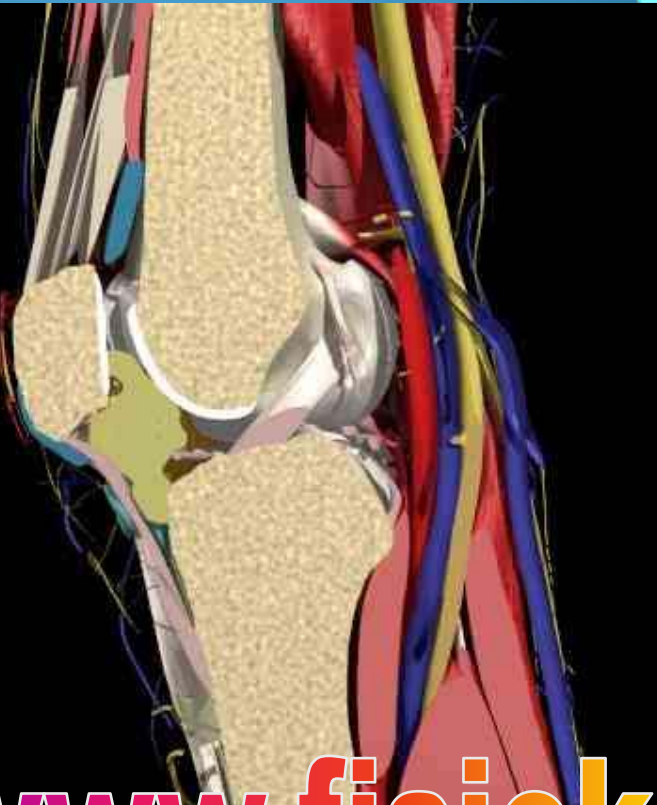


# Anterior Cruciate Ligament Injury



[www.fisiokinesiterapia.biz](http://www.fisiokinesiterapia.biz)

# Case

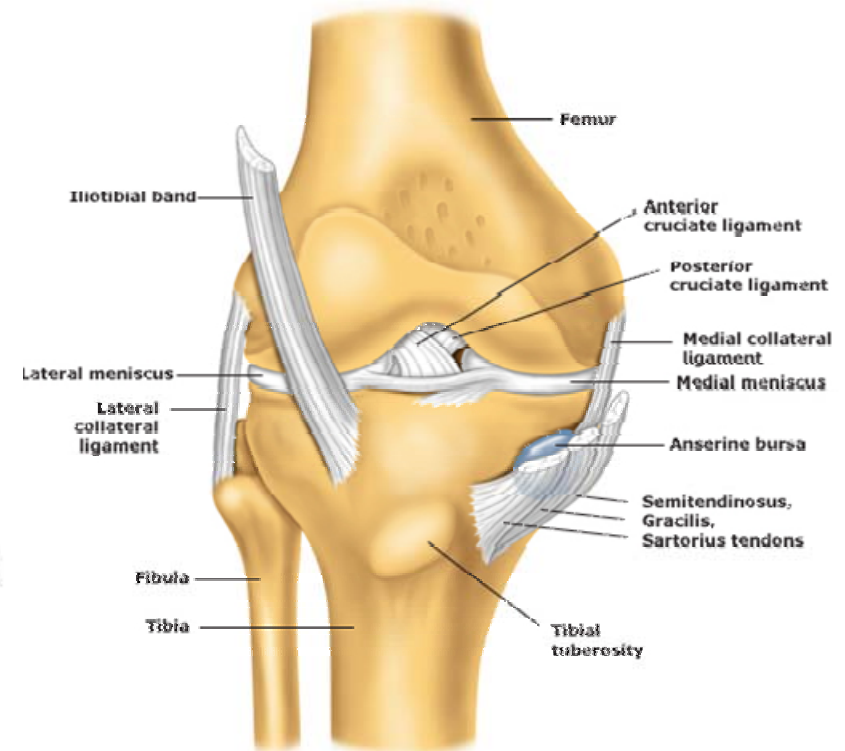
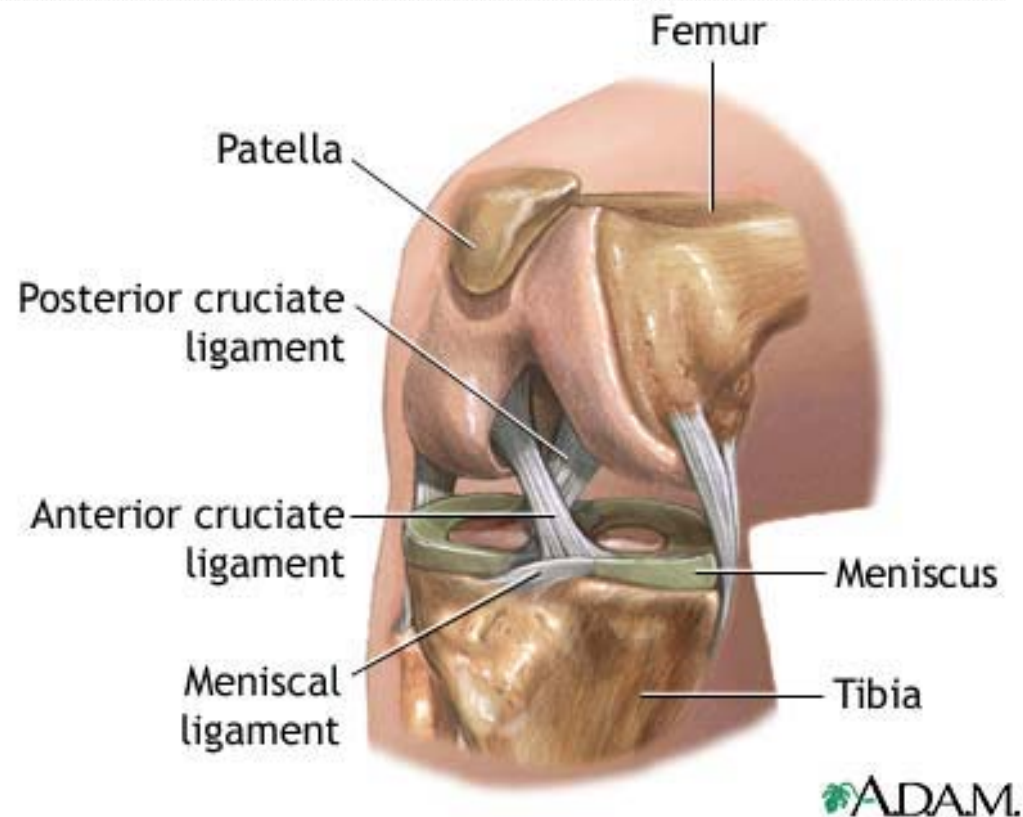
- 31yo M who sustained an injury to L knee while playing Basketball approximately 2 weeks ago. He describes pivoting and hyperextending his knee, which swelled over the next few days. He now presents to clinic with pain on pivoting.
- L Knee PE on presentation:
  - 2+ L knee effusion.
  - Skin intact.
  - Active range of motion 0-120 degrees.
  - Increased pain with flexion past 120 degrees.
  - Severe tenderness to palpation over medial joint line down to posterior horn of medial meniscus.
  - Stable to varus and valgus stress, with pain on varus stress localized over medial meniscus.
  - Lachman negative – inadequate test because of significant patient guarding.
  - Posterior drawer negative.
  - Positive McMurray.
  - Positive Apley.
  - Soft and compressible L calf compartment.
  - Normal toe flexion and extension.
- Rest of PE WNL.

# Differential Diagnosis

- Ligament injury:
  - Knee dislocation
    - Cruciate injury
    - Collateral injury
- Meniscal injury
- Patellar injury
- Fracture



# Normal Knee Anatomy

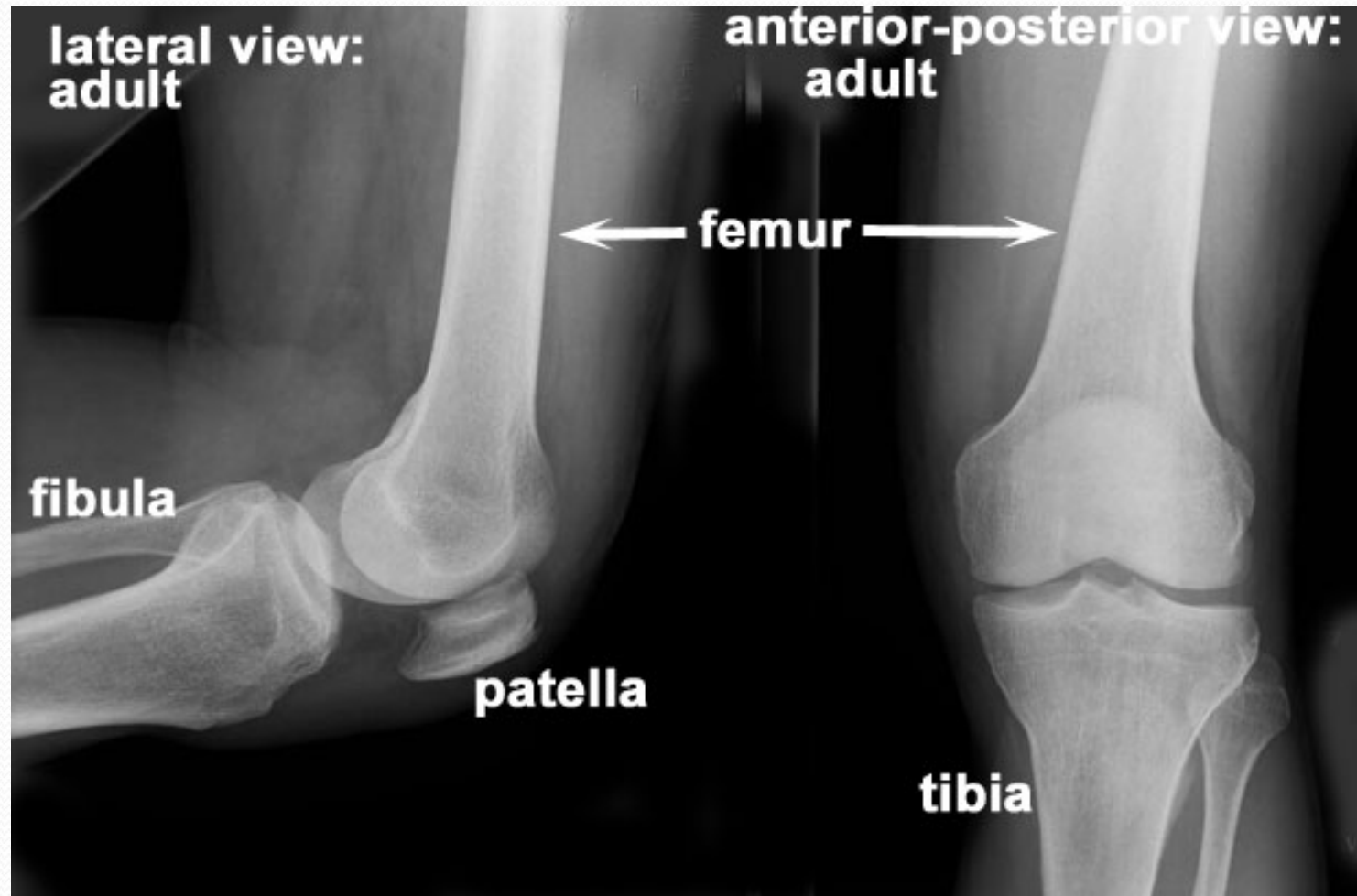


# Normal ACL Function



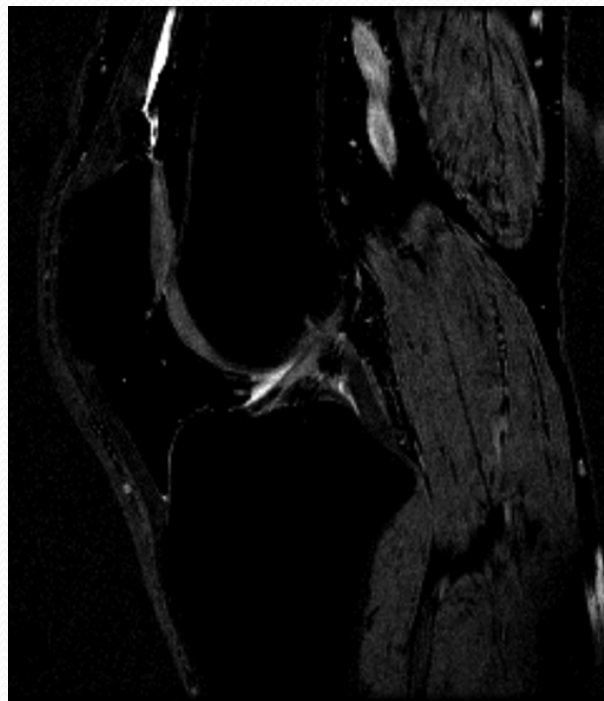
Primal Pictures

# Normal Knee Plain Films



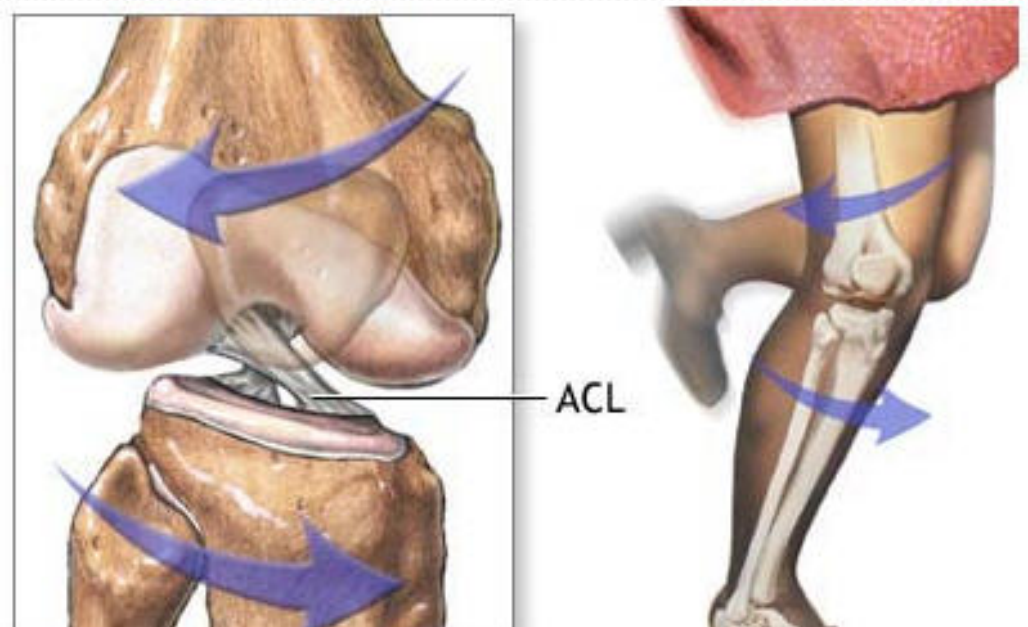


# Normal Knee MRI



# Typical ACL Injury

- Non-contact injury occurs in 70% of cases.
  - Running or jumping with sudden deceleration and direction change, or pivoting while rotating or lateral bending (valgus stress).
- Contact injury
  - Lateral blow leading to hyperextension or lateral stress while foot is planted.





# In pictures...



## **Culprit sports:**

Alpine skiing  
American football  
Rugby  
Basketball  
Soccer  
Gymnastics  
Tennis.





Closer look...



# Classical Plain Film Findings

- Second Fracture: avulsion fracture of anterolateral tibial plateau at the site of attachment of the lateral capsular ligament.
- Avulsion fractures from femoral or tibial ACL attachments.





# Continued...

- Deep Sulcus Sign: Lateral femoral condylar sulcus  $> 1.5\text{mm}$
- Anterior translation of tibia (not shown).



# Classic MRI Findings

- Irregular/wavy ACL contour with decreased angulation.
- Widespread increased signal intensity on the region of ACL (all sequences).
- Posterior displacement of lateral meniscus.
- Loss of normal curvature with increased angulation of PCL.
- Undulation of patellar tendon.
- Medullary osseous contusions of posterolateral tibial plateau and



Back to our case...





# Radiologic Results

- Plain Films

- Moderate joint effusion.
- ?Deep sulcus sign.

- MRI

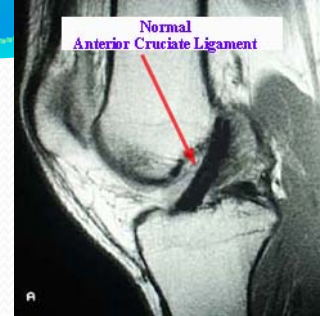
- Acute full thickness L knee midsubstance ACL tear w/ moderate joint effusion and bone contusions in lateral femoral condyle and lateral tibial plateau.
- Medial meniscocapsular injury with medial tibial plateau edema.
- Posterolateral soft tissue and posterior capsule edema suggesting sprain.

# Case Plain Films



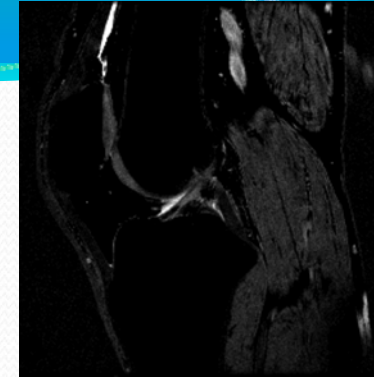


# Case MRI – T1





# Case MRI - T2





# 10-Day Follow-Up...

- Patient returned with increased ability to bear weight and reduced pain.
- Repeat L knee PE:
  - Markedly diminished effusion.
  - Positive anterior draw and Lachman (no guarding).
  - Persistent tenderness over lateral femoral condyle.
  - Calf is soft and non-tender.
  - Good motion from 0 to 130 degrees.
- Patient referred to Orthopedic Sports for assessment by knee specialist (surgery vs. non-surgical management)