Knee Pain in Primary Care

Caleb Holder, DO
Lecture Objectives

❖ To improve diagnostic skills with knee complaints
❖ To improve confidence and competence in practice when seeing patients for knee complaints
❖ To understand management and expected outcomes of common knee problems
# Possible Causes of Knee Pain

- Meniscal Injury
- Ligament Injury
- Plica
- Osteoarthritis
- RA
- Synovitis
- Infection
- Patellar
- Osteochondral Defect

- PVNS
- Tumor
- Avascular Necrosis
- Referred Pain
- Vascular
- Radicular
- Bruise
- Sprain
- Tendinitis

- Osgood-Schlatters
- Tendon rupture
- Chondromalacia
- Bursitis
- Loose Body
- Deformity
- Dislocation
- Fracture
- Neuroma
- Gout
Statistics

25% of adults

Prevalence is increasing, accounts for ~4 million PCP visits annually

Women experience ACL tears 9-10x more often than men
Different Strategies

1. Knowing the different presentations
2. Separating the diagnoses by age
3. “Point to the Pain”
4. Relying on Examination
5. When can I refer them?
Ask These Questions

1. Trauma?
2. Is there an effusion?
3. Where exactly is the pain?
4. Associated with activity?
5. Hx of knee injury or previous surgery?
6. Other joints affected?
7. Constitutional symptoms?
If there’s no trauma, is there an effusion?

Most commonly, pt will present as atraumatic knee pain *without* an effusion.

If there’s an effusion -> ARTHROCENTESIS

- Crystal arthropathy (gout)
- Infectious arthritis
- Systemic rheumatic disease (RA, psoriatic arthritis)
Point to the Pain

Use anatomy to your benefit
Osteoarthritis can cause diffuse or focal pain in any of several locations
Anterior Knee pain - most common
Medial Knee pain
Lateral Knee Pain
Posterior Knee Pain
Relying on Physical Exam

Inspect
Palpate
Range of Motion and Strength
Neurovascular Assessment
Special Tests (Provocative testing)
Physical Exam Notes

PE is moderately sensitive and specific for knee pain

Lachman - more sensitive and specific than anterior drawer sign (pubmed)

Joint line tenderness - sensitive for meniscal tears (75%), but not specific (27%)

McMurray Test is specific (97%) for meniscus tears, but not sensitive (52%)

Thessaly test is preferred over the McMurray test or other evaluation for joint-line tenderness (C Evidence Rating)
Physical Exam Notes

Evaluating for Effusion

- No particular test is the best

**Ballottable Patella**

**Bulge Sign**
Outline

Case 1: Knee pain following recent trauma - football game
Case 2: Atraumatic knee pain associated with joint effusion - on a plane, tap
Case 3: Atraumatic knee pain NOT associated with joint effusion
Case 1: Knee Trauma

A 18 y/o football player presents to the office Monday morning after injuring his knee in the game last Friday night. He felt a pop, but was able to walk off the field after evaluated by the athletic trainer. He has been using Ibuprofen without relief. He denies any popping/clicking.
Case 1: Physical Exam

1. Inspect - no bruising, normal alignment
2. Palpate -
   a. Lateral joint line tenderness
   b. No patellar tenderness
   c. + Fibular head tenderness
   d. No Effusion
3. Examine:
   a. ROM - Extension to 0 degrees. Flexion to 75 degrees.
   b. Strength - 5/5 Extension, 4/5 Flexion
   c. Special Tests: ***
      i. Anterior Drawer - negative
      ii. Posterior Drawer - negative
      iii. McMurray's - negative
      iv. Varus Stress - negative
      v. Valgus Stress - positive
Case 1: Knee trauma

Ottawa Knee Rules - “A evidence rating”

- Determines if radiographs should be obtained
1. Age > 55
2. Isolated patellar tenderness*
3. Fibular Head tenderness
4. Inability to flex 90°
5. Can’t bear weight** immediately after injury or for > 4 steps in ED.
- If 1+, then imaging is recommended
Case 1: Knee Trauma

Knee X-ray:

Weight bearing AP
Rosenberg
Weight bearing lateral
Case 1:

X-ray shows no acute fracture.

What would you do next? MRI or physical therapy?

American Medical Society for Sports Medicine:

“Avoid ordering Knee MRI for a patient with anterior knee pain without mechanical symptoms or effusion unless the patient has not improved after completion of an appropriate functional rehabilitation program”
Review of the Case and obtaining imaging:

1) History: Knee Injury
   a) Effusion? -> no, but if present, sign of bad injury

2) Physical Exam: Do the same every time
   a) Inspect
   b) Palpate
      i) Joint line tenderness
   c) ROM
   d) Strength
   e) Neurovascular
   f) Special Tests
      i) Lachman
      ii) Anterior Drawer
      iii) Posterior Drawer
      iv) Posterior Sag Sign
      v) Varus Stress
      vi) Valgus Stress
      vii) Thessaly
      viii) McMurray - 95% sensitive

MRI is indicated
Case 2: Atraumatic Swollen Knee

You are the physician on a cruise ship for a 5 day cruise in the Caribbean. A 53 y/o gentleman with no significant past medical history presents with swelling to the left knee. It was present before the cruise, but has worsened since he’s been doing activities on the excursions. He denies any trauma.
Case 2: Atraumatic Swollen Knee

- **Exam:**
  - Mild diffuse tenderness, + effusion, no erythema
- **Rule Out:**
  - Infection (hematogenous, post-op, septic, gonococcal)
  - Inflammation (RA, psoriasis, etc)
  - Reactive (meniscus, DJD)
- **Plan:**
  - X-ray: AP/Lateral/Merchant view
  - Labs: CBC w/ diff, ESR, CRP
  - ASPIRATE
    - Fluid Labs: gram stain, glucose, protein, bacterial culture, special tests (crystals)
Arthrocentesis
Case 2: Atraumatic Swollen Knee

Labs come back:

- CBC w/ Diff: WBC 10.4, Hgb 14.0, Plt 300
- ESR: nml
- CRP: nml

Fluid Analysis

- Color - Yellow
- WBC 1,000
- Gram stain negative
## Case 2: Atraumatic Swollen Knee

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Color</th>
<th>Clarity</th>
<th>Viscosity</th>
<th>WBC</th>
<th>PMN’s</th>
<th>Culture</th>
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<tbody>
<tr>
<td>Normal</td>
<td>Clear</td>
<td>Transparent</td>
<td>High</td>
<td>&lt;200</td>
<td>&lt;25%</td>
<td>Negative</td>
</tr>
<tr>
<td>Reactive</td>
<td>Yellow</td>
<td>Transparent</td>
<td>High</td>
<td>200-2k</td>
<td>&lt;25%</td>
<td>Negative</td>
</tr>
<tr>
<td>Inflammatory</td>
<td>Yellow/green</td>
<td>Opaque</td>
<td>Low</td>
<td>2k-150k</td>
<td>&gt;50%</td>
<td>Negative</td>
</tr>
<tr>
<td>Infectious</td>
<td>Yellow</td>
<td>Opaque</td>
<td>Variable</td>
<td>15k-200k</td>
<td>&gt;75%</td>
<td>Positive</td>
</tr>
</tbody>
</table>

*Don’t forget to add crystals for gout/pseudogout*
Case 3: Atraumatic knee pain without effusion

A 43 y/o female runner with no significant past medical history presents to the office for evaluation of right knee pain with running. She has a history of patellar tendonitis, which had improved with physical therapy. The exercises she does at home has not improved her pain this time. She is taking Ibuprofen for pain, but is hoping to figure out the problem so she can continue running.
Case 3:

- History: No trauma, no swelling
- “Point to the pain” -> Anterior Knee
- Exam:
  - No abnormal findings, but when palpating the patellar tendon, that’s where she experiences pain
  - Squatting with pain
- Xray?
- MRI?
Management of Common Conditions

- Meniscus
- Ligaments
- Knee Overuse Injuries
- Knee Cartilage Lesions
Key Recommendations

Rehabilitation is as effective as arthroscopy for atraumatic meniscal tears without mechanical symptoms

Glucosamine/chondroitin supplementation - limited effectiveness for osteoarthritis

NSAIDs are effective for short-term treatment of knee osteoarthritis and patellofemoral pain syndrome

Knee braces are reasonable, but shouldn’t replace rehab

Exercise-based therapy is first line treatment for osteoarthritis and patellofemoral pain syndrome
Knee Osteoarthritis

Non-pharmacologic:

- Physical Therapy and Weight Loss
- Ice
- Patellar taping
Knee Osteoarthritis Treatment

Pharmacologic

- Extended Release Acetaminophen 1,300mg TID
- Glucosamine/chondroitin
- Corticosteroid Injection
- NSAIDs effective
- Opioids if conservative fails and not surgical candidate
Patellofemoral Syndrome

Non-pharmacologic:
- Physical Therapy - Reduces pain and improves functionality
- U/S and patellar taping - conflicting results

Pharmacotherapy:
- NSAIDs

Braces - limited evidence for lateral patellar buttress brace
Tx Meniscal, Tendon, Ligament Pathology

Physical therapy - improves physical function and pain
  Eccentric training

Pharmacology: NSAIDs work, but can affect tendon healing

Steroid Injections

Braces - Immobilizers decrease pain in major ligamentous tears at first
Specific Treatments

Modalities

- Taping - widely employed, multiple trials have shown not significant benefit
  - McConnell Taping

- Bracing - no good data to demonstrate benefit; Patella stabilizing brace (Palumbo knee brace)

Alternatives

- Acupuncture - no better than placebo. Benefit at 4 weeks
- Chiropractic patellar mobilization - no statistical improvement
- Manipulation - decreased quadriceps inhibition
Thank you
References


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4041260/ - Knee pain as the reason for encounter in General Practice


https://www.cdc.gov/arthritis/pain/index.htm - CDC.gov

https://www.aafp.org/afp/2019/0115/p88.html - AAFP
