

# Collateral Ligament Injuries of the Knee

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# Financial Disclosure

▶ John R Green III, MD has the following disclosures:

▶ **Financial or material support from a company or supplier**

- ▶ Smith & Nephew unrestricted educational grant
- ▶ Arthrex restricted educational grant

▶ **Board member/committee appointments for a society**

- ▶ AAOS
- ▶ American Orthopaedic Society for Sports Medicine
- ▶ Arthroscopy Association of North America

▶ None are relevant to this presentation.



# Learning Objectives

1. Identify the mechanism of injury and anatomy of medial and lateral sided knee injuries
2. Review the importance of identifying a knee dislocation
3. Understand the treatment goals



# Collateral Ligament Injuries of the Knee

Introduction

MCL and LCL (Posterolateral Corner)

Anatomy

Mechanism of injury

Diagnosis

Treatment

Priorities

Is this a knee dislocation?



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# MCL

## ▶ Medial Collateral Ligament

### ▶ Anatomy

#### ▶ Superficial 1.5cm x 11cm

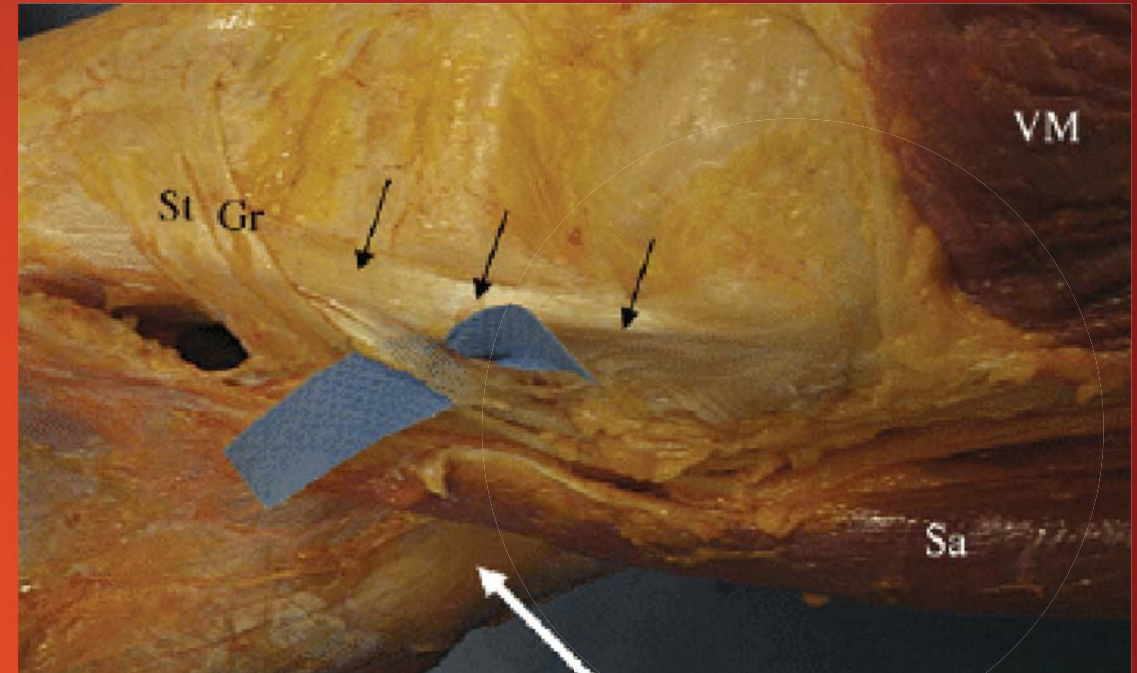
- ▶ Main structural component
- ▶ Medial epicondyle to 7cm down medial tibia

#### ▶ Deep

- ▶ Short capsular component attaches to medial meniscus

#### ▶ Posterior Oblique

- ▶ Forms the posteromedial capsule along the posterior of MCL
- ▶ Adductor tubercle to posteromedial tibia, posterior capsule and semimembranosis



# MCL

- ▶ Medial Collateral Ligament

- ▶ Anatomy

- ▶ Function

- ▶ Limits valgus

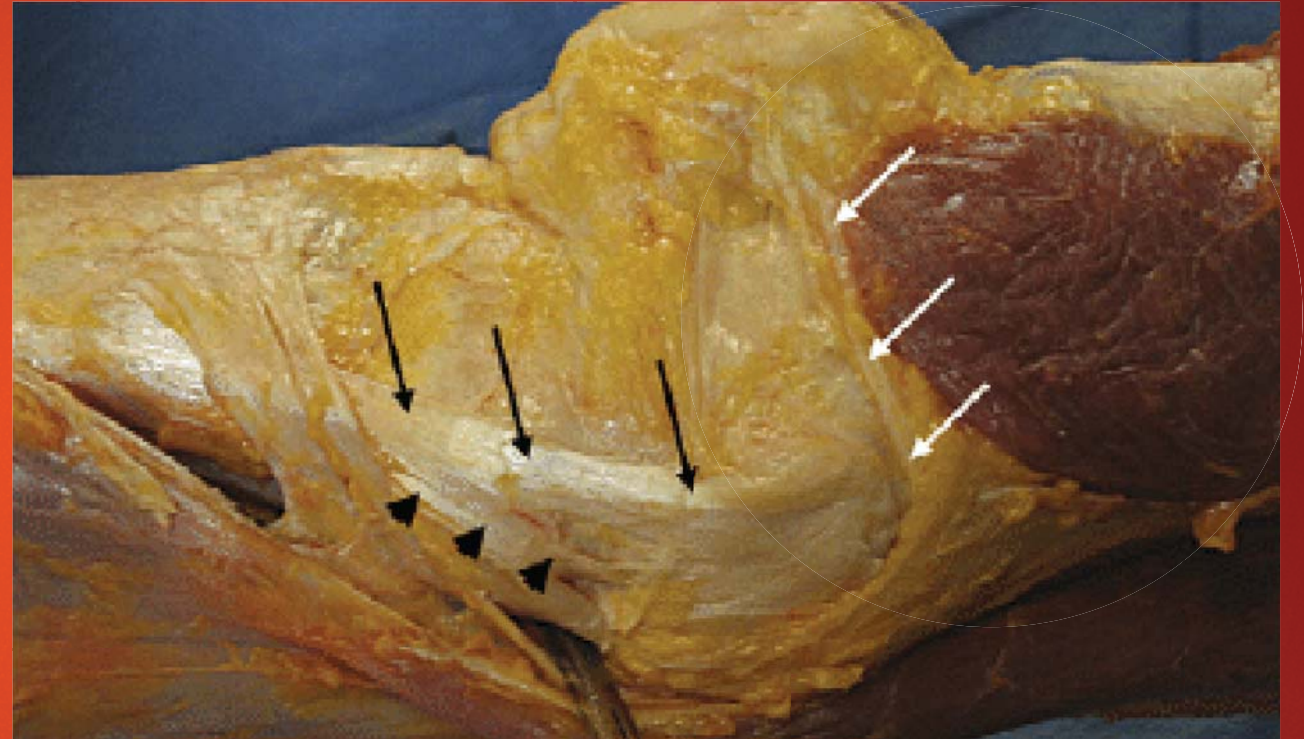
- ▶ Limits external rotation (AMRI)

- ▶ Dynamic stabilizers

- ▶ Semimembranosus

- ▶ Quadriceps

- ▶ Pes anserine (Sartorius, Semitendinosus, Gracilis)



# MCL

- ▶ Medial Collateral Ligament
  - ▶ Anatomy
  - ▶ Function
  - ▶ Mechanism of injury
    - ▶ Valgus with the knee in flexion
      - ▶ Most frequently contact injuries
  - ▶ Even with complete tears 2/3 can ambulate



# MCL

- ▶ Medial Collateral Ligament
  - ▶ Anatomy
  - ▶ Function
  - ▶ Mechanism of injury
  - ▶ Other injuries with the same mechanism
    - ▶ ACL tear
    - ▶ Patella dislocation





# MCL

- ▶ Medial Collateral Ligament

- ▶ Anatomy

- ▶ Function

- ▶ Mechanism of injury

- ▶ Other injuries with the same mechanism

- ▶ Diagnosis (clinical exam)

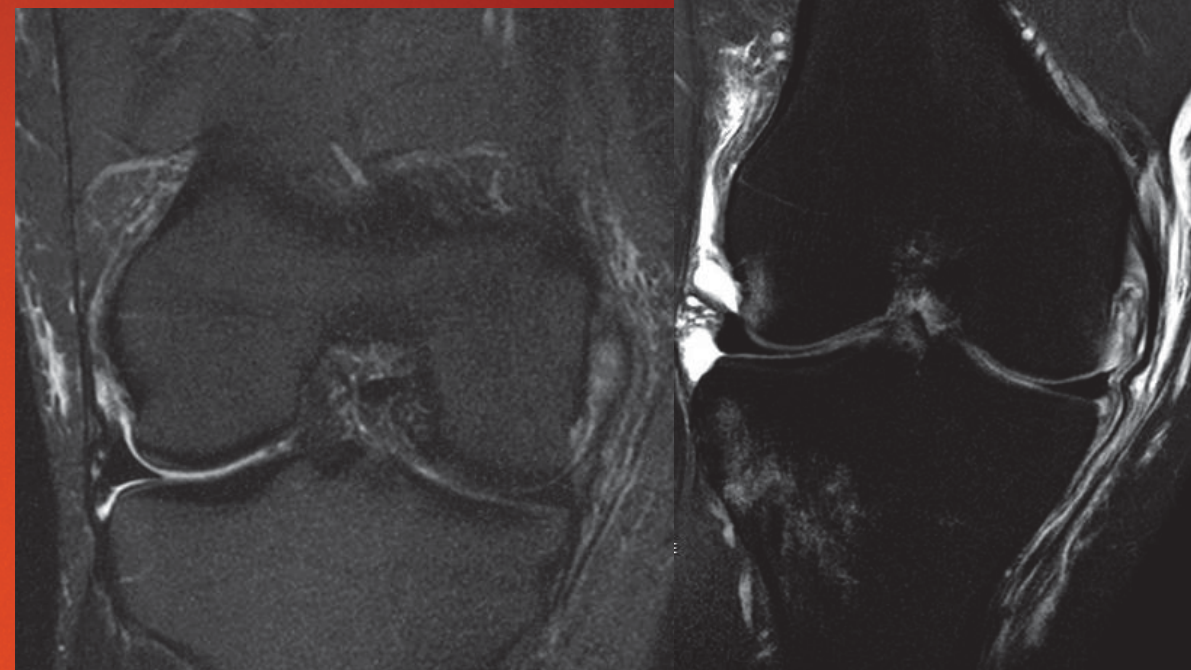
- ▶ Point of maximum tenderness highly correlated to injury location on MRI

- ▶ Valgus testing at 30 degrees

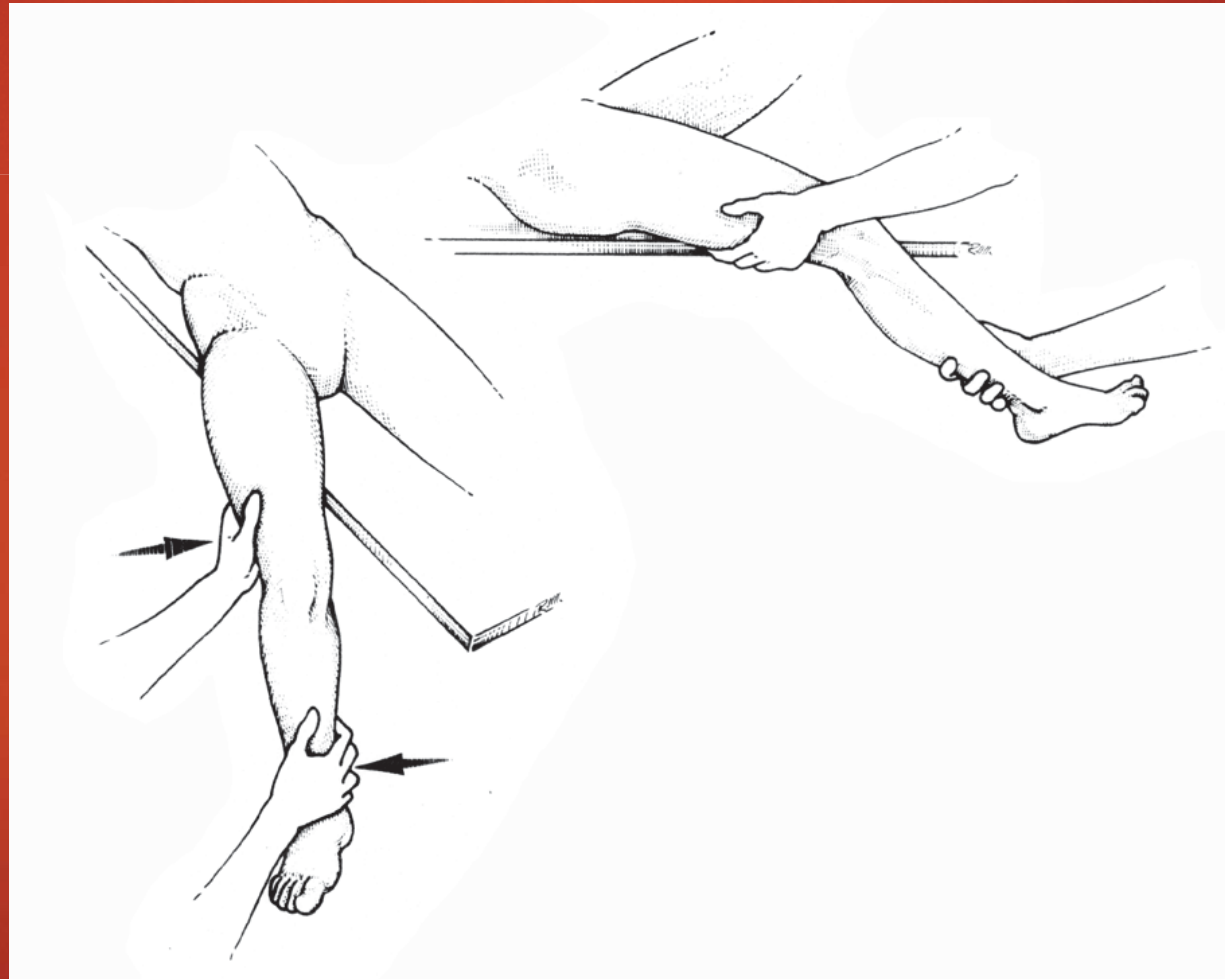
- ▶ MCL

- ▶ Valgus testing at 0 degrees

- ▶ Deep MCL, posterior oblique ligament



# Collateral Ligament Testing



# Grading Varus and Valgus Laxity

- ▶ Varus or valgus opening at 30 degrees flexion
  - ▶ Grade 0
    - ▶ 0-2mm
  - ▶ Grade 1
    - ▶ 3-5mm
  - ▶ Grade 2
    - ▶ 5-9mm
  - ▶ Grade 3
    - ▶ 10+mm



# MCL

- ▶ Medial Collateral Ligament
  - ▶ Anatomy
  - ▶ Function
  - ▶ Mechanism of injury
  - ▶ Other injuries with the same mechanism
  - ▶ Diagnosis
  - ▶ Other things in the neighborhood
    - ▶ Medial sided knee pain
      - ▶ Medial meniscus tear
      - ▶ Pes anserine bursitis



# Bursa

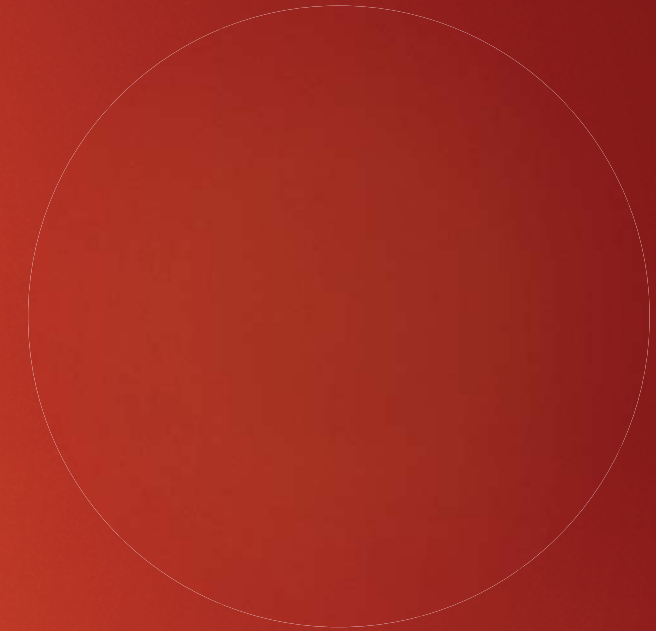


- Balloon like
- Normally contain a drop of fluid
- Help structures move by each other with less friction
- Common problem
  - Bursitis



# Treatment of MCL tears

- ▶ From low grade to complete tears even with an ACL
- ▶ Bracing (6-8 weeks)
  - ▶ Femoral sided tears (point of maximum tenderness)
    - ▶ Early range of motion
    - ▶ Unlock as quadriceps control allows
  - ▶ Tibial sided tears (point of maximum tenderness)
    - ▶ Two weeks locked in extension
    - ▶ Then unlock as quadriceps control allows
- ▶ For isolated MCL, return to play as comfort and function allow



# Knee Injury Initial Treatment

## Generic solution



## RICE

- ▶ Rest
- ▶ Ice
- ▶ Compression
- ▶ Elevation



# Nonsurgical Treatment of Collateral Ligament Injuries

- ▶ Generic rehab
- ▶ Add hinged knee brace
  - ▶ Can be single lateral hinge
- ▶ Progress functional recovery as quickly as tolerated
  
- ▶ Knee immobilizer versus hinged knee brace
  - ▶ Are they the same?





# Are these the same?

- ▶ Immobilizer versus hinged knee brace
  - ▶ Immobilizer in 15 degrees of flexion, without motion
    - ▶ Need the quadriceps to walk comfortably
  - ▶ Hinge brace locked at 0
    - ▶ Can walk comfortable without quadriceps function
    - ▶ Brace can be unlocked for range of motion
    - ▶ Can be made longer to better control varus/valgus stability



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# Femoral sided MCL tears with increased pain and decreased range of motion 2-3 weeks after injury

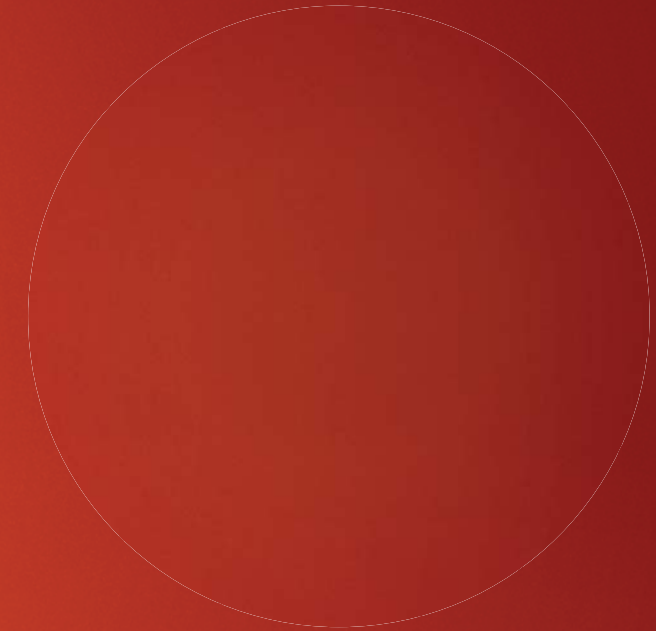
- ▶ Think about calcification
  - ▶ Treat with NSAID
    - ▶ Classically Indocin for 4 weeks

Later on x-ray Pellegini Steada calcification



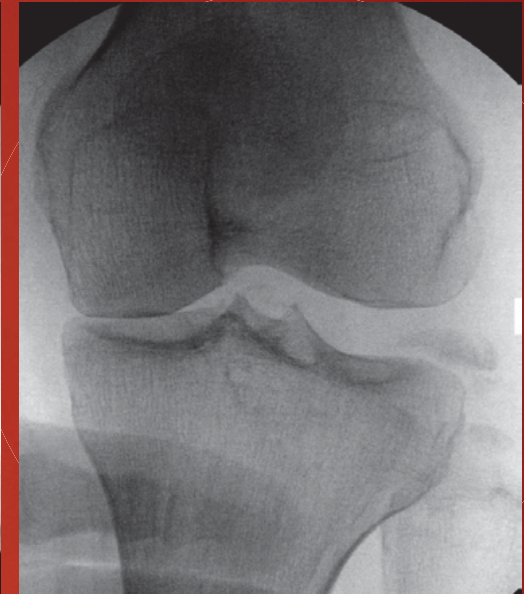
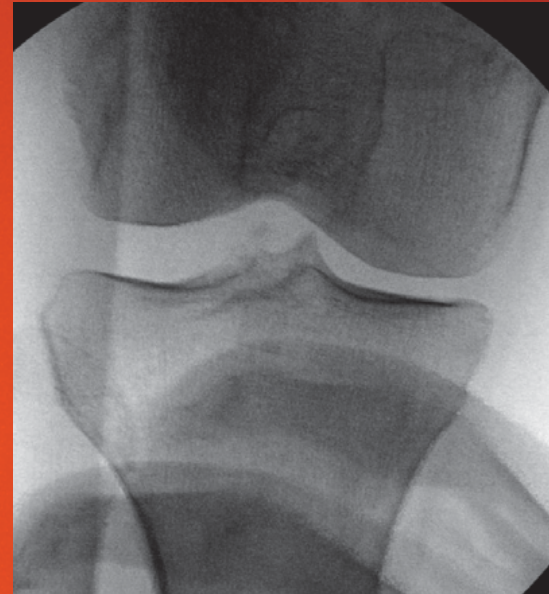
# Operative Treatment of MCL tears

- ▶ Acute repair
  - ▶ Intra-articular ligament entrapment
  - ▶ Large bony avulsion
  - ▶ Associated tibial plateau fracture
  - ▶ Displaced tibial sided tear over pes
- ▶ Laxity after conservative treatment combined with ACL tear
  - ▶ Stimulation procedure at time of ACL reconstruction
- ▶ Chronic symptomatic laxity or combined multi-ligament injuries
  - ▶ MCL reconstruction



# LCL (Posterolateral corner)

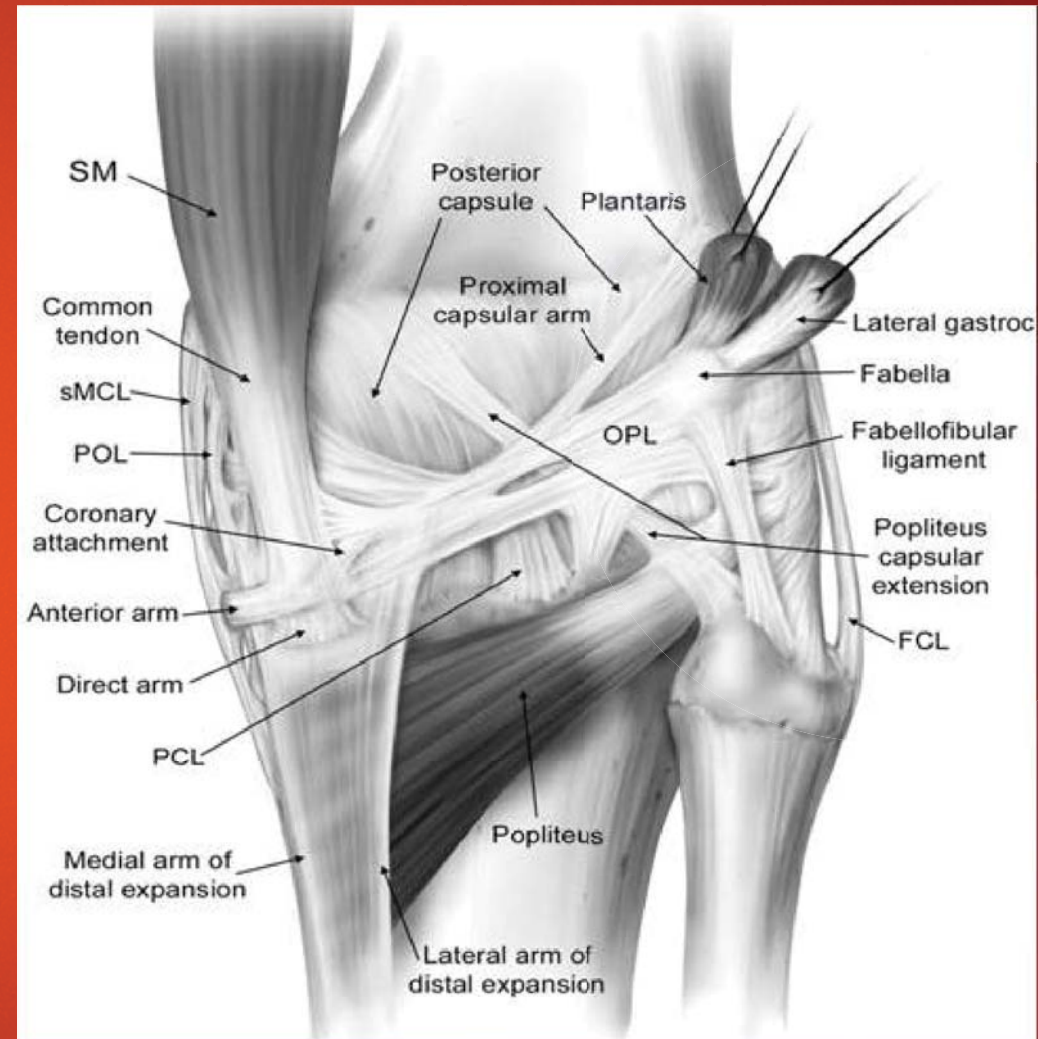
- ▶ Posterolateral corner
  - ▶ Anatomy
  - ▶ Function
  - ▶ Mechanism of injury
  - ▶ Other injuries with the same mechanism
  - ▶ Diagnosis
  - ▶ Other things in the neighborhood



# LCL (Posterolateral corner)

## ► Anatomy

- LCL
- Popliteus
- Popliteofibular ligament
- Arcuate ligament
- Fabellofibular ligament
- Biceps femoris
- Lateral gastrocnemius



# LCL (Posterolateral corner)

- ▶ Anatomy

- ▶ LCL
- ▶ Popliteus
- ▶ Popliteofibular ligament
- ▶ Arcuate ligament
- ▶ Fabellofibular ligament
- ▶ Biceps femoris

