Introduction

- Approach to patient with knee pain / injury
  - History
  - Examination
  - Radiographs
  - Guidelines for additional imaging
History

• Age
• History of specific injury / traumatic event?
• Location of pain
• Nature of pain
• Are there mechanical symptoms?
• Aggravating / precipitating factors

Was There A Specific Injury?...

• How did the pain start?
• Exact mechanism
  – Direction of force
  – Side of impact
• Gives clues to specific structures involved
Location of Pain

• Localized and specific vs. general
• Nature of pain – sharp vs. achy

Mechanical symptoms

• Usually indicates an intra-articular process
• Disruption of smooth articular surfaces, cartilage fragment, subtle instability
• Ex: catching, locking, buckling / giving way, “unstable”
**Aggravating / Precipitating Factors**

- Stairs
- Start up
- Prolonged sitting
  - Driving
- Twisting / squatting
- Side-to-side activity
- Impact activity

**Examination**

- Gait and Alignment
- Swelling / Ecchymosis
  - Side-to-side deformity
- Joint Effusion
- Tenderness
- Range of Motion
- Ligament exam
- Special Tests
Gait and Alignment

- Painful weight-bearing
- Guarding with certain motions
- Varus or valgus alignment

Swelling and Ecchymosis
**Is There an Effusion?**

- Intra-articular injury, synovial irritation
  - Rare to have a significant intra-articular process without an effusion.
  - Long-standing DJD or meniscus tear

**Knee Aspiration**

- Supine; 20-30 deg flexion
- Supra-patellar – med / lat
- Local anesthetic
- Aspirate 18G needle
- Specimen
  - g/s, cell count, crystal analysis
  - a/an cultures
Knee Effusion…
Intra- vs. Extra-articular

• **Intra-articular:**
  – DJD
  – Meniscus tear
  – Ligament injury (ACL)
  – Cartilage injury
  – OCD
  – Crystalline arthritis
  – Synovial disorder

• **Extra-articular**
  – Patella / quad tendonitis
  – Patello-femoral syndrome
  – Pre-patellar bursitis
  – ITB syndrome
  – HS strain
  – Gastroc injury
  – Pes bursitis

Tenderness

– Specific vs. global
– Joint line
– Collateral Ligaments
– Patello-femoral
– Quad and Patellar tendons
Range of motion

- Pain with deep flexion / full extension
- Active SLR or knee extension
- Crepitus

Patellar Compression / Grind
Ligaments

- Compare difference with uninjured side
- Pain and/or instability
  - Significant instability generally not subtle
- Collaterals (MCL and LCL)
  - Medial collateral ligament
  - Lateral collateral ligament
- Cruciates (ACL and PCL)
  - Anterior cruciate ligament
  - Posterior cruciate ligament

Collateral Ligaments.
MCL and LCL

- Varus and valgus stress @ 0 and 30 deg
  - Normally more lax to varus
- Instability at full extension means significant injury
  - 0 degrees – collaterals, capsule, and cruciates
  - 30 degrees - collateral ligament complex
Grading Ligament Injuries

I - pain to stress; no instability
II - pain to stress; + instability; firm endpoint
III - complete tear; laxity; no endpoint

Medial Collateral Ligament
Lateral Collateral Ligament

- Lachman test
- Pivot-shift test
- Anterior drawer test

Anterior Cruciate Ligament (ACL)

- Lachman test
- Pivot-shift test
- Anterior drawer test
Lachman Test
Pivot-Shift Test

Posterior Cruciate Ligament (PCL)

- Posterior Drawer
  - 90 deg flexion
  - Posterior force on proximal tibia
- Medial tibial stepoff
**Special Tests…**

**McMurray’s test**

- Mensicus pathology
- Flexion 90 deg; axial compression; IR & ER foot
- “captures” unstable meniscus with rotation

**Special Tests…**

**Apley’s compression test**

- Prone; 90 deg flexion; IR & ER foot
DX: meniscus tear

- Joint line tenderness
- Effusion
- Pain with forced flexion
- Block to full extension
- (+) McMurray’s or Appley’s test

Special Tests...
Quad / Extensor Mechanism
Tightness

- Prone position; pelvis stabilized; passive knee flexion
**Special Tests…**
Quad / Extensor Mechanism
**Tightness**

- Indicates patello-femoral overload
  - May cause significant pain without objective findings
  - Anterior pain, global
    - Worse with stairs, start-up, prolonged sitting

**Radiographs…**
Routine initial x-rays

- Evaluate bone quality, alignment, joint space narrowing, degenerative changes.
- **Age < 40 yrs**
  - AP, lateral, sunrise (PF) views
Radiographs…
Routine initial x-rays

- Age > 40 yrs
  - Bilateral AP, Rosenberg, lateral, and sunrise views
  - Standing (weight-bearing) to evaluate for joint space narrowing

Further imaging…
MRI indications

- History of specific injury
- Effusion
- Sharp, localized pain
- Instability
- Mechanical symptoms
Thank You

Madeline

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- Ybgtb
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