Sports Shoulder and Elbow Injuries

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Outline

- General diagnostic groups
- Physical exam
- Imaging
- Making the diagnosis
- Treatment plans

General diagnostic groups

- 13-20 YO
  - Instability
- 20-40 YO
  - Instability
  - Biceps/Labral Complex
  - Frozen Shoulder
- 40-60 YO
  - Rotator cuff
  - Frozen shoulder

Physical Examination

- Visual Inspection
- Active (passive) ROM
  - Elevation
  - ER
  - IR
  - ER at 90 degrees
  - IR at 90 degrees
- Strength
  - ER at side – infraspinatus
  - Empty can – supraspinatus
  - IR (bear hug) – subscapularis
Imaging

- X-ray (for me: on everyone)
  - Arthritis
  - Fracture
  - Dislocation (axillary view)
- MRI
  - To differentiate partial from full rotator cuff tear
- CT scan
  - To assess fractures, and for bone loss
- Ultrasound
  - Emerging technology

Instability (13-40)

- Predominantly patient reported
- Traumatic vs. Atraumatic
  - Traumatic – surgical referral
  - Atraumatic – attempt a course of physical therapy
    - Rotator cuff strengthening, scapular stabilization

Arthroscopic Techniques

Multiple dislocations
Multiple dislocations

Latarjet (Coracoid Transfer)

Biceps/Labral Complex (20-40 YO)

- Most challenging diagnosis to make
- Vague shoulder pain, worse with overhead activity
- Catching, locking, clunking
- Physical exam
  - Dynamic labral shear test
  - O’Brien’s test
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**Biceps/Labral Complex (20-40 YO)**

- Treatment
  - Physical therapy (6 weeks – 3 months)
    - Rotator cuff strengthening
    - Scapular stabilization
  - Nonoperative Treatment of Superior Labrum Anterior Posterior Tears
  - Improvements in Pain, Function, and Quality of Life
  - Biceps/Labral Complex (20-40 YO)

- Roughly 50% successful (didn’t have surgery)

**Biceps/Labral Complex (20-40 YO)**

- Surgical treatment
  - Biceps tenodesis

  Arthroscopic Supraspinal and Open Subspinal Biceps Tenodesis

  A Comparison of Minimum 2-Year Clinical Outcomes

  - Outstanding clinical outcomes
  - Low complication rate

Frozen Shoulder (20-60 YO)

- Limited active and passive ROM of the shoulder
- Excludes other diagnoses
  - Fracture
  - Dislocation
  - Arthritis
- Two categories:
  - Atraumatic
  - Posttraumatic (including surgery)
- Risk factors: Diabetes, Thyroid disease
- Most sensitive test: IR at 90 degrees

Treatment:
- Physical therapy
- Home stretching program
- Glenohumeral injection (corticosteroid, US guided)

Accuracy of glenohumeral joint injections: comparing approach and experience of provider

Allison Teleda, MD,*†; Chad Cook, PT, PhD, MBA†; Kyle J. Cassaa, MD,*
Richard J. Harkess, MD; Jeffrey B. Wieske, MD; Stefan Talia, MD;* Michael J. Klessenberth, MD

45-60% accuracy for experienced provider doing blind intraarticular shoulder injection

Frozen Shoulder (20-60 YO)

- Surgery for:
  - Posttraumatic frozen shoulder
  - Failure to resolve with 3-6 months of stretching and U/S guided injection

Rotator cuff tear (40-?)

- Deltoid based shoulder pain
- Pain with overhead activities
- Pain at night
- Testing:
  - Xrays generally normal
  - Empty can testing (supraspinatus)
  - Subscap/infraspinatus testing +/-
  - May have loss of active motion
  - Should have preserved passive ROM

Rotator cuff tear (40-?)

- Chronic OR Acute (injury)

Rotator cuff tear (40-?)

- Chronic OR Acute (injury)
- Partial thickness OR Full thickness
Rotator cuff tear (40-?)

<table>
<thead>
<tr>
<th>Chronic</th>
<th>OR</th>
<th>Acute (injury)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial thickness</td>
<td>OR</td>
<td>Full thickness</td>
</tr>
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</table>

Urgent surgical referral

My algorithm

Rotator cuff tear (40-?)

Chronic tear

Physical therapy (6 weeks)
Rotator cuff tear (40-?)

Chronic tear

Physical therapy (6 weeks)
- Home program, cuff strengthening
- MRI for failure
- Partial vs full tear

My algorithm

Physical therapy (6 weeks)
- Home program, cuff strengthening
- MRI for failure
- Partial vs full tear

Injection
Rotator cuff tear (40-?)

**Chronic tear**

- Physical therapy (6 weeks)
  - Home program, cuff strengthening

**MRI for failure**

- Partial
  - Partial vs full tear
- Full
  - Surgical Referral

**Injection**

Rotator cuff tear (40-?)

**Acute tear**

- MRI
Rotator cuff tear (40-?)

Acute tear

MRI

• Partial vs. full tear

My algorithm

Rotator cuff tear (40-?)

Acute tear

MRI

• Partial vs. full tear

PT (6 weeks)

Steroids?

The timing of elective shoulder surgery after shoulder injection affects postoperative infection risk in Medicare patients

Brian C. Werner, MD, Jourdan H. Cancienne, MD, M. Tyrrell Burrell, MD, Justin W. Griffin, MD, F. Winston Gwathmey, MD, Stephen F. Brockmeier, MD*†

Department of Orthopaedic Surgery, University of Virginia Health System, Charlottesville, VA, USA


• There was a substantially increased risk of postoperative infection in patients who had an injection within 3 months of surgery
  • OR: 1.6 (arthroscopy), 2.0 (arthroplasty)

PT (6 weeks)

Surgical Referral

Full

Partially

Partially
**Rotator cuff repair**

- For acute full thickness tears
- For chronic tears, acute partial tears that fail nonoperative management (PT +/- one injection)

**Elbow**

**Diagnostic Groups**

<table>
<thead>
<tr>
<th>Tendon</th>
<th>Lateral Epicondylitis</th>
<th>Medial Epicondylitis</th>
<th>Biceps Rupture</th>
<th>Triceps Rupture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nerve</td>
<td>Ulnar Nerve</td>
<td>Radial Tunnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint</td>
<td>Arthritis</td>
<td>Loose Body</td>
<td>Osteophytes</td>
<td></td>
</tr>
<tr>
<td>Trauma</td>
<td>Radial head fracture</td>
<td>Olecranon fracture</td>
<td>Fracture/Dislocation</td>
<td></td>
</tr>
<tr>
<td>Thrower</td>
<td>UCL Injury (Medial tension)</td>
<td>Lateral Compression</td>
<td>Extension overload</td>
<td></td>
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</tbody>
</table>

**Tendon Lateral epicondylitis**

- Natural history: self limited
- Pain with resisted wrist/middle finger extension

- PT/OT Counterforce bracing
- Activity modification
- US guided PRP Injection
- Needle Tenotomy
- Tenex
- Surgical debridement/Repair
Steroid?

Systematic review of randomized controlled trials
- 6 weeks – Better with steroid injection
- 1 year – Better with physical therapy

PRP?

Systematic review of randomized controlled trials
- 12 weeks – No difference
- 24 weeks – Better with PRP

Tendon Lateral epicondylitis

Natural history: self limited

PT/OT
- Counterforce bracing
- Activity modification

U/S guided PRP Injection Needle Tenotomy Tenex

Surgical debridement/ Repair

Tendon Biceps tendon rupture

Inspection: Deformity and ecchymosis
- Palpation: Absent distal biceps tendon
- Special testing:
  - Hook test
  - Resisted supination (weak ± pain)
- Natural history:
  - 40-50% supination strength loss
  - 30% flexion strength loss

Urgent referral
- Best if repaired within about 4 weeks

http://ajs.sagepub.com/content/35/11/1865/F3.expansion
Phases of Throwing

- Wind up
- Cocking
- Acceleration
- Deceleration
- Follow-through
Medial Tension – UCL Injury

• Uncommon in skeletally immature, much more common in older athletes
• Acute or chronic attritional rupture
• Moving valgus stress test is best test to evaluate


UCL Reconstruction - Evolution

<table>
<thead>
<tr>
<th>Method</th>
<th>RTP Rate</th>
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<tbody>
<tr>
<td>Jobe Technique</td>
<td>63%</td>
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<tr>
<td>ASMI Technique</td>
<td>78%</td>
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<tr>
<td>HSS</td>
<td>97%</td>
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</tbody>
</table>


Medial Tension – UCL Injury

- Rehab:
  - Immobilization x 7-10 days
  - Hinged elbow brace – AROM shoulder/elbow
  - Gentle strengthening exercises when pain subsides
  - Valgus stress avoided until 4 months
  - At 4 months, begin throwing program
  - Return to play at approximately 10-12 months

Conclusion

- Most shoulder and elbow pathology falls into a small group of diagnoses
- Evaluation of patient age, history, and exam will help effectively guide patients to appropriate management
- Shoulder and elbow surgery have evolved rapidly, including with arthroscopic techniques, leading to excellent outcomes