Medial and Lateral Collateral Ligament Injuries

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Medial Collateral Ligament
- Most commonly injured
- Incidence is probably higher
- 50% chance of meniscal injury
- ACL most commonly associate

Lateral Collateral Ligament
- Incidence not known
- Isolated tear rare
- More functional knee disabilities

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Anatomy - MCL

- Static
  - Superficial medial collateral ligament
    - Medial femoral epicondyle to anteromedial tibia
    - Anterior fibers are constant tension throughout flexion
    - Posterior fibers are sack in flexion

- Deep medial collateral ligament
  - Capsular ligament
  - Meniscotibial and meniscofemoral fibers

- Posterior oblique ligament
  - Triangular capsular ligament
  - Tight in extension - slack in flexion
  - Dynamized by semimebranosus

Biomechanics

- Resist valgus and external rotation of tibia
- Superficial medial collateral ligament
  - 5-7 mm increase in laxity
  - 200-300% increase in rotational laxity

Dynamic

- Semimebranosus
- Pes Anserine
  - Sartorius
  - Semitendinosus
  - Gracilis
- Vastus medialis

Clinical Evaluation

- History
  - When
  - Activity
  - Mechanism
  - Pain
  - Swelling
  - ability to return previous injury since injury initial treatment

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Physical Exam
- Observation
  - Gait
  - Effusion

Mechanical
- Palpation
- Neurovascular
- ROM
- Abduction stress test
- Other ligament and structures

Abduction stress test at different degrees of flexion
- Grade I: 1-4 mm
- Grade II: 5-9 mm
- Grade III: 10-15 mm

Diagnostic Testing
- Radiographs
  - Fractures
  - Loose bodies
  - Physical injuries

Treatment
- Non-operative
  - Grade I and grade II injuries criteria
    - Stable in extension
    - No more than 10 mm of valgus opening at 30 degree flexion
    - No rotational instability
    - Localized tenderness
    - Minimal effusion
    - Normal radiographs

MRI
- Location of tear
- Degree of tear
- Associated injuries

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Operative treatment
- Grade III injuries
- Primary repair
- Usually associated with other injuries
- Reconstruction and/or augmentation

Rehabilitation

Non-operative treatment
- Immobilization for pain
- Isometrics - early
- WBAT
- ROM
- Functional bracing

Return to play:
- 90% muscle strength
- No pain with valgus stress at 30%
- No effusion

Operative treatment
- Isolated MCL repair or reconstruction
- Longer immobilization
- Limited weight bearing
- Return to play delayed

Rehabilitation is dominated by the major ligament repaired
Return to play is delayed by the extent of treatment

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Anatomy: LCL and PLC

- **Arcuate complex**
  - Lateral collateral ligament
    - Static restraint to varus
    - Static restraint to external rotation of the tibia

- **Arcuate ligament** – static
  - Variable
  - Reinforces posterolateral capsule

- **Popliteus muscle** – dynamic
  - Reinforces posterior lateral capsule
  - Internally rotates tibia

- **Popliteofibular ligament**
  - Variable
  - Static resistance to external rotation of the tibia

- **Biceps femoris tendon and iliotibial band**
  - Dynamic stability

Biomechanics

- **Lateral and posterolateral structures**
  - Variable
  - Stronger and more substantial
  - Subject to greater forces
  - Primary resistance
    - Varus rotation
    - External tibial rotation
    - Posterior tibial translation

Clinical Evaluation

- **History**
  - When
  - Activity
  - Mechanism
  - Pain
  - Swelling
  - ability to return
  - previous injury
  - since injury
  - initial treatment

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Physical Exam

- Observation
  - gait
  - effusion
  - edema
  - ecchymosis
  - deformity

- Mechanical
  - Palpation
  - Neurovascular
    - Peroneal nerve injury 15-30%
  - ROM
  - Adduction stress test
  - Increased external rotation of tibia at 30 degrees and 90 degrees of flexion

- Dial test
- Posterior tibial translation at 30 degrees not at 90 degrees
- External rotation recurvatum
- Reverse pivot shift test

Diagnostic Testing

- Radiographs
  - Fractures
  - Loose bodies
  - Physeal injuries

- MRI
  - Location of tear
  - Degree of tear
  - Associated injuries

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Treatment

- Non-operative
  - Grade I and grade II
  - 2-4 weeks of protected weight bearing
  - Progressive rehabilitation

- Operative
  - Generally grade III injuries
  - Combination injuries
  - Primary repair - augmentation
  - Acute injuries much easier

Rehabilitation

- Depends upon repair and/or augmentation
  - Limited weight bearing
  - Immobilization or combination of ROM and immobilization
  - Slow progression back to play

Adolescents

- Consider physeal injuries
- Knee pain - think hip

Thank You

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