Sports Medicine Update

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Overview
- Quick approach to MSK problems
- Highlight common presentations
- Joint by joint
- Discuss basics of conservative and surgical management

Ankle Sprains

Symptoms
- Localized pain usually over the lateral aspect of the ankle
- Difficulty weight bearing, limping
- May feel unstable in the ankle

Physical Exam

LOOK
- Swelling/bruising laterally

FEEL
- Point of maximal tenderness usually ATF

MOVE
- Limited motion due to swelling

Special Tests Anterior Drawer Test

- Normal ~ 3 mm
- Foot in neutral position
- Fix tibia
- Draw calcaneus forward

Subtalar Tilt Test

- Foot in neutral position
- Fix tibia
- Draw calcaneus forward

Anterior Drawer Test

Subtalar Tilt Test
Subtalar Tilt test

Err… this looks funny

Grading Ankle Sprains

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<th>Grade</th>
<th>Drawer/Tilt Test results</th>
<th>Pathology</th>
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<td>Mild stretch with no instability</td>
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<td>Drawer lax, tilt with good end point</td>
<td>ATFL torn, CFL and PTFL intact</td>
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Ottawa Ankle Rules

- Inability to weight bear immediately and in the emergency / office (4 steps)
- Bone tenderness at the posterior edge of the medial or lateral malleolus (Ottawa Ankle Serret)
- Bone tenderness over the navicular or base of the fifth metatarsal (Ottawa Foot Serret)

Treatment of Ankle Sprains

Acute
- Rest or modified activities
- Ice, Compression, Elevation
- Crutches PRN
- Bracing (Grade 2 and 3)
- Early Motion is essential

Physical Therapy
- ROM
- Strengthening
- Stretching
- Proprioception / Balance exercises (i.e. Wobble Board)

Not Always Only a “Sprain”

Ligaments
- Subtalar joint sprain
- Sinus tarsi syndrome
- Syndesmotic sprain
- Deltoid sprain
- Lisfranc injury
- Tendons
- Posterior tibial tendon strain
- Peroneal tendon subluxation

Bone
- Osteochondral talus injury
- Lateral talar process fracture
- Posterior impingement (os trigonum)
- Fracture at the base of the fifth metatarsal
- Jones fracture
- Salter fracture (fibula)
- Ankle fractures

“High Ankle” Sprains

Mechanism
- Dorsiflexion, eversion injury
- Disruption of the Syndesmotic ligaments, most commonly the anterior tibiofibular ligament
- R/O Proximal fibular fracture

External Rotation Stress Test

- Fix tibia
- Foot in neutral
- Dorsiflex and externally rotate ankle

Squeeze test

- Hold leg at mid calf level
- Squeeze tibia and fibula together
- Pain located over anterior tibiofibular ligament area

Treatment for Syndesmosis Injury

Conservative
- Cast or walking boot
- Protected weightbearing with crutches must be painfree
- PT

Surgery
- May needs ORIF if unstable

Maisonneuve Fracture
**Acute Knee Swelling - Hemarthrosis**

ACL (almost 50% in children, >70% in adults)

Fracture (Patella, tibial plateau, Femoral supracondylar, Physeal)

Patellar dislocation

Unlikely meniscal lesions – usually happen a few hours later

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**Emergencies**

1. Neurovascular injury
2. Knee Dislocation
   - Associated with multiple ligament injuries (posterolateral corner)
   - High risk of popliteal artery injury
   - Needs arteriogram
3. Fractures (open, unstable)
4. Septic Arthritis

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**Urgent Orthopedic Referral**

- Fracture
- Multiple ligament injury – rule out dislocation
- "Locked Joint" - unable to fully extend the knee (OCD or Meniscal tear)
- Tumor

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**Anterior Cruciate Ligament (ACL) Tear**

**Mechanism**
- Landing from a jump, pivoting or decelerating suddenly
- Foot fixed, valgus stress

**Symptoms**
- Audible pop heard or felt
- Pain and tense swelling in minutes after injury

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**ACL physical exam**

**LOOK**
- Efusion (if acute)

**FEEL**
- "O’Donaghe’s Unhappy Triad" = Medial meniscus tear, MCL injury, ACL tear
- Lateral meniscus tears more common than medial
- Lateral joint line tender - femoral condyle bone bruise

**MOVE**
- Maybe limited due to effusion or other internal derangement

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**Special Tests ACL**

- Lachman’s test – test at 20° (Sens 81.8%, Spec 96.8%)
- Anterior drawer – test at 90° (Sens 40.9%, Spec 95.2%)
- Pivot shift (Sens 91.1%, Spec 98.4%)
**X-ray**
- Usually non-diagnostic
- Can help rule in or out injuries
- Segond fracture – avulsion over lateral tibial plateau

**MRI**
- Sens 94%, Spec 84% for ACL tear
- Fibers not seen in continuity
- Edema on T2 films
- PCL – kinked or Question mark sign

**Initial Treatment**
- Referral to Orthopaedics/Sports Medicine
- Consider bracing, crutches
- Begin early Physical Therapy
- Analgesia usually NSAIDs

**ACL Tear Treatment**
- Conservative
  - No reconstruction
  - Physical therapy
    - Hamstring strengthening
    - Proprioceptive training
  - ACL bracing controversial
  - Patient should be asymptomatic with ADL's
- Surgery
  - Reconstruction
  - Depends on activity demands
  - Reconstruction allows better return to sports
  - Reduce chance of symptomatic meniscal tear
  - Less giving way symptoms
  - Recovery ~ 6 months

**Meniscus Tear**
- Mechanism
  - Occurs after twisting injury or deep squat
  - Patient may not recall specific injury
- Symptoms
  - Catching
  - Medial or lateral knee pain
  - Usually posterior aspects of joint line
  - Swelling
- Special Tests: Meniscus

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<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tr>
<td>Joint line tender</td>
<td>50.0%</td>
<td>70.1%</td>
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<tr>
<td>Hyperflexion</td>
<td>50%</td>
<td>68.2%</td>
</tr>
<tr>
<td>Extension block</td>
<td>84.7%</td>
<td>43.79%</td>
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<tr>
<td>McMurray positive (Med)</td>
<td>28.75%</td>
<td>89.5%</td>
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X-ray

- May show joint space narrowing and early osteoarthritis changes
- Rule out loose bodies
- MRI for specific exam

Meniscal Tear Treatment

Conservative
- Often if degenerative tear in older patient
- Similar treatment to mild knee osteoarthritis
  - Analgesia
  - Physical therapy
  - General Leg Strengthening

Surgery
- Operate if internal derangement symptoms
- Meniscal repair if possible

Medial Collateral Ligament (MCL) Injury

Mechanism
- Valgus stress to partially flexed knee
- Blow to lateral leg

Symptoms
- Pain medially
- May feel unstable with valgus

Medial Collateral Ligament (MCL) Injury

Physical Exam
- Tender medially over MCL (often proximally)
- May lack ROM “pseudolocking”
- Valgus stress test

MCL Treatment

Conservative
- Analgesia
- Protected motion
  - +/- hinged brace
  - +/- crutches
- Early physical therapy

Surgery
- Rarely needs surgery

Posterior Cruciate Ligament (PCL) Injury

Mechanism
- Fall directly on knee with foot plantarflexed
- “Dashboard injury”

Rule out knee dislocation
**Posterior Cruciate Ligament (PCL) Injury**

**Physical Exam**
- Sag sign
- Posterior drawer test
- X-ray - often non-diagnostic

**MRI is test of choice**

**PCL Treatment**

**Conservative**
- Acute: hinged post-op brace in extension (0-10° flexion)
- Crutches
- Early physical therapy

**Surgery**
- May require surgery if complete Grade 3 tear and symptomatic
- Needs urgent surgery if lateral side is unstable → posterolateral corner injury

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**Shoulder Impingement Syndrome**

**Mechanism**
- Impingement under acromion with flexion and internal rotation of the shoulder
- Rotator cuff, subacromial bursa and biceps tendon

**Symptoms**
- Pain with:
  - Overhead activities
  - Sleep (Internal rotation)
  - Putting on a jacket

**Shoulder Pain Differential Diagnosis**

- Rotator cuff tendinopathy
- Rotator cuff tears
- SLAP Lesion
- Calcific tendinopathy
- "Frozen" shoulder (adhesive capsulitis)
- Acromioclavicular joint problems
- Scapular weakness
- Cervical radiculopathy

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**Shoulder Impingement Syndrome**

**LOOK**
- May have posterior shoulder atrophy if chronic or RC tear
- Poor posture

**FEEL**
- Tender over anterolateral shoulder structures

**MOVE**
- May lack full active ROM

**Shoulder Impingement Syndrome**

Rotator Cuff strength testing
- Supraspinatus - Empty can/ Full can
Shoulder Impingement Syndrome

Rotator Cuff strength testing
- Supraspinatus - Empty can/ Full can
- Infraspinatus/teres minor - External rotation
- Subscapularis – Internal rotation / Lift-off test
- Weakness suggests tear

Impingement Signs

- Neer
- Hawkin’s
- Spurling’s test for cervical radiculopathy

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Impingement Signs

- Neer
- Hawkin’s
- Spurling’s test for cervical radiculopathy
- Shoulder problems do not give patients numbness and tingling!!

X-ray AP Scapula

- Avulsion
- Calcific tendinosis
- Enthesopathy (traction spurs)
- Alignment
- Arthritis
X-ray AC Joint view

- Osteoarthritis
- Osteolysis

X-ray Lateral Scapula

Normal
Large acromial spur

X-ray Axillary View

- Position
- Posterior dislocation

MRI

- MRI not needed for conservative treatment
- Use it to rule out significant pathology
  How good for full thickness rotator cuff tears?
- 69 to 100 percent sensitive
- 88 to 100 percent specific

SIS Treatment

Conservative
- Education
- Modify Activities
- Alter Biomechanics / Decrease tendon load
- Ice/NSAIDs (no evidence)
- Eccentric exercise programs
- Steroid injection
  - slightly better than placebo (Cochrane Database, 2004)

Surgery
- If patient fails conservative treatment for > 6-12 months
- If full thickness rotator cuff tear
  - Subacromial decompression
  - +/- bursectomy
  - +/- rotator cuff repair

Rotator Cuff Tears
**Surgical Management**
- Open
- Mini-open
- Arthroscopic
- Debridement

Large tears don’t do well.
Early fixation of small full-thickness rotator cuff tears.

**Adhesive Capsulitis / Frozen Shoulder**

**Mechanism**
- Unknown
- ?autoimmune
- May have history of diabetes, hypothyroidism, rheumatoid arthritis

**Symptoms**
- Usually 40-60 years
- Female > male
- Stiff
- Pain with extremes of ROM

**Diagnosis**

**Physical Exam**
- Limited range of motion → usually lose Internal rotation, external rotation, abduction and flexion

**Investigations**
- X-ray, Ultrasound, MRI usually non-diagnostic

**Adhesive Capsulitis Treatment**

**Conservative**
- Education and reassurance
- May take 24 months to unthaw
- Physical therapy
- Glenohumeral injection +/- capsular distension

**Surgery (rarely)**
- Exam and manipulation under anesthesia
- Arthroscopic release

**Shoulder Dislocations**

- Most commonly dislocated joint
- Sports or traumatic event

**Glenohumeral Dislocation**
- 90% of the dislocation is to the front
- Rarely dislocation is to the back
- Most commonly missed dislocation in ER-posterior
Rarely to the back!

Shoulder “Dislocation”

History
- Fall on outstretched hand
- Hit with arm in abduction
- Shoulder “came out”
- Reduced spontaneously or in the ER

Symptoms
- “Dead arm” (due to traction on brachial plexus)
- Pain anteriorly
- Limited motion

Diagnosis

Physical Exam
- Tender anterior shoulder
- May have decreased sensation to arm patch (axillary nerve)
- Apprehension test
- Sulcus sign (MDI)

X-ray and MRI

Hill Sachs Lesion – compression fracture of posterior humerus
Bankart Lesion – Avulsion of capsular attachment to the glenoid

Complications after Dislocation

Acute rotator cuff tear
- 40 to 60% incidence in patients > 40 years old
- Frozen shoulder
- Older the patient the stiffer they get
  - mobilize early within 2-3 weeks

Recurrent dislocation
- >90% recurrence < 20 years; 14% > 40 yrs
- Early surgical stabilization still controversial

Initial Treatment

- Sling x 2-4 weeks with pendulum exercises
- Early physical therapy
- Modification of activities
- Recurrent dislocation
  - Surgical stabilization
Concussion

- Defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces
- Due to a direct or glancing impact to the head
- Acceleration and deceleration causes shear and strain forces on the brain

Acute Presentation

Typical Symptoms
- Headache
- Nausea
- Dizziness
- Ringing in the ears
- Blurry vision

Severe Symptoms
- Persistent memory loss (amnesia)
- Slurred speech
- Post-traumatic seizure
- Breathing irregularity

Cognitive Presentation

Early Symptoms
- Confusion
- Amnesia
- Loss of consciousness
- Disorientation

Delayed Symptoms
- Sleepiness
- Sleep disturbance
- Feeling “slow”
- Fatigue

Symptoms may be delayed

Physical Examination

- Clear C-spine
- Rule out soft tissue and bony injury to head
- Neurologic Exam should be normal
- Mental status testing
  - Orientation
  - Concentration (numbers backwards)
  - Short and long term memory

Diagnostic Imaging

- Skull X-ray for fracture
- C-spine films
- CT
  - Extracranial injury
  - Abnormal Glasgow Coma Scale
  - Penetrating trauma
  - Declining LOC, breathing irregularity, post-traumatic seizure
- MRI
Grading Concussions

- Previous grading no longer recommended
- Controversial
- At least 16 published head injury grading and return to play systems exist
- All based on limited scientific evidence
- Simple concussions – resolve in 7 to 10 days
- Complex concussions – symptoms persistent, prolonged LOC or cognitive symptoms

Return to Play

- Athletes should be completely asymptomatic with rest and activities
- A player should not be returned to practice or play on the same day after a concussion
- May train gradually when asymptomatic with non-contact conditioning activities
- Consider Neuropsych testing
- Return to sport should be made by a physician


Refer to the specialist!

Can the athlete play safely?

Thank you