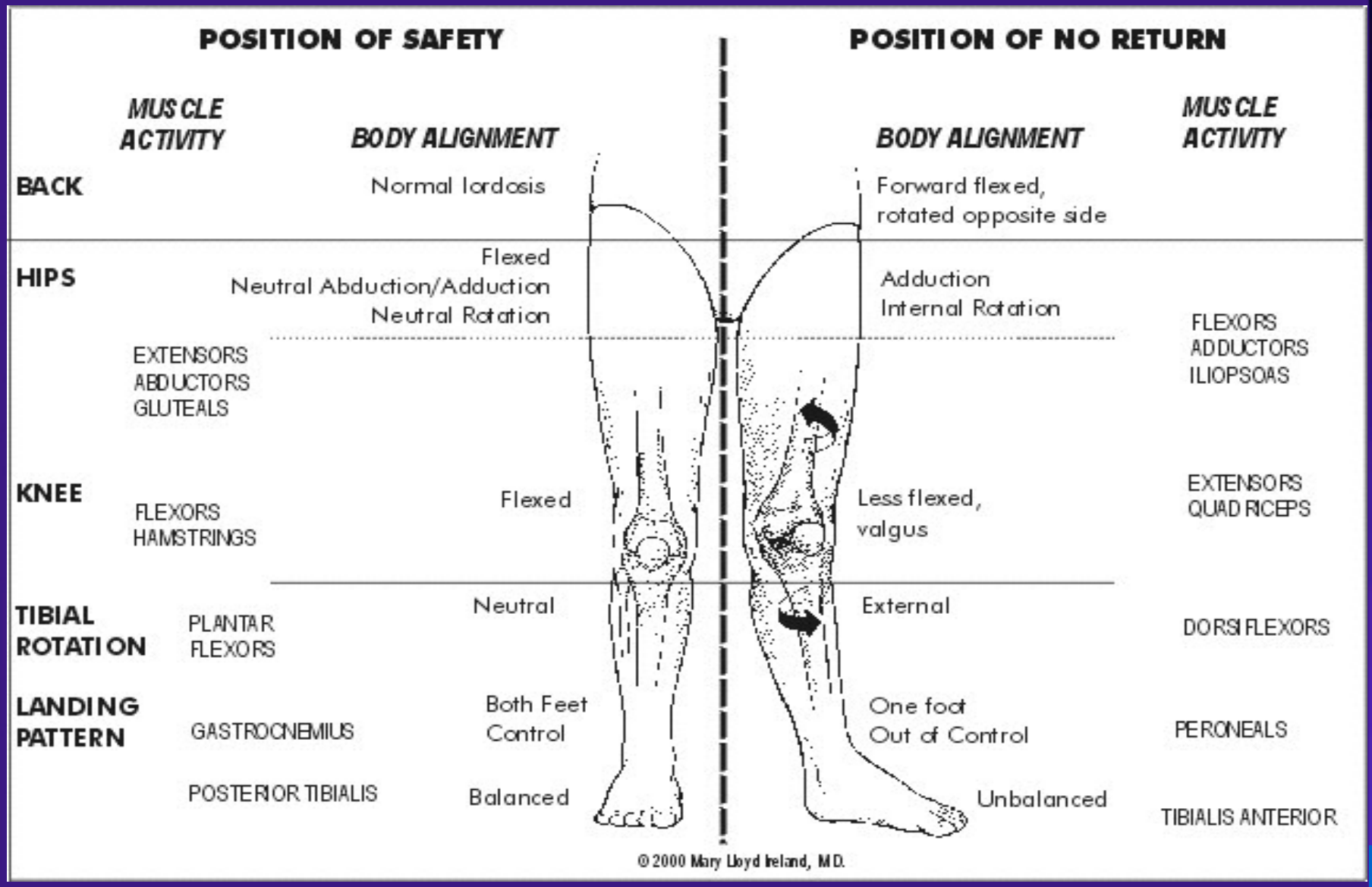


Medial compartment:

compressive forces posterior medial meniscus, typical tear pattern vertical, posterior

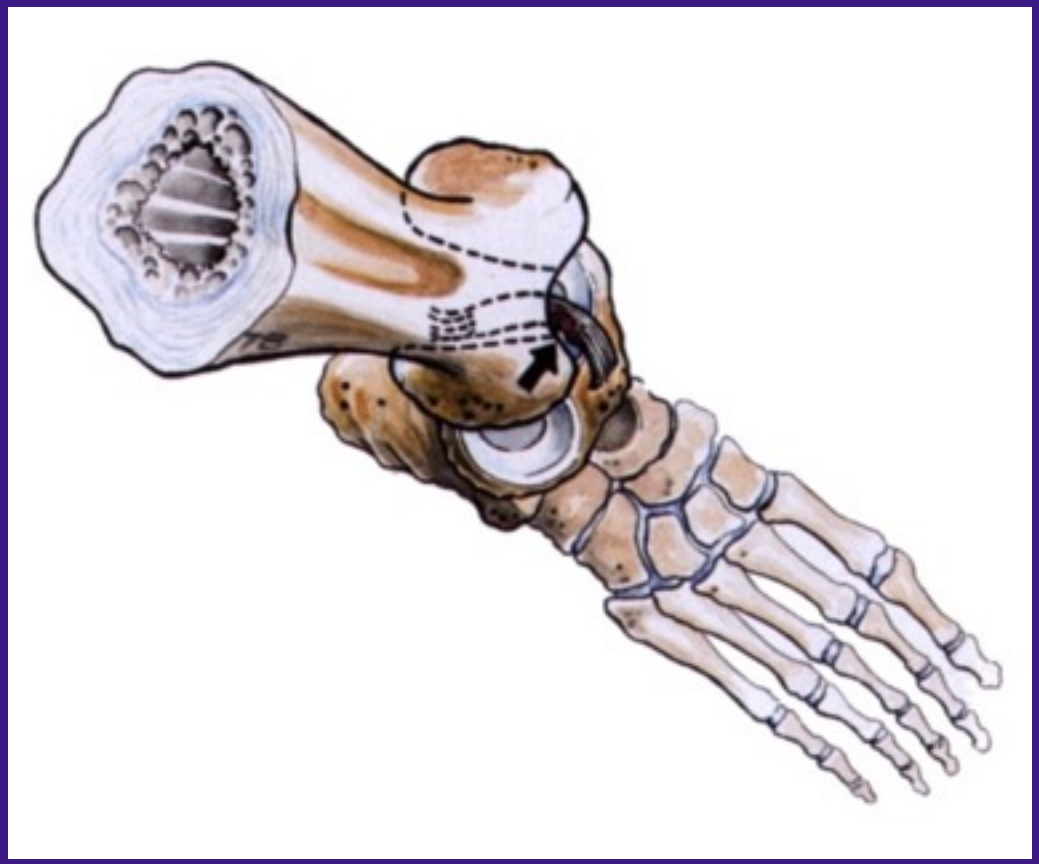


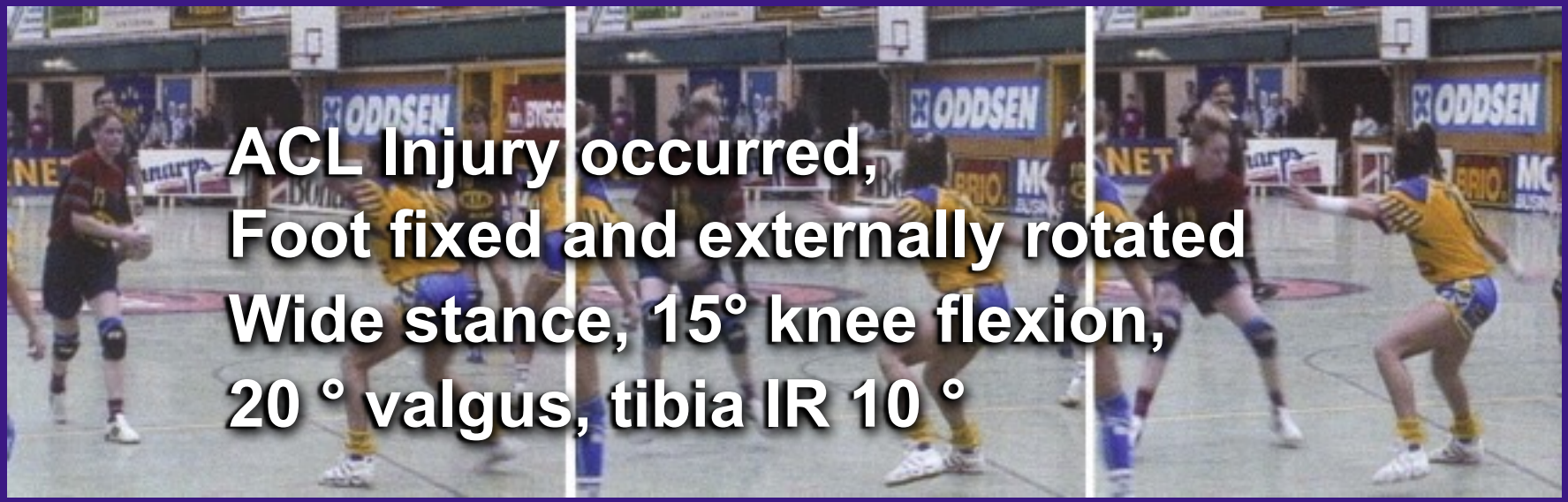
Injury Mechanisms – Body Positions



Team Handball

Olsen OE,
Myklebust G,
Engebretsen L,
and Bahr R,
"Injury Mechanisms for Anterior Cruciate Ligament Injuries in Team Handball: A Systematic Video Analysis,"
in *Am J Sports Med* 32(4); June 2004, 1002-1012.





ACL Injury occurred,
Foot fixed and externally rotated
Wide stance, 15° knee flexion,
20 ° valgus, tibia IR 10 °



ACL injury occurred
Foot fixed and externally rotated, knee 20°, tibia ER 10°, valgus 10°

Off-balance, in the air



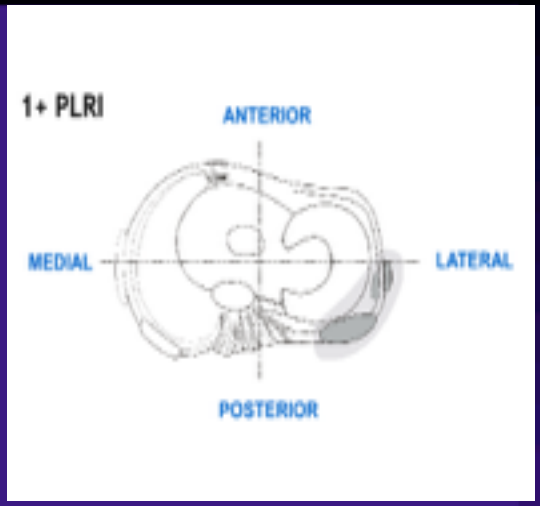
Soccer



Knee Instabilities

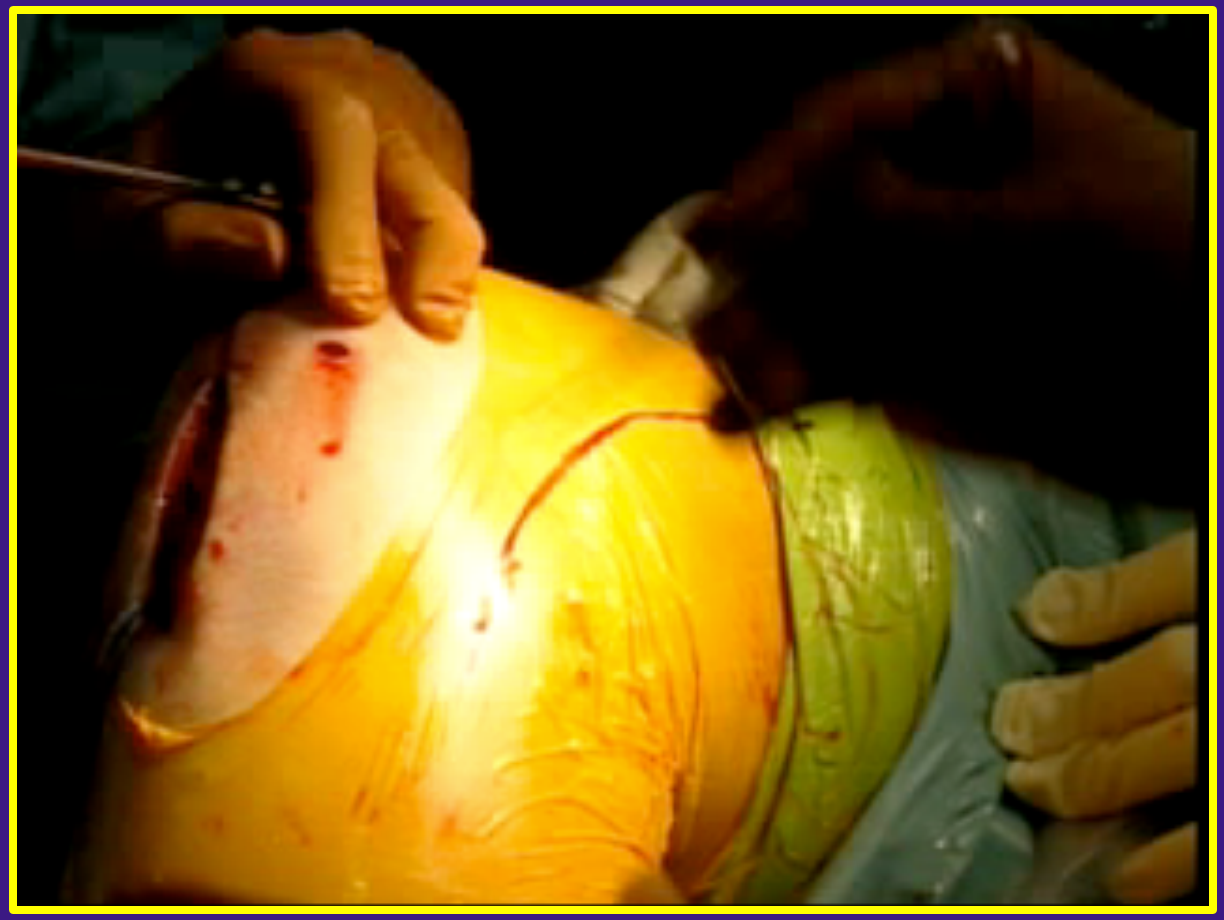
PLRI

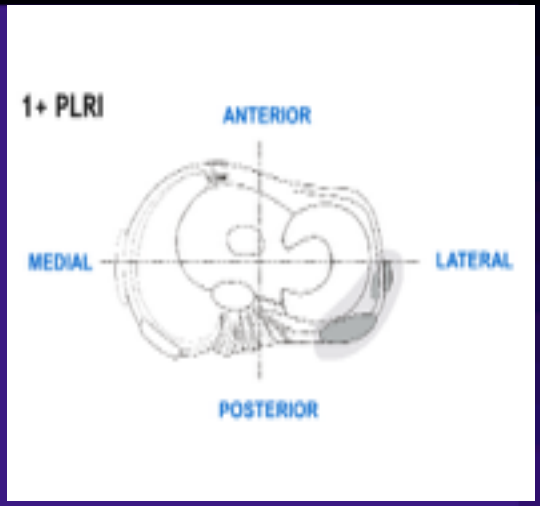




Knee Instabilities

PLRI

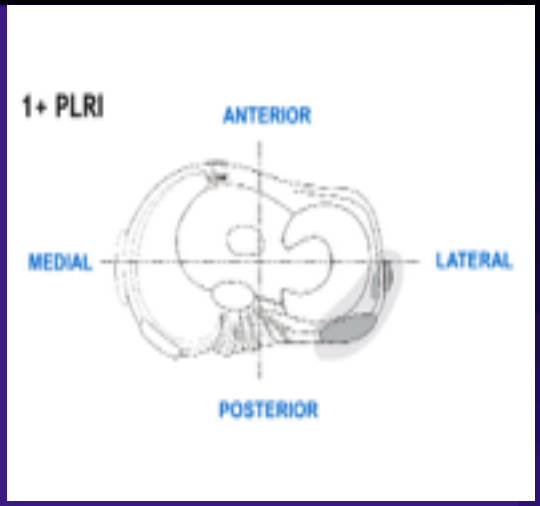


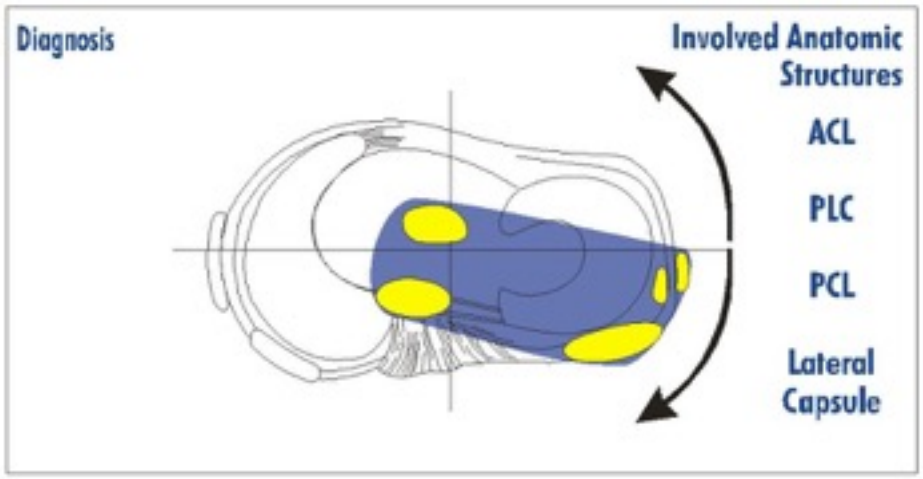


Knee Instabilities

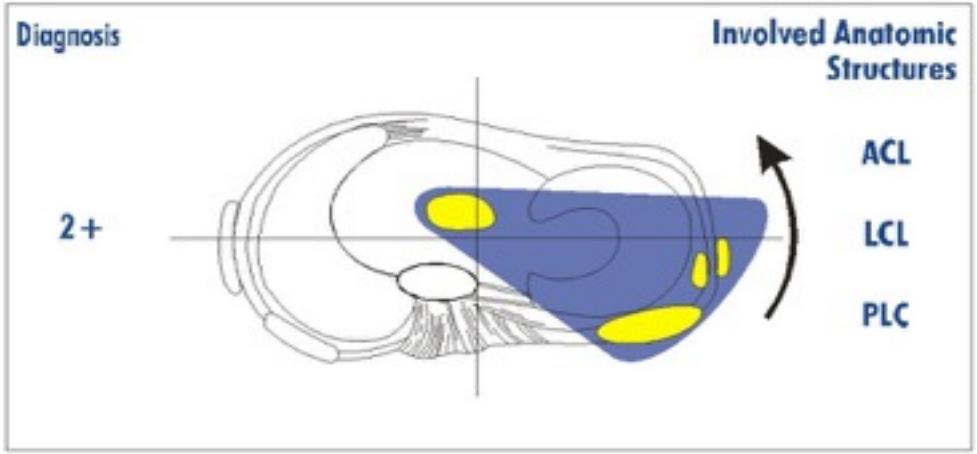
PLRI







Combined ALRI and PLRI



Antero-Lateral Rotatory Instabilities (ALRI)

Sideline Assessment of Injuries



To Make the Diagnosis:

Use observation of mechanism, physical exam skills, and talk to the athlete



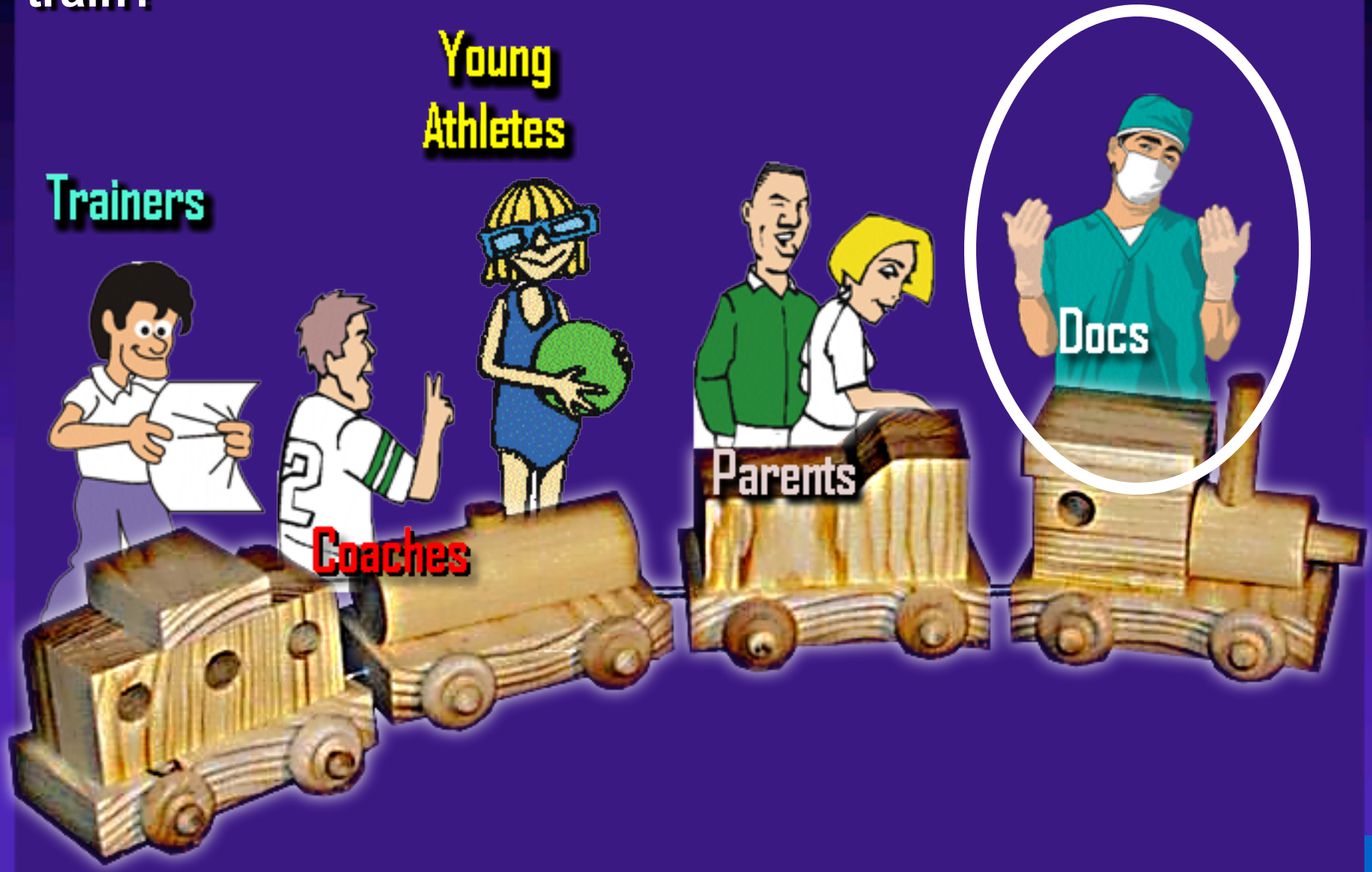


Jerry Rice

Non-contact ACL tear, professional football athlete

Injuries occur at all levels of talent and experience

Who is driving the sideline decision and return to play train?



The End . . . Thank You!

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February 9, 2013