Sports injuries

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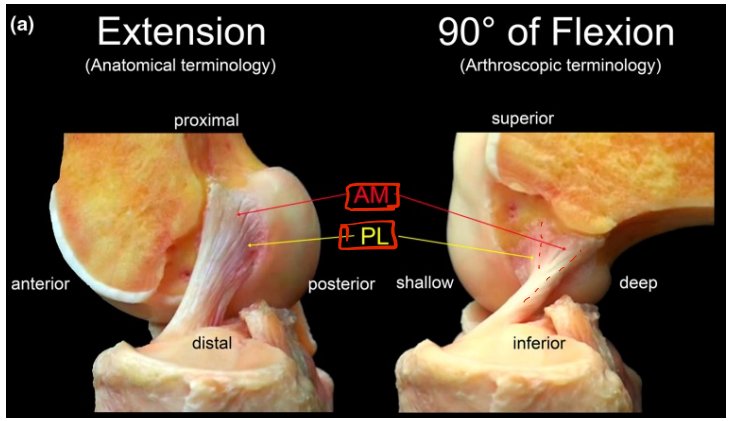
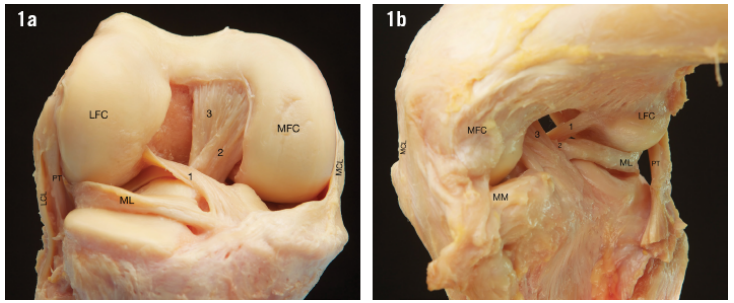
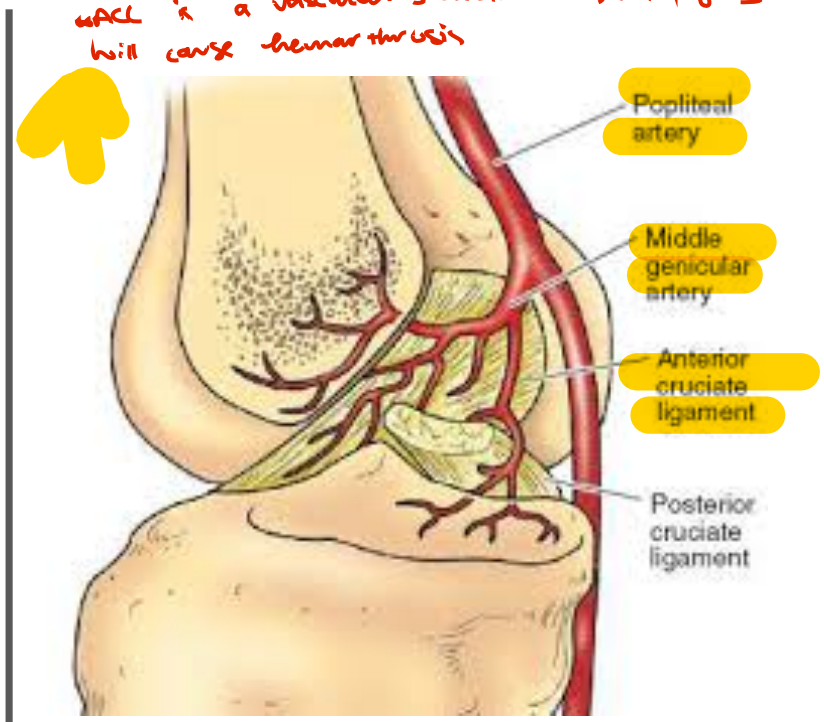
Anterior cruciate ligament Tear

ACL exits from medial side of lateral condyle of femur and continue to the tibia, it is composed of 2 bundles (anteromedial (it has a function in preventing the anterior translation of tibia) and posterolateral bundle (prevents rotation inside the knee joint), those two bundles also imp to prevent varus and valgus







Anatomy

function

stability to prevent anterior translation of the tibia relative to the femur/AM

Secondary restraint to tibial rotation and varus/valgus rotation/PL

Mechanism of injury

non-contact pivoting injury

→ Tibia goes Anteriorly by the effect of Quadriceps, ACL Prevent tibial translocation

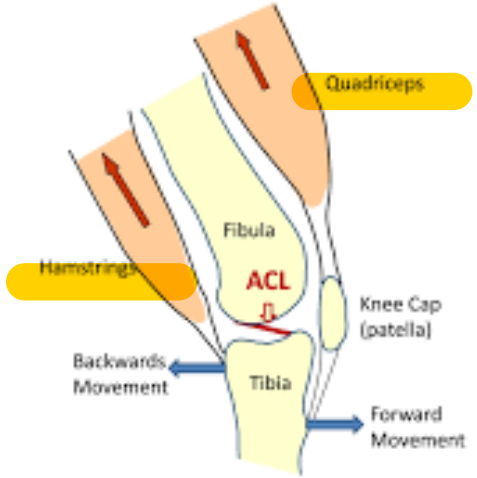
→ Hamstrings pull the tibia posteriorly

(Tibia)

if quadriceps more dominant → Tibia location will go ant, because the hamstring still not functioning → ACL [illegible] → to prevent Ant translation

→most imp cause of ACL injury is neuromuscular incoordination →

Quadriceps dominance



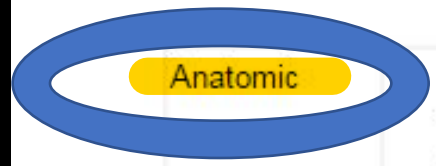
Sex-related differences

ACL injury more common in female athlete (4.5:1 ratio) due to:

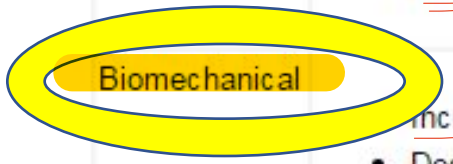
Why?

landing biomechanics and neuromuscular activation patterns (quadriceps dominant) play the biggest role

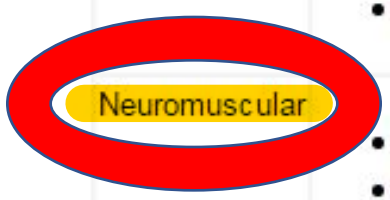
Risk factors



- BMI
- Impingement on intercondylar notch, smaller notch
- Smaller ACL
- Hypermobility/joint laxity
- Previous ACL injury



- Increased knee valgus and extension during landing
- Decreased knee and hip flexion
- Fatigue resistance



- Lower hamstring:quad ratio (more quads dominant)
- Lower hamstring recruitment
- Weaker core stability

- Preovulatory phase of menses (hormones affect coordination)
- Females on OCP not as affected during this phase

Genetic

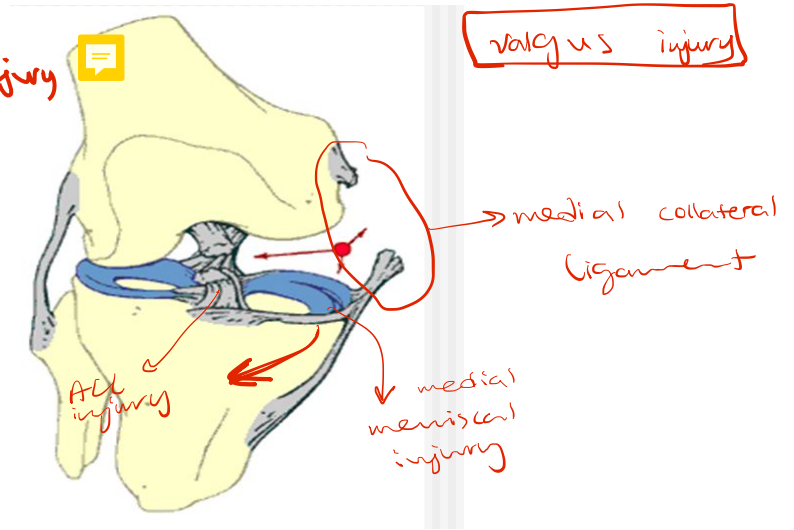
- Collagen production (COL5A1 gene linked to decreased risk of injury in women)

Associated injuries

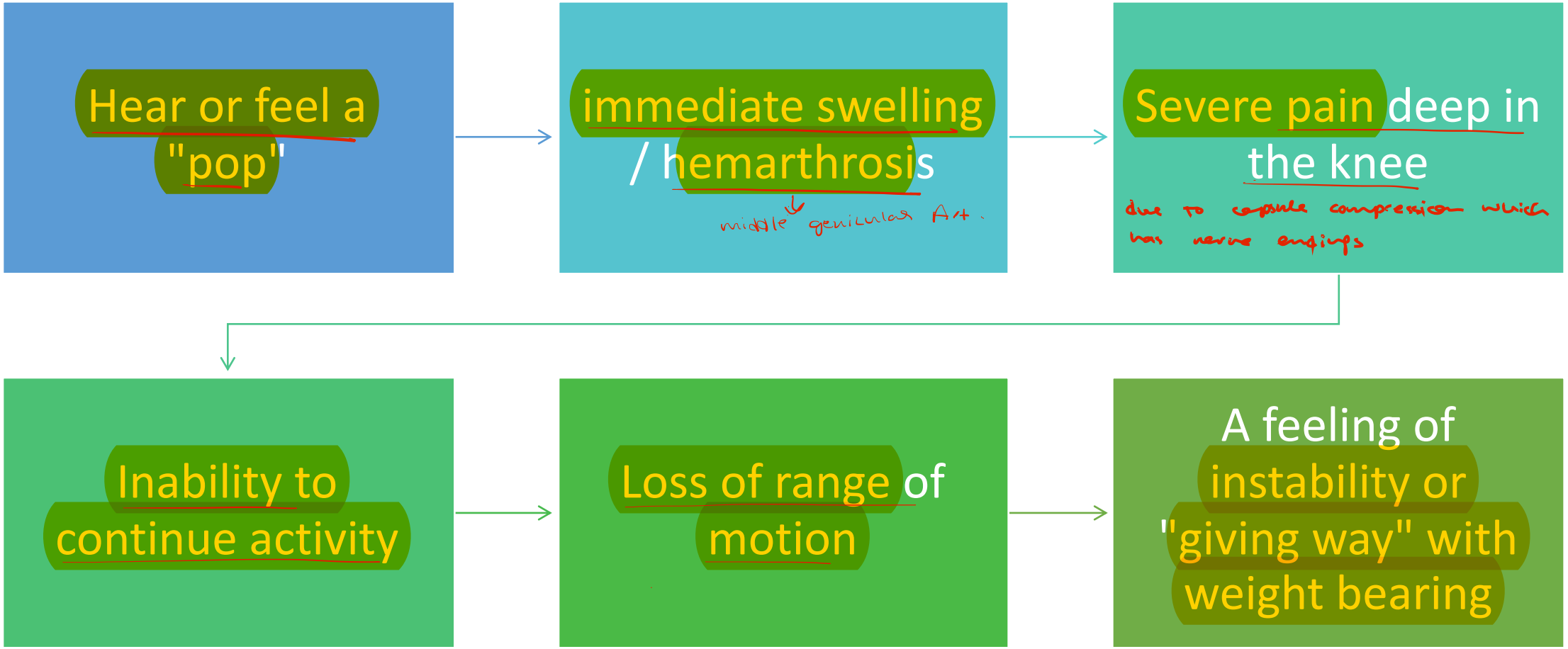
- Meniscal tear…lateral > medial or medial > lateral
- Chondral injuries
- Unhappy triad

ACL
MCL
MMT

→ Acutely → lateral meniscal injury
→ Chronically → Medial " "



Symptoms


Hear or feel a "pop"
immediate swelling / hemarthrosis
middle genicular Art.
Severe pain deep in the knee
due to capsule compression which has nerve endings
Inability to continue activity
Loss of range of motion
A feeling of instability or "giving way" with weight bearing

Physical exam

effusion

quadricep avoidance gait → Tibia will go anteriorly

Anterior Drawer test

Lachman's test (most sensitive exam test)

Pivot shift

valgus stress on full extension then flexion.

Lachman's test

Anterior Drawer

Pivot shift

Avoidance Gait

Imaging

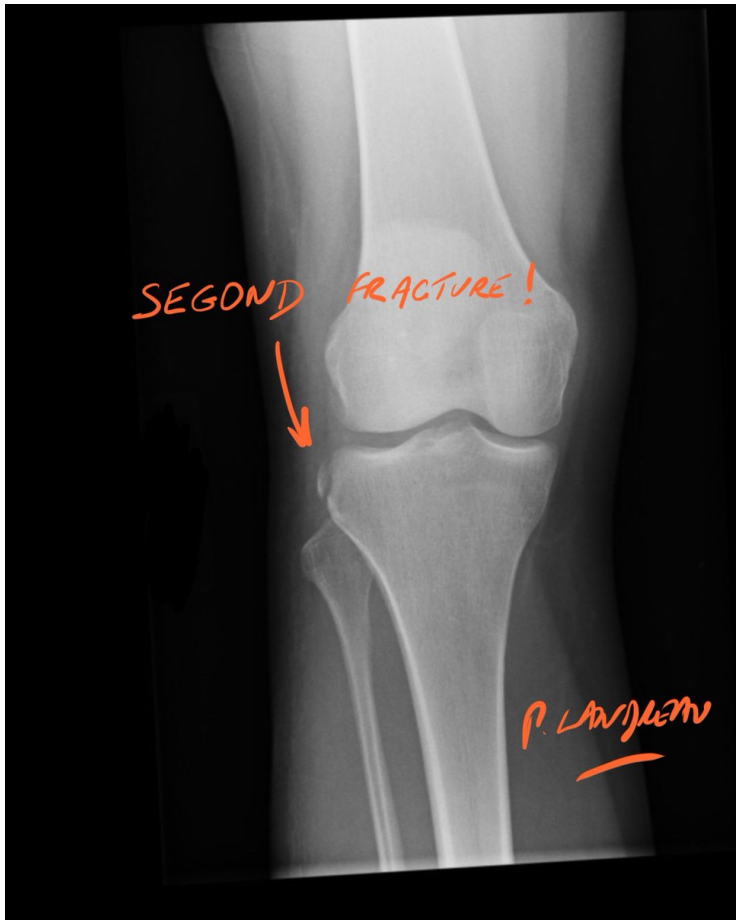
Radiographs

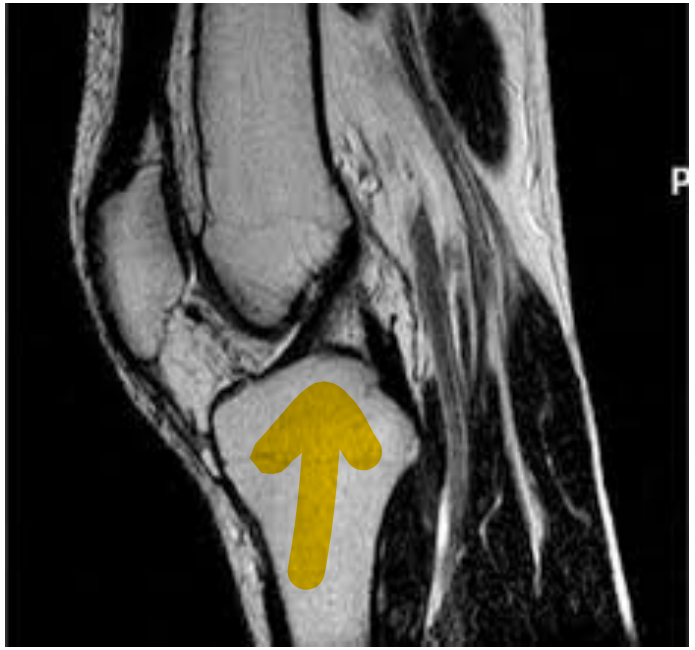
- usually normal
- Segond fracture

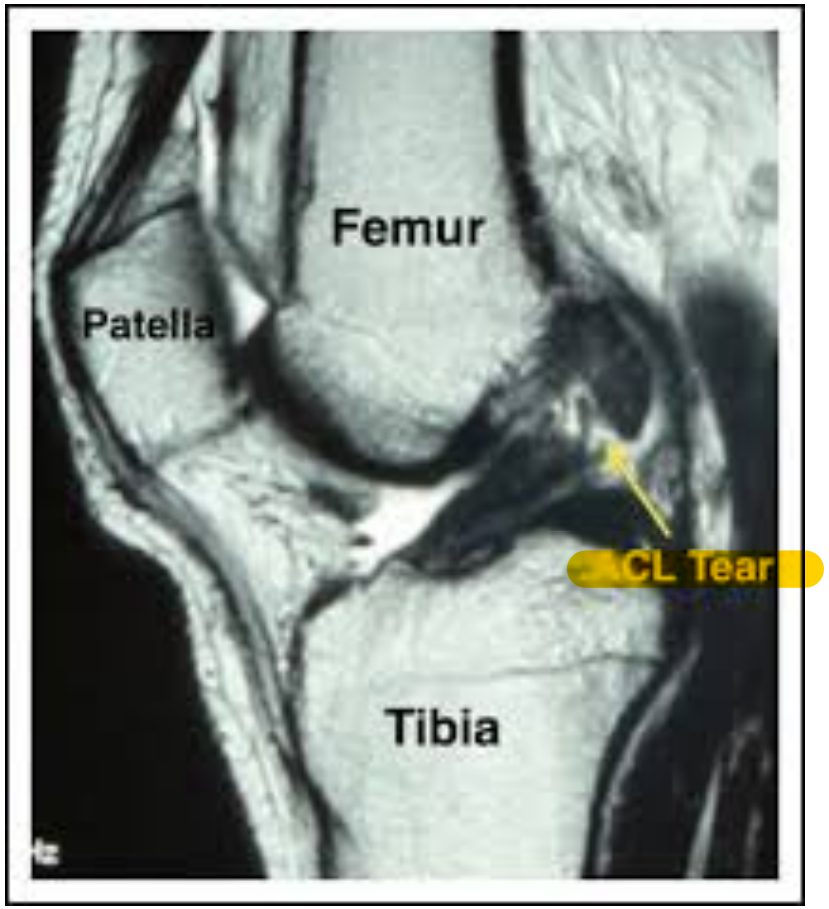
MRI

- discontinuity of fibers
- bone bruising

Segond Fracture → 95% ACL injury.

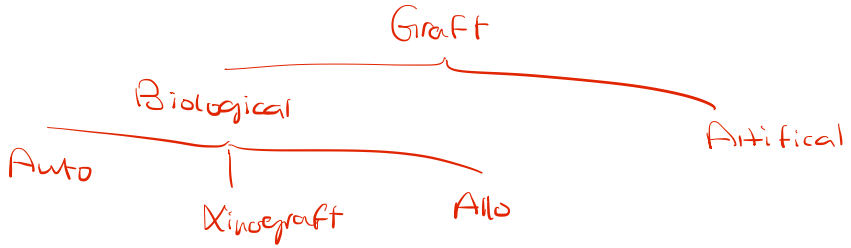


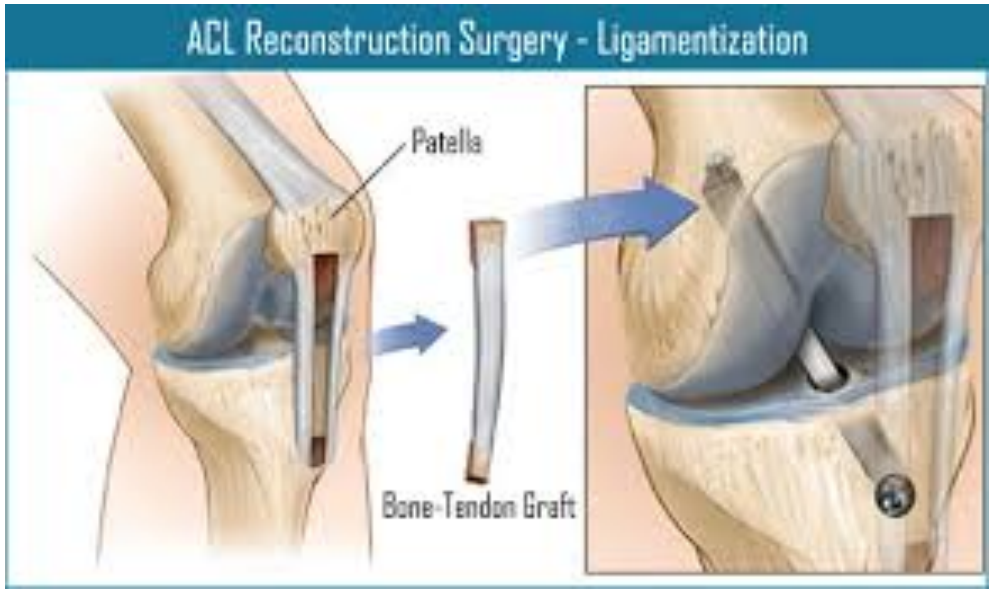




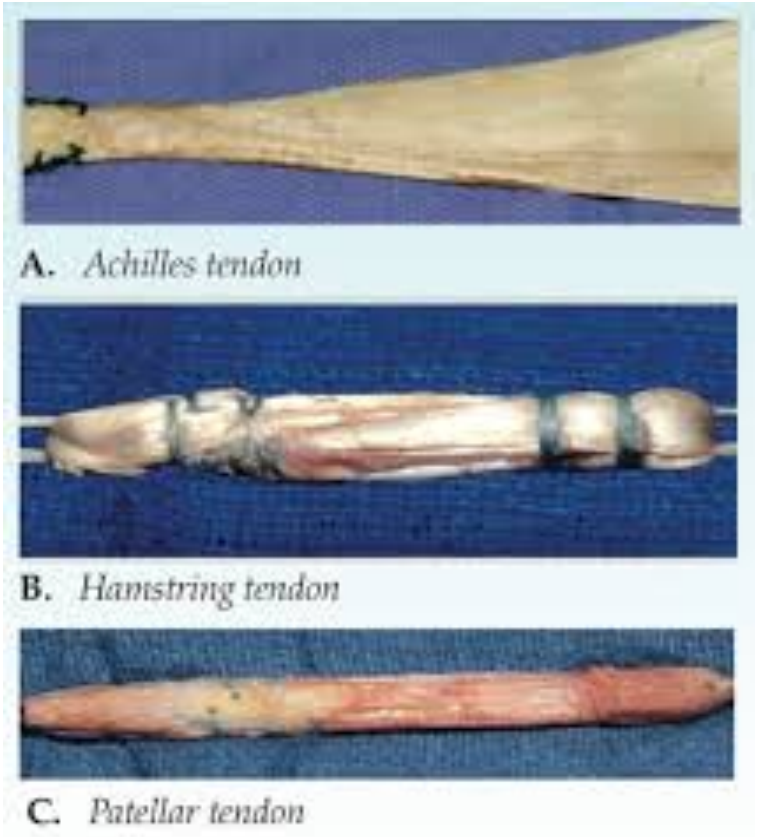
Treatment

- Nonoperative
  - physical therapy, lifestyle modifications, Analgesia
- Operative
  - ACL reconstruction (graft replaces injured ACL)





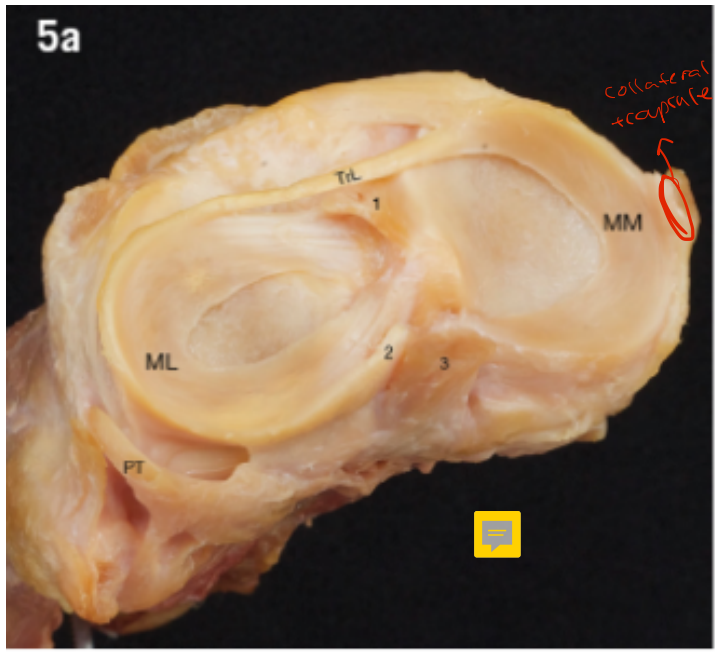
Patellar tendon Graft → Auto graft

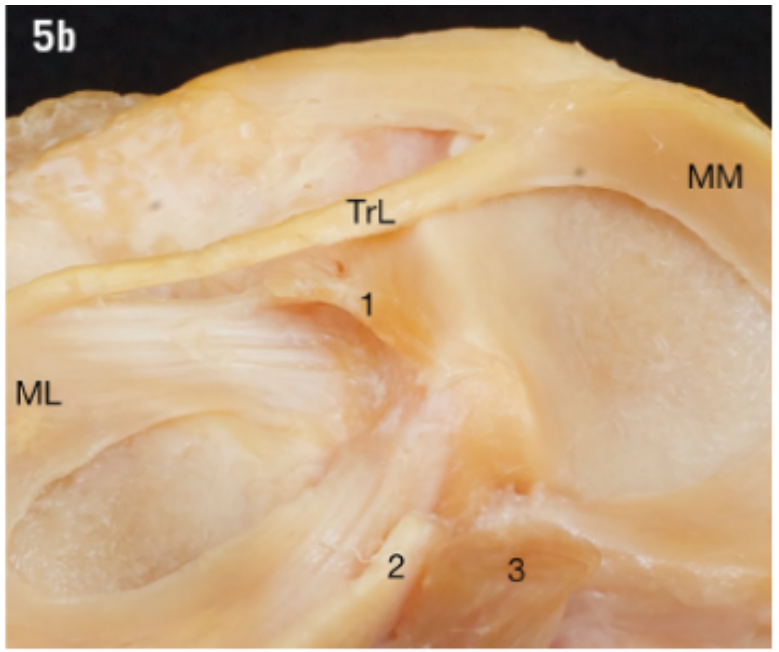


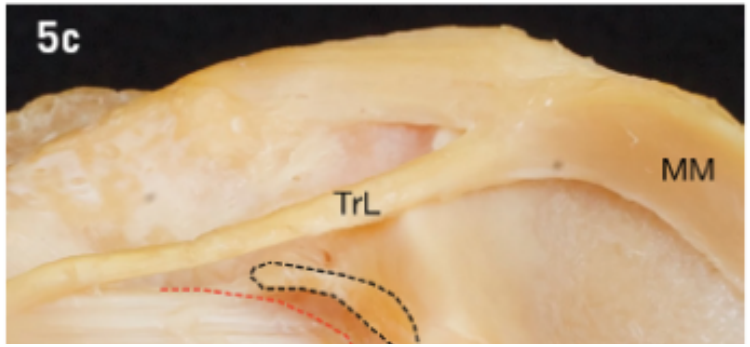
A. *Achilles tendon*

B. *Hamstring tendon*

C. *Patellar tendon*





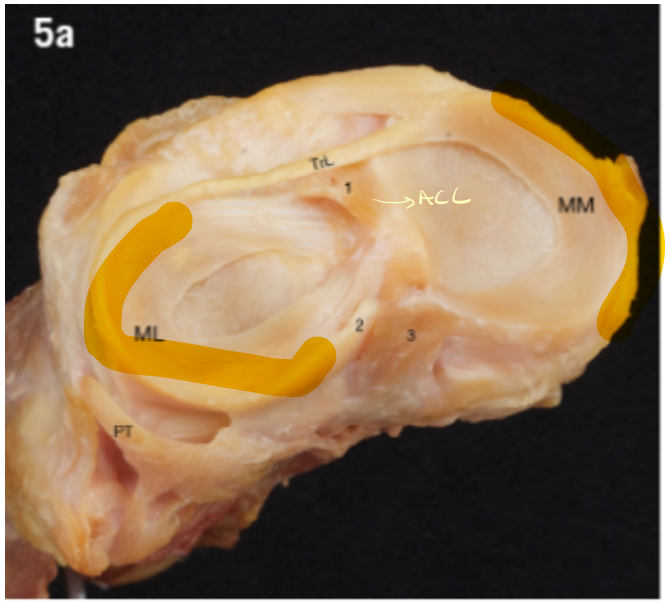


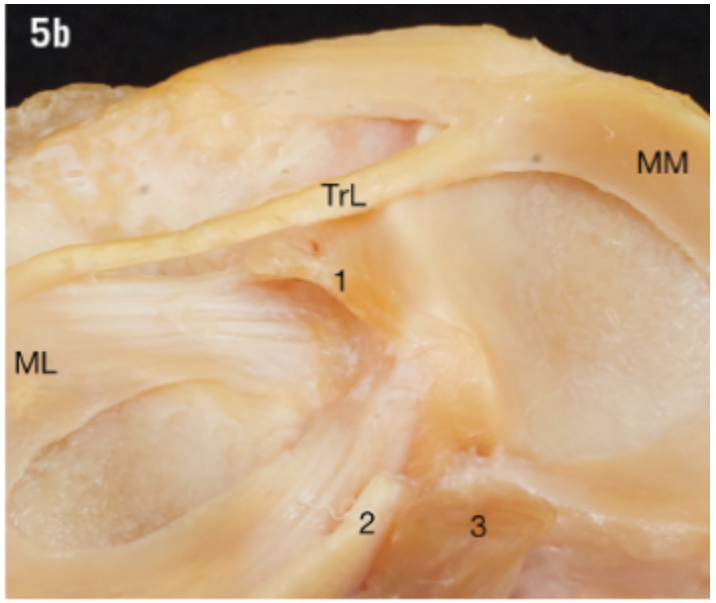
Meniscal injures

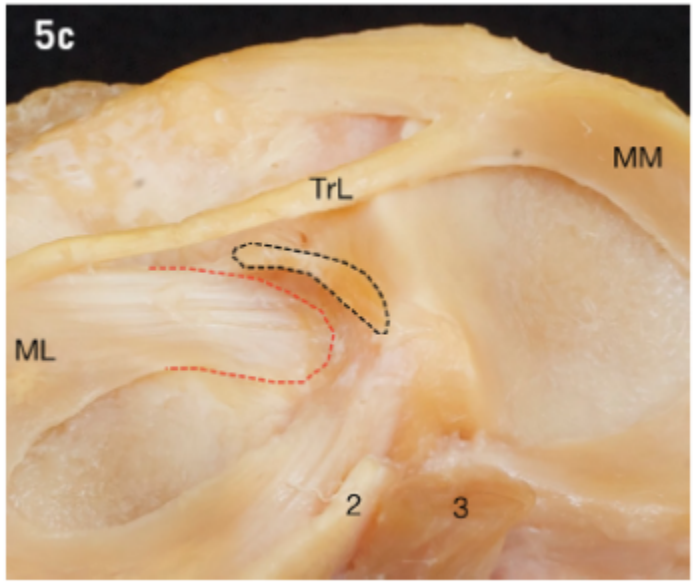
Anatomy

- MM>LM → لذلك أكثر إصابة MM
- bimodal
  - Youngers → Traumatic
  - Old ages → degenerative

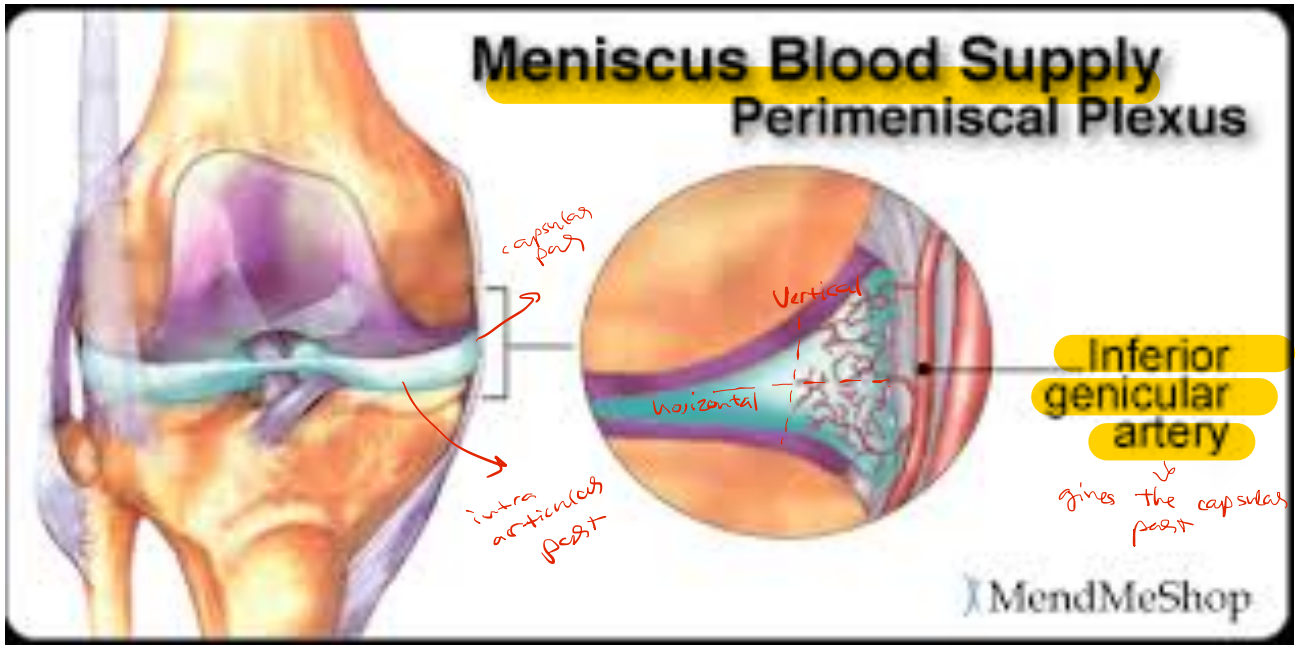
→ Except in acute ACL injury → Lateral meniscus > MM



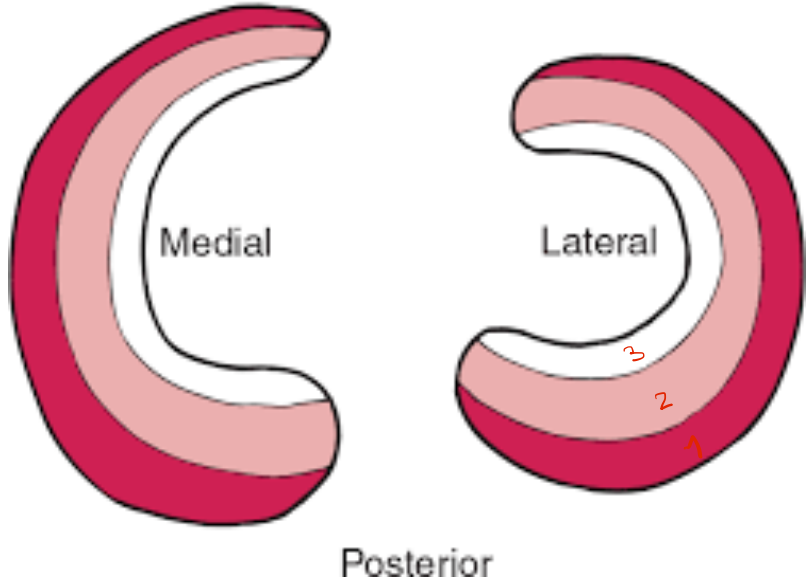




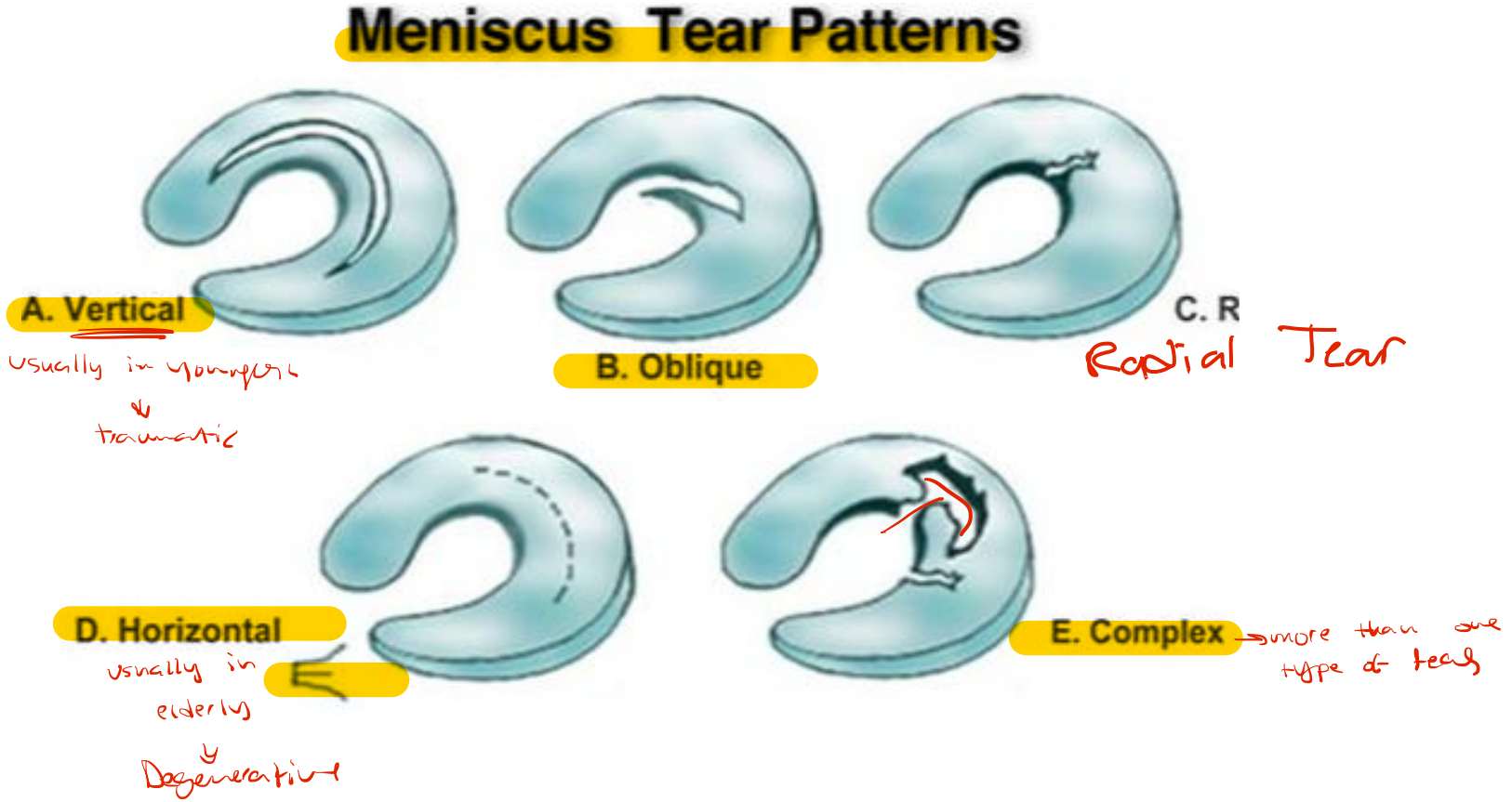
Blood supply



1: red-red zone → Capsular : Vascular
2: red-white zone → partially vascular
3: white-white zone



Classification



Usually in youngers
↓
traumatic

Radial Tear

usually in elderly
↓
Degenerative

more than one type of tears

هاد vertical tear بس صار طبقة بيجي انه الجزء ال intra-articular

هاد عمل Flap وعمل locking

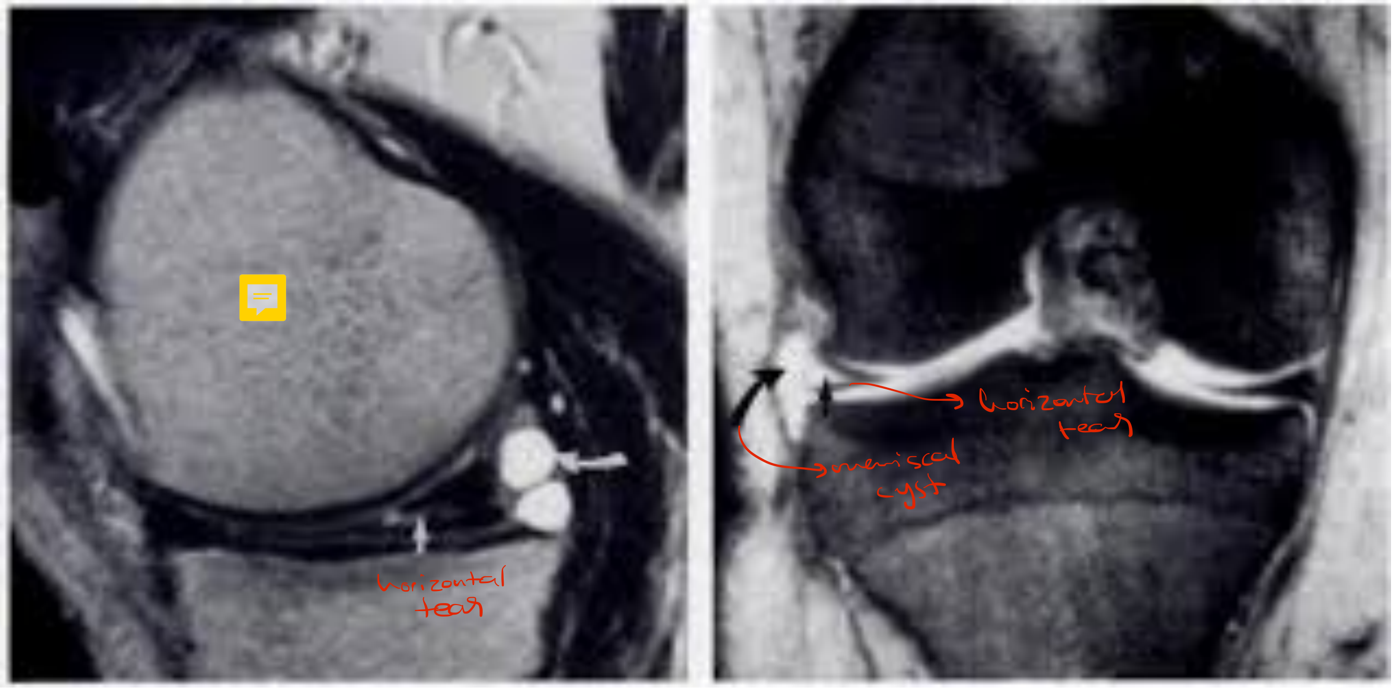
Bucket handle tear is vertical tear

locking

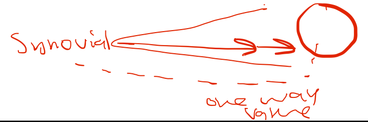
إزا عمل ال tear جوا ← ، بيصير يدخل ال synovial
ويكون cyst

Horizontal Tear → Degenerative

Meniscal Cyst is Horizontal tear



Meniscal cyst
↓
one way valve



Symptoms

pain on medial (MMT) or lateral (LMT) side

mechanical symptoms (locking and clicking)

especially bucket handle

delayed swelling

mostly effusion not blood, unlike ACL where there is immediate hemarthrosis

Physical exam

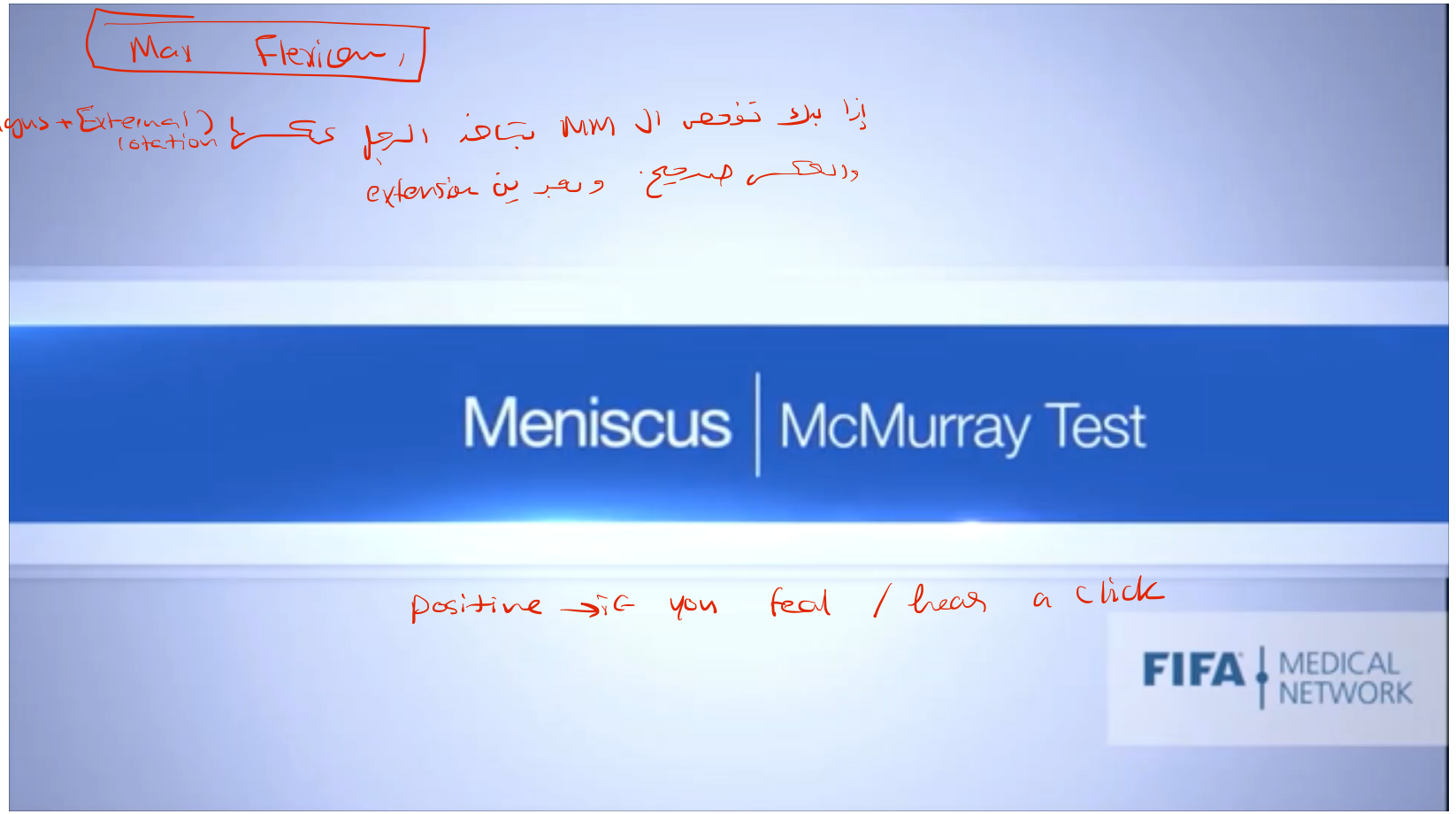
joint line tenderness (most sensitive physical examination finding)

MM → Medial Joint line
& vice versa

Effusion

Limited ROM if there is locking

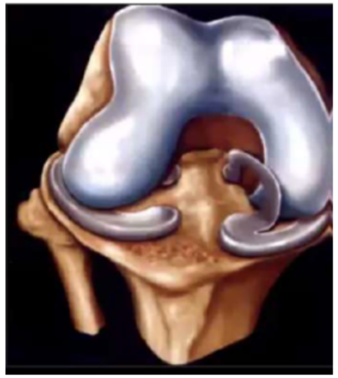
McMurray's test

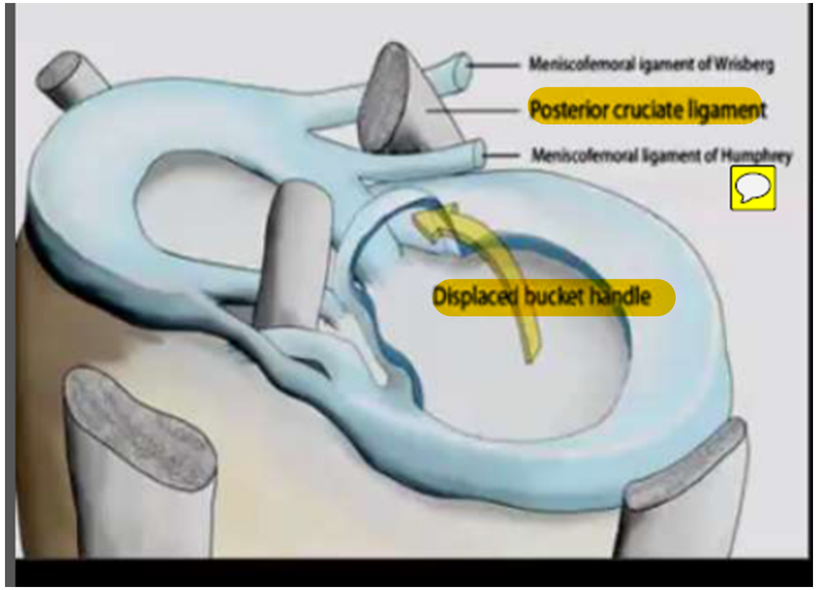

Max Flexion
(valgus + External rotation)
إذا بدك تفحص الـ MM بتاخد الرجل عكسع
والكعب صحيح وبعد بين extension
Meniscus | McMurray Test
positive → if you feel / hear a click
FIFA | MEDICAL NETWORK

Imaging

Radiographs	• Normal
MRI	• most sensitive diagnostic test, but also has a high false positive rate

Vertical, Bucket handle





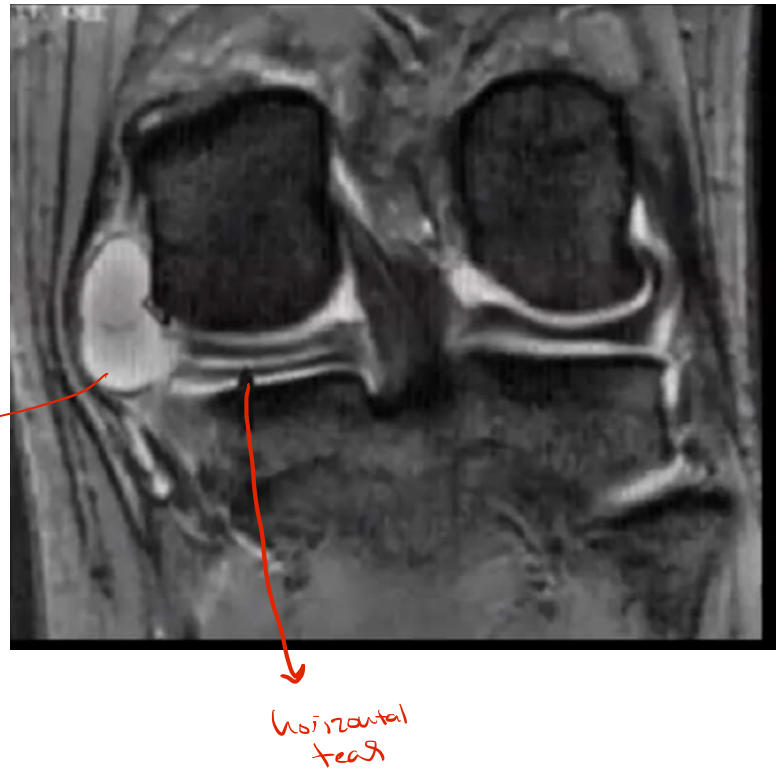
Double PCL sign on MRI

↓

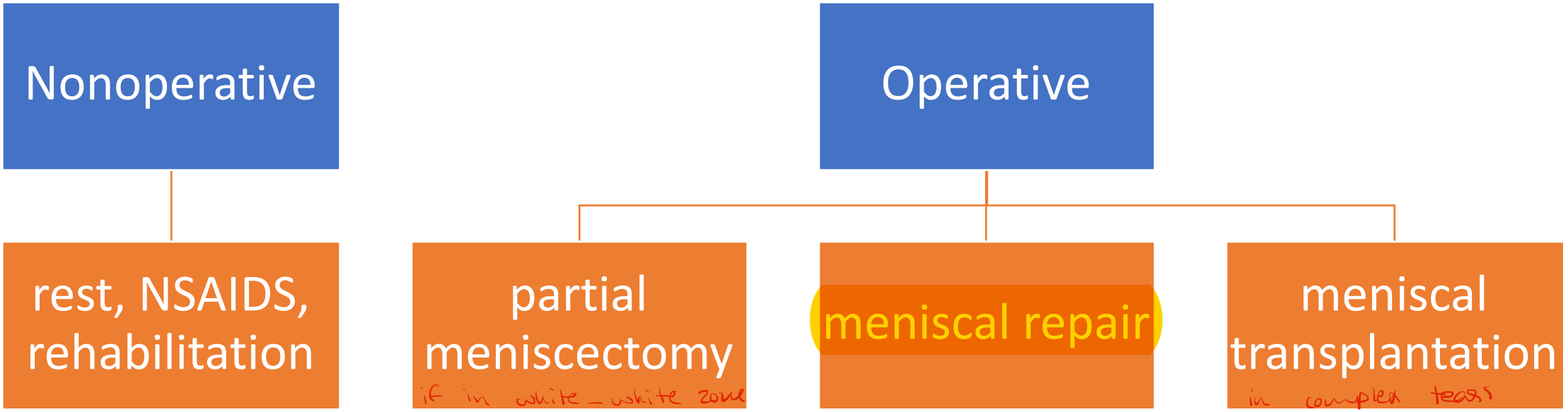
لما أشوفه بحكي انه في

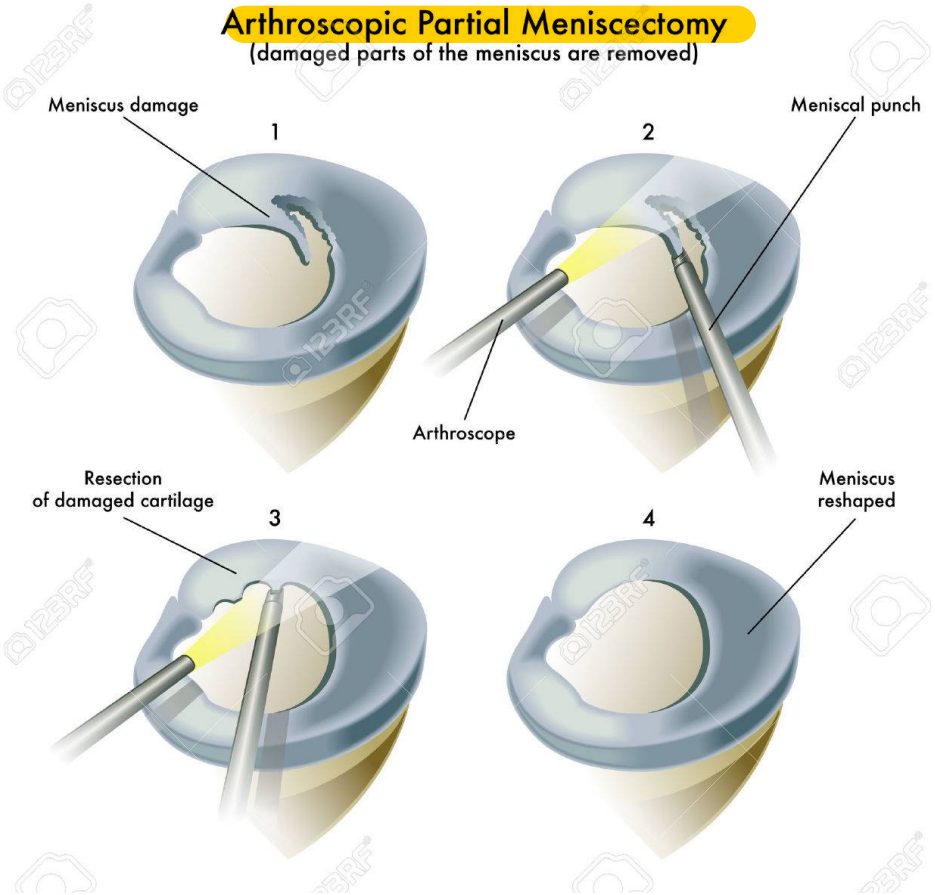
Bucket handle tear

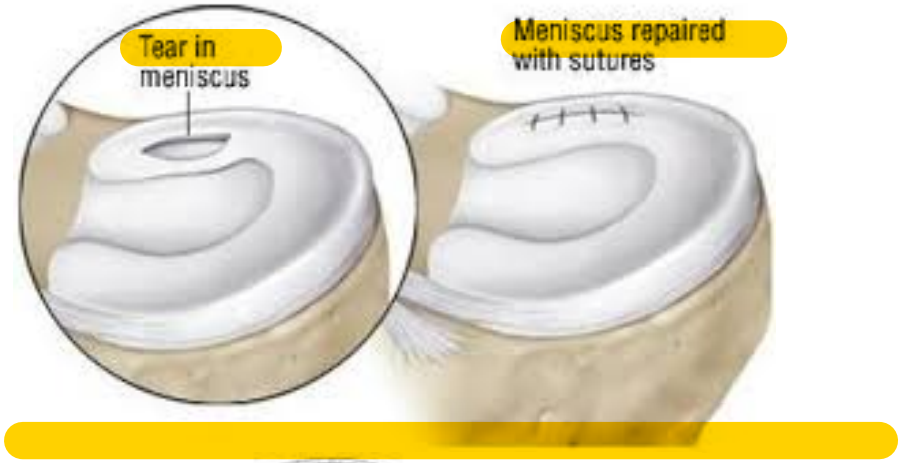

horizontal tear


cyst
horizontal tear

Treatment


Nonoperative
Operative
rest, NSAIDS, rehabilitation
partial meniscectomy
if in white – white zone
meniscal repair
meniscal transplantation
in complex tears


Arthroscopic Partial Meniscectomy
(damaged parts of the meniscus are removed)
Meniscus damage
1
2
Meniscal punch
Arthroscope
Resection
of damaged cartilage
3
4
Meniscus
reshaped


Tear in
meniscus
Meniscus repaired
with sutures