Hot Topics in Sports Medicine 2015

Carlin Senter M.D.
UCSF Internal Medicine and Orthopaedics
UCSF Advances in Internal Medicine

Hot Topics in Sports Medicine 2015

• Sports concussion
  – Diagnosis
  – Treatment

• Knee pain due to osteoarthritis + meniscus tear
  – Exam
  – Treatment evidence

• Rotator cuff tears
  – Physical examination evidence
Concussions are common

- mTBI accounts for 80-90% of TBI in civilian and military populations (Levin HS and Diaz-Arrastia RR. Lancet Neurol 2015; 14: 506-17.)
Concussion numbers increasing


Concussion legislation

Case #1

• 40 y/o woman presents to your office for ER follow-up two days after bike accident.
• Slid out while crossing streetcar tracks on wet city streets.
• No loss of consciousness.
• Taken by ambulance to ER.
• Had trauma work-up including head CT (-).
• Has headache, fatigue, dizziness, light sensitivity. Trouble staying focused at work, sleeping more than usual.
• Normal neck and neurologic exam.

Concussion definition

• Type of mild traumatic brain injury
• Blow to head, neck, body → force to head
• Rapid onset of neurologic impairment
• Symptoms usually resolve in weeks, spontaneously, but in some cases can be prolonged.
• May or may not include loss of consciousness.
• CT and MRI studies are normal

Adapted from 4th International Conference on Concussion in Sport (2012). Br J Sport Med.
Concussion symptoms

- Physical
- Cognitive
- Emotional
- Sleep


Clinic concussion evaluation

- History of injury
- PMHx ADHD, anxiety, depression, head injury
- Clinical status: improving or worsening since time of injury?
- Neck and neurological exam
• Age > 60
• GCS < 14 initially or < 15 two hours post injury
• Vomiting more than once
• Seizure
• LOC
• Focal neuro deficit
• Suspected skull fx
• Severe headache

• Decreased alertness after initially lucid
• High velocity injury (hit by car, fall from height)
• Comorbid illness (cirrhosis, diabetes, immunosuppression)
• Pregnancy
• Anticoagulants


How severe is my concussion?

Symptom resolution

• Athletes become asymptomatic in 1-2 weeks (Williams RM et al. Sports Med. 2015 Mar 28.)
• Recovery in athletes may be faster than in others (Levin HS and Diaz-Arrastia RR. Lancet Neurol 2015; 14: 506-17.)
• Pre-existing neuropsychiatric disorder associated with symptoms > 3 months (Levin HS and Diaz-Arrastia RR. Lancet Neurol 2015; 14: 506-17.)

Case #1

• 40 y/o woman presents to your office for ER follow-up two days after bike accident.
• Slid out while crossing streetcar tracks on wet city streets.
• No loss of consciousness.
• Taken by ambulance to ER.
• Had trauma work-up including head CT (-).
• Has headache, fatigue, dizziness, light sensitivity. Trouble staying focused at work, sleeping more than usual.
• Normal neck and neurologic exam.
How would you treat this patient?

1. Order urgent head CT to rule out subtle post traumatic bleed, return to clinic after CT.

2. Rest from work and biking, return to clinic 1 week.

3. Return to work but rest from biking, return to clinic in a month.

4. Return to work and biking.

Concussion treatment

- Cognitive rest
- Physical rest
- Medication
  - Tylenol
  - Ibuprofen after first 72 hours
- No driving
- No alcohol
- Education
Return to school/work progression

No school. OK to do light reading, little bit TV, drawing, cooking as long as doesn’t worsen symptoms.

15 min cognitive activity at a time.

30 min schoolwork at a time until can do 1-2 hours.

Return to ½ day of school.

Return to full day of school.

http://www.chop.edu/service/concussion-care-for-kids/returning-to-school.html

Physical rest

• Evidence sparse on benefit of rest
• Management largely guided by expert opinion
• No same-day return to play
• Once concussion symptoms have resolved gradually return to play
**Return to play progression**

- Asymptomatic
  - Light aerobic activity
- Non-contact training
- Full contact practice
- Clinician clearance
- Game play


**Concussion statement 2012**

Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012

Case #2

- 55 y/o man with medial-sided pain and swelling of the R knee for 6 weeks.
- No locking, no instability
- Exam: effusion, tender medial joint line and above/below medial joint line, (+) medial knee irritation with medial McMurray, (+) medial pain with squat and Thessaly, no ligamentous laxity
- He brings with him x-rays and MRI for your review

Area of tenderness

Meniscus: McMurray

Sensitivity medial 65%, Specificity medial 93%


Meniscus: Thessaly

Video used with permission from Anthony Luke, MD.
Meniscus: squat

Radiograph

3 views for knee pain

– Weight bearing flexed PA (aka notch view)
– Lateral of affected side
– Sunrise or merchant view

MRI - report

• Menisci: complex degenerative tearing of the medial meniscus posterior horn and body.
• Cruciate ligaments: intact
• MCL/LCL: intact
• Extensor mechanism: intact
• Cartilage and bone: moderate-grade cartilage loss over the medial femoral condyle and medial tibial plateau

Diagnosis?

A. Medial meniscus tear
B. ACL tear
C. Moderate medial compartment osteoarthritis
D. Patellar dislocation
E. Septic arthritis
F. Medial meniscus tear and moderate medial compartment osteoarthritis
Initial treatment?

A. Refer for arthroscopic debridement of meniscus tear and lavage
B. Nonoperative knee OA program
C. Refer for total knee arthroplasty

• 188 patients followed x 2 years
• Primary endpoint WOMAC score (knee pain + fxn)
• Avg age 60, 2/3 female, BMI 31
• Excluded bucket handle meniscus and severe varus or valgus alignment
Interventions

• Control
  – PT: 1 hour/week x 12 weeks
  – Home ex program 2x/day
  – Instruction on ADLS
  – Self management arthritis education reading + videotape
  – Medications (APAP, NSAIDs, hyaluronic acid injections)

• Arthroscopic surgery
  – Irrigation with saline
  – 1 or more of the following:
    • Debridement or excision of degenerative meniscus tears
    • Removal loose bodies, chondral flaps, bone spurs
  – Medical and physical therapy like controls


Results

Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis


Surgery vs PT for meniscal tear and OA

- Multicenter RCT
- 351 patients with meniscus tear + OA
- Meniscus sx (clicking, popping, catching, giving way, joint line pain, pain with twisting)
- Avg. age 60 years
- 50% men, 50% women
- Primary outcome = change in WOMAC physical-function score between groups at 6 mo

Interventions

- **Control (PT)**
  - Usually 6 weeks
  - 3-stage program
- **APAP, NSAIDs, intraarticular steroid injections as needed**

- **Arthroscopic partial meniscectomy (APM)**
  - Trim damaged meniscus back to stable rim
  - Remove loose cartilage and bone
- **PT protocol**
- **APAP, NSAIDs, intraarticular steroid injections as needed**


Results

Results


Conclusions

• 30% crossed over from PT to APM at 6mo
  – These people had WOMACs that didn’t improve until crossover
• No sig difference in adverse events
• PT and APM are reasonable options with similar outcomes for these patients (with allowed cross over if not achieving relief with PT)
• Starting with conservative approach is reasonable

Osteoarthritis with meniscus tear

- Meniscus tear is part of the natural history of osteoarthritis
- Treat as osteoarthritis initially
- Imaging: Start with x-ray, MRI if exam c/w meniscus tear and not improving with PT
- Consider arthroscopic meniscus surgery if PT, medications, injections not helping or if patient prefers surgical treatment

Caveats: Who to Refer

- Younger patients
- Bucket handle meniscus tears
  - Knee locked due to meniscus blocking joint movement
- Mechanical symptoms: locking, catching
- Failure of nonoperative knee OA treatment
3 excellent articles for Non-op knee OA treatment


Case #3

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

Rotator cuff disease in primary care

- The 3rd most frequent musculoskeletal reason patients present to the office
- The most common cause of shoulder pain in patients in the US primary care settings

What is rotator cuff disease?

• Impingement
• Tendinitis/tendinopathy
• Partial thickness tear
• Full thickness tear

Rotator cuff disease treatment

Most do well with conservative treatment

• Impingement
• Tendinitis, tendinopathy
• Partial tear
• Full thickness tear → Consider ortho referral.

PT +/− Injection +/− Medication
Rotator cuff surgery outcomes

Better if (acute) full thickness rotator cuff tears fixed earlier than later

- Smaller tear size associated with better outcome (Cofield RH et al. Surgical repair of chronic rotator cuff tears. JBJS 2001.)

- Less fatty infiltration and muscle atrophy associated with better outcome (Gladstone JN et al. Fatty infiltration and atrophy of the rotator cuff do not improve after rotator cuff repair and correlate with poor functional outcome. AJSM 2007.)

Shoulder: diagnosis driven exam

- Active ROM
  - Normal
  - Decreased

- Passive ROM
  - Normal
  - Decreased

- X-ray
  - Normal
  - Abnormal

- Frozen shoulder

- GH joint OA

- Other rotator cuff dz
  - Labral tear
  - Biceps tendinitis
  - AC joint OA

- Rotator cuff tear
Physical exam maneuvers that increase likelihood of rotator cuff disease

1. Painful arc
2. Drop arm test

Pain test: Painful arc

If painful, positive LR 3.7 for RCD. If not painful, negative LR 0.36 for RCD.

JAMA. Rational clinical exam: Does this patient have rotator cuff disease? Aug 2013.
Pain/strength test: Drop arm test

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

Positive LR 3.3, negative LR 0.82 for rotator cuff disease.

Physical exam maneuvers that increase likelihood of full thickness rotator cuff tear

1. External rotation lag test
2. Internal rotation lag test

https://www.healthbase.com/hb/images/cm/procedures/orthopedics/rotator_cuff_tear.jpg
Strength test:
External rotation lag test

Positive LR 7.2, Negative LR 0.57 for full thickness rotator cuff tear

Pain & Strength test:
Subscapularis = internal rotation lag test aka ‘lift off’

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.
Case #3

57 y/o RHD man presents with R shoulder pain that started after he fell 3 months ago. Pain at R deltid. He tried physical therapy without benefit. Waking at night from sleep due to pain. Exam: no atrophy. Nontender biceps, AC Joint. AROM symmetric bilaterally (forward flexion, external + internal rotation, abduction). (+) painful arc, (+) drop arm, (+) ER lag, (+) IR lag

Diagnosis

A. Adhesive capsulitis
B. Rotator cuff tear
C. Impingement syndrome
D. Glenohumeral joint osteoarthritis
Shoulder: diagnosis driven exam

Active ROM
- Normal
- Decreased

Passive ROM
- Normal
- Decreased

X-ray
- GH joint OA
  - Normal
  - Abnormal

Rotator cuff tear
Other rotator cuff dz
Labsral tear
Biceps tendinitis
AC joint OA

Treatment

A. Refer for surgical consult
B. Repeat trial of physical therapy, f/u 3 months.
C. Give NSAIDs and activity modification, f/u 3 months
D. Give subacromial injection, f/u 3 months
3 excellent shoulder articles


Thank you!

Carlin Senter, M.D.
Primary Care Sports Medicine
UCSF Internal Medicine and Orthopaedics