Practical Office Orthopedics: Knee and Shoulder

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10/12/2019
Learning objectives

Upon completion of this session, participants should be able to:

1. Name 3 exam maneuvers to identify a meniscus tear.
2. List 3 views to order for knee x-rays
3. Explain treatment for degenerative meniscus tear +/- OA
4. Name 2 causes of shoulder pain when both active and passive range of motion are limited.
5. Identify a full thickness rotator cuff tear on physical exam.
6. Explain treatment for rotator cuff disease
Knee cases
Musculoskeletal work-up

- **H**istory
- **I**nspection
- **P**alpation
- **R**ange of motion
- **O**ther **T**ests
Case #1

35 y/o woman with medial-sided pain and swelling of the R knee x 12 weeks. Twisted the knee playing soccer. No locking, no instability. Symptoms ongoing despite 6 weeks of physical therapy. She brings with her normal x-rays. 

R knee exam:
- (+) effusion
- ROM 0-130, slightly limited due to effusion and tightness
- Tender medial joint line. No bony tenderness.
- Medial knee pain with McMurray testing and squat
- No ligamentous laxity
What do you recommend next?

A. Orthotics for arch support for her feet
B. Patellar taping to medialize the patella
C. Medial compartment unloader brace
D. Knee aspiration and corticosteroid injection
E. Knee MRI
Case #1

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R knee exam:
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- Medial knee pain with **McMurray testing and squat**
- No ligamentous laxity
Knee anatomy

2 tendons
4 bones
3 compartments
4 ligaments
2 menisci
2 menisci (or meniscuses)

- Medial and lateral
  - Shock absorber
  - Stabilizer
Joint line tenderness (JLT)

Medial: Sensitivity 83%, Specificity 76%

Lateral: Sensitivity 68%, Specificity 97%

Meniscus: McMurray

Sensitivity medial 65%, Specificity medial 93%

Video used with permission from Anthony Luke, MD
Composite exam: JLT + McMurray

- JLT more sensitive than McMurray for meniscus tear
- McMurray more specific than JLT for meniscus tear
- Composite assessment LR 2.7 for positive exam

Meniscus: squat

- Patient stands flat-footed
- Examiner holds their hands for balance
- Patient squats as low as possible
- (+) If pain or feeling of locking while knees bent

Sensitivity 75-77%, Specificity 36-42%

Case #2

60 y/o woman presents with 3 months of medial knee pain. (+) swelling, and instability. No frank locking. Pain is worse with weight bearing. Better with rest, ice, and NSAIDs.

Exam: Neutral knee alignment when standing, tender medial joint line + medial femoral condyle + medial tibial plateau. Small effusion. ROM 0-120, limited by pain. Mild crepitus. (+) medial McMurray, medial knee pain with squat. No ligamentous laxity.
What is the best next step for this patient?

A. Order knee MRI
B. Refer to physical therapy
C. Refer for arthroscopic debridement of meniscus tear and lavage
D. Refer for total knee arthroplasty
Case #2

60 y/o woman presents with 3 months of medial knee pain. (+) swelling, and instability. No frank locking. Pain is worse with weight bearing. Better with rest, ice, and NSAIDs. She brings a knee MRI for your review.

Exam: Neutral knee alignment when standing, **tender medial joint line** + **medial femoral condyle** + **medial tibial plateau**. **Small effusion.** ROM 0-120, limited by pain. **Mild crepitus.** (+) **medial McMurray, medial knee pain with squat.** No ligamentous laxity.
## Criteria for diagnosis of knee OA

<table>
<thead>
<tr>
<th>Clinical</th>
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<tbody>
<tr>
<td><strong>Knee pain and at least 3 of 6:</strong></td>
</tr>
<tr>
<td>• Age &gt; 50</td>
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<tr>
<td>• Stiffness &lt; 30 minutes</td>
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<tr>
<td>• Crepitus</td>
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<tr>
<td>• Bony tenderness</td>
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<td>• Bony enlargement</td>
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<tr>
<td>• No warmth</td>
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</table>

95% sensitive 69% specific

Knee x-rays

3 views for knee pain

1. **Weight bearing** flexed PA (aka notch view)
2. Lateral of affected side
3. Sunrise or merchant view
Does arthroscopic partial meniscectomy (APM) help middle aged patients with degenerative meniscus tears +/- OA?

- Arthroscopy *not* indicated for knee OA as no more effective than non-operative care *(Mosely JB et al, NEJM 2002; Kirkley A et al. NEJM 2008)*


  - Limitation: difficult to interpret due to cross-over (30%) before assessment of the primary outcome

  - Factors associated with crossover from PT to APM: shorter duration of symptoms and higher initial pain score *(Katz JN et al. JBJS 2016.)*
Osteoarthritis with meniscus tear

- Degenerative meniscus tear is part of the natural history of osteoarthritis
- Treat with non operative knee osteoarthritis protocol initially
- Imaging: Start with x-ray
- Consider referral for arthroscopy vs MRI if exam c/w meniscus tear and not improving with PT
- Could consider arthroscopic meniscus surgery if non-op program not helping or if patient presenting soon after symptom onset with high initial pain score
Shoulder cases
Shoulder bony anatomy

3 bones:
- clavicle
- scapula
- humerus

4 joints:
- acromioclavicular
- glenohumeral
- scapulothoracic
- sternoclavicular

Slide adapted with permission from Drs. Meg Pearson and Steve Bent
Rotator cuff anatomy

- **Supraspinatus**: Abduction
- **Infraspinatus**: ER
- **Teres Minor**: ER
- **Subscapularis**: IR
Case #1

50 y/o RHD woman with type 2 diabetes presents with 3 months of severe R shoulder pain. No injury. Waking up at night due to pain. Shoulder feels very stiff. She is having trouble reaching behind and raising arm above head.

On exam she has no muscle atrophy and no point tenderness. There is decreased active and passive range of motion of the right shoulder. Her rotator cuff strength is 5/5 though difficult to perform due to limited range of motion and pain.

A R shoulder x-ray is normal.
How would you treat this patient?

A. Provide R shoulder sling to use for comfort.
B. Recommend shoulder steroid injection.
C. Obtain shoulder MRI.
D. Refer to surgeon for arthroscopy.
Shoulder exam: Range of motion is key

Active ROM
- Decreased

Passive ROM
- Decreased

Frozen shoulder
- Normal
- Abnormal

X-ray
- Normal
- Abnormal

GH joint arthritis
- Normal
- Abnormal
Active range of motion

1. Forward flexion
2. Abduction
3. External rotation
4. Internal rotation
Passive range of motion

1. Abduction (glenohumeral joint allows abduction from 0° to 90°; the rest of abduction is due to scapulothoracic motion)
2. External rotation
3. Internal rotation
Limited active and passive ER key finding
Adhesive capsulitis is a clinical diagnosis

- Women > men
- 5x more common in diabetics
- Age 40-60 y/o
- No need for MRI
- X-rays helpful to r/o glenohumeral joint arthritis

3 stages of adhesive capsulitis

Freezing
3-9 months
- ↑ pain
- ↓ ROM
- Pain at rest, sleep

Frozen
4-12 months
- ↓ pain
- Stable, decreased ROM

Thawing
12-42 months
- Gradual ↑ ROM

Average time to resolution: 1-3 years
Treatment for adhesive capsulitis

- Associated w/diabetes: A1c or fasting blood sugar
- Pain control: NSAIDs or injected corticosteroids
  - Does not change disease course
  - Does help with pain control
- +/- physical therapy to help restore ROM
- Capsular distention injections
- Surgery (rarely)

Case #2

57 y/o RHD man presents with R shoulder pain that started after he slipped and fell 3 months ago. Pain lateral shoulder deep to deltoid. He tried physical therapy without benefit. Waking at night from sleep due to pain.

Exam: Shoulder is nontender. Shoulder AROM intact with pain on abduction between 60 and 120 degrees. 4/5 strength with Empty can (aka Jobe's) test. (+) External rotation lag and internal rotation lag tests.
What is the most likely diagnosis?

A. Biceps tendinitis
B. Acromioclavicular osteoarthritis
C. Labral tear
D. Rotator cuff tendon tear
E. Cervical radiculopathy
Rotator cuff disease (RCD)

1. Impingement
2. Tendinitis/tendinopathy
3. Partial thickness tear
4. Full thickness tear
Rotator cuff disease is common

- Prevalence of shoulder pain in general population: 14-34% $^{1,2}$
- Of patients with shoulder pain, RCD is cause in 65% $^3$

Case #2

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Exam: Shoulder is nontender. Shoulder AROM intact with pain on abduction between 60 and 120 degrees. 4/5 strength with Empty can (aka Jobe's) test, (+) External rotation lag and internal rotation lag tests.
Shoulder exam: Range of motion is key

Adapted from: O'Kane and Toresdahl.
Painful arc for rotator cuff disease

- Examiner brings arm into abduction
- (+) If pain between 60-120°
- If painful, positive LR 3.7 for rotator cuff disease.
- This is the most sensitive and specific pain provocation test for rotator cuff disease (more so than Hawkins, Neers).

JAMA. Rational clinical exam: Does this patient have rotator cuff disease? Aug 2013.
Empty can test (Jobe’s test)

71% sensitivity
41% specificity for rotator cuff disease.
(+): LR 1.3

JAMA. Rational clinical exam: Does this patient have rotator cuff disease? Aug 2013.
Infraspinatus = external rotation lag test

- Examiner passively rotates patient’s arm into full ER
- Elbow at 90° flexion, 20° abduction
- (+) if patient unable to maintain position of full ER

Positive LR 7.2
Negative LR 0.57 for full thickness rotator cuff tear
Subscapularis = internal rotation lag test

- Examiner lifts hand of affected arm off of back
- Patient maintains position
- (+) if patient unable to maintain position

Positive LR 5.6
Negative LR 0.04 for full thickness rotator cuff tear

JAMA. Rational clinical exam: Does this patient have rotator cuff disease? Aug 2013.
Rotator cuff disease treatment

- Impingement
- Tendinitis, tendinopathy

\[ \text{PT} +/- \text{Injection} +/- \text{Medication} \]

- Traumatic full thickness tear → Consider orthopaedics referral.
- Atraumatic partial and full thickness tears → data unclear about what’s best: surgery or no surgery

Main goals for the internist

- Identify patients who have RCD
  - Of those, identify those who have rotator cuff tears and refer
    - Especially in cases where
      - Acute injury (acute tendon tear)
      - Acute change in clinical course (known tear, now increased in size)
- Think of MRI as a useful tool to guide surgery
Take home points

1. Name 3 exam maneuvers to identify a meniscus tear.
2. List 3 views to order for knee x-rays
3. Degenerative meniscus tears +/- knee OA: explain treatment
4. Name 2 causes of shoulder pain when both active and passive range of motion are limited.
5. Identify a full thickness rotator cuff tear on physical exam.
6. Rotator cuff disease: explain treatment
Name 3 exam maneuvers to identify a meniscus tear

1. Joint line tenderness
2. McMurray
3. Squat
List 3 views to order for knee x-rays

1. **Weight bearing** flexed PA (aka notch view)
2. Lateral of affected side
3. Sunrise or merchant view
Explain treatment of a patient with a degenerative meniscus tear +/- OA

- Degenerative meniscus tear is part of the natural history of osteoarthritis
- Treat with non operative knee osteoarthritis protocol initially
- Imaging: Start with x-ray
- Consider referral for arthroscopy vs MRI if exam c/w meniscus tear and not improving with PT
- Could consider arthroscopic meniscus surgery if non-op program not helping or if patient presenting soon after symptom onset with high initial pain score
2 causes of shoulder pain when both active and passive range of motion are limited.

- Arthritis of the glenohumeral joint
- Adhesive capsulitis (frozen shoulder)
Identify a full thickness rotator cuff tear on physical exam.

- Painful arc
- Empty can (aka Jobe’s) test
- External rotation lag test
- Internal rotation lag test
Explain treatment recommended for patients with rotator cuff disease

- Impingement
- Tendinitis, tendinopathy

\[ \text{PT} \pm \text{Injection} \pm \text{Medication} \]

- Traumatic full thickness tear $\rightarrow$ Consider orthopaedics referral.
- Atraumatic partial and full thickness tears $\rightarrow$ data unclear about what’s best: surgery or no surgery
Save the Date
December 12-14 2019

- 3 days
- Head to toe
- Sports medicine
- Hands on msk exam

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https://binged.it/2QCSWcw
Watch: How to do a Subacromial Shoulder Injection Video

https://youtu.be/m3ukkCBTie8
UCSF Sports Medicine Rehab
Free online video and handouts for common sports injuries

Knee | Shoulder | Hip
---|---|---
Foot/ankle | Hamstring | Spine

https://sportsrehab.ucsf.edu/
Revisit the knee and shoulder with

https://thecurbsiders.com/podcast/124-the-shoulder-simplify-your-approach

https://thecurbsiders.com/?s=knee
Thank you!

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