Learning Objectives

• SLAP tears – diagnosis, imaging and treatment
• How to diagnose rotator cuff tears
• Understand the recovery after a rotator cuff repair
• How to differentiate between frozen shoulder and rotator cuff tears
• Proximal Biceps tears
SLAP Tears

• Superior Labral Anterior Posterior
• What is normal?
• What is pathologic?
SLAP Tears

- Sublabal foramen or Meniscoid labrum
- Buford Complex
- Normal variants that should not be repaired because it will lead to stiffness
SLAP Tear

- Incidence of SLAP tears
- Sublabral foramen 20%
- Buford complex 5-10%
- 544 arthroscopy procedures (24%)
- Asymptomatic Pitcher (89%)
SLAP H&P

- Anterior or posterior shoulder pain
- Can radiate along the biceps
- Mechanisms of injury: Impact of the humeral head into the joint
  Traction injury or Repetitive use.

- Obrien test
- Kim test
- Odriscoll test
- Many original studies show high sen/spec but in clinical practice no test is great because other pathologies cause pain with these tests
SLAP Tear Imaging

- MRI vs MRI Arthrograms

- My algorithm is not to use contrast. If normal and fails therapy or injections, then MRA.


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<tr>
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<th>MRA</th>
<th>MRI</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>80%</td>
<td>63%</td>
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<tr>
<td>Specificity</td>
<td>91%</td>
<td>87%</td>
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SLAP Treatment

- Physical Therapy
- Intra-articular cortisone injections
- 75% success rate of treatment with conservative care
SLAP Surgery

• Repair
  – Adhesive capsulitis
  – They don’t always heal
  – Complications from anchors or knots

• Debridement (type 1)

• Biceps tenodesis
  – Remove deforming force


• Debridement and or biceps tenodesis was favored treatment because of the complications and failures of slap repairs.

• Older than 40 and workers compensation were independent risk factors for failure.
Impingement – Partial tear – Complete tear

- These terms describe the different time points that occur with tendinopathy of the rotator cuff.
- Tendinopathy starts with degeneration of the collagen within the tendon.
- This can occur due to extrinsic or intrinsic causes.
Extrinsic Factors

- Acromial spurs
- Lateralized acromion
- Acromioal morphology


Intrinsic factors

- Healing mechanism within the tendon is overwhelmed
- Haphazard proliferation of tenocytes
- Intracellular abnormalities
- Disruption of collagen fibers
- Mucoid degeneration
- Minimal inflammation
Genetic Risk for Cuff Tears

- Harvie et al identified that siblings had a 2.42 relative risk for a rotator cuff tear.
- Robert Tashjian et al in patients under 40, second and third degree relatives had 3.66 increased RR.
Impingement Syndrome

• What is it?
  – Rotator cuff tendonitis
  – Bone spur
  – Bursitis

• Causes
  – Age
  – Repetitive use
  – Injury
Diagnosis of Impingement

- History
- Often atraumatic
- Localized to the side of the shoulder, anterior and sometime posterior
- Occasional radiation to the fingers
- Night pain
Diagnosis of Impingement

• Exam

• Normal motion or slight loss of elevation or internal rotation

• Tender over the anterior acromion or greater tuberosity

• + impingement sign
Impingement test

- Abduct the arm 90 degrees
- Start with the arm externally rotated
- Internally rotate the arm
- If pain is generated with the arm internally rotated, then it is a positive test.
Diagnosis of Impingement

- MRI can be obtained if x-rays normal and no improvement with therapy for 6 weeks
- Subacromial bursitis can help confirm the diagnosis and rule out other pathology
- Injection test is another way to confirm the diagnosis
MRI Guidelines

- Designed to limit MRIs
- Most common overuse is sudden onset of shoulder pain
- Infection, tumor, loose body, acute cuff tear, dislocation – early MRI
- Most others require PT or home therapy for 6 weeks.
Treatment of Impingement

- Physical therapy
  - Treat muscle deconditioning
  - Scapula mechanics

- Injections
  - Cortisone can help relieve pain to allow patients to perform pt
  - Block inflammatory mediators

- Surgery
Subacromial Injection
### How accurate are we?

<table>
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<tr>
<th>Joint</th>
<th>Ultrasound</th>
<th>Landmark guided</th>
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<tbody>
<tr>
<td>AC joint</td>
<td>93%</td>
<td>68%</td>
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<tr>
<td>Subacromial</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>Biceps</td>
<td>87%</td>
<td>27%</td>
</tr>
<tr>
<td>GH joint</td>
<td>93%</td>
<td>73%</td>
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Ultrasound-guided shoulder girdle injections are more accurate and more effective than landmark-guided injections: a systematic review and meta-analysis. Br J Sport Med 2015 Aly, Rajasekaran, and Ashworth
Surgery for Impingement

- Indications- Failure of conservative tx for at least 3 months and positive injection test
- Removal of bone spur
- Removal of bursa
- Common additional surgery
  - AC joint resection
  - Biceps tenodesis
  - SLAP repair
  - Release of adhesions
  - Should not change recovery timeline
Recovery from Impingement

- 6 months for non-operative treatment
- Surgery
  - Off work first 2-6 weeks
  - Start home therapy day 1
  - Start formal therapy at 2-6 weeks
- 3 months to elevate the arm with minimal pain
- 6 months to lift 10-20 lbs overhead
- Will need work hardening for heavy activity occupation and will need one year for full recovery
Surgery Results

- Patients are asked about their pain on a scale of 0-10 at rest, during normal activity and vigorous activity. A score of 30 means no pain.
Surgery Results

- Satisfaction is based on a scale of 0-10
Surgery Results

• The function score is made from 20 questions. Patients answer each question on a scale of 0-3. Patients who can do all functions normally get a score of 60.
Road Blocks to Recovery of Impingement

• Type of job
  – Desk work
  – Repetitive work
  – Overhead lifting

• Patient factors
  – Secondary gain
  – Social situation
  – Other medical conditions
Rotator Cuff Tears

- History: may be gradual onset or acute from trauma
- Lateral arm pain
- Weakness
- Popping
- Night pain
- Exam: weakness with external rotation, painful arc, drop arm sign (91% predictive of a cuff tear)

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Rotator cuff strength

- Ask the patient to hold the arms parallel to the floor
- Then push the arms towards the floor
- Ask the patient to resist internal rotation
- Always compare to the opposite side.
Acute Rotator cuff tears

- History: Trauma
- Exam: Weakness to ext rotation, drop arm sign, painful arc, unable to elevate above 90
- MRI: request early.
- If unsure because of pain and swelling after injury, OK to re-examine in 2 weeks, just don’t wait 6+ weeks
Acute Tears

- Easier to repair because the tendon and muscle have less stiffness
- Muscle atrophy can occur and it is irreversible

The mean volume change in chronically detached infraspinatus muscle over time as determined from magnetic resonance imaging scans and image analysis.

Treatment of Rotator cuff Tears

- Surgical repair is best for full thickness tears, after an acute injury, without muscle atrophy, in young patients who do not smoke or have medical problems
Chronic Cuff Tears

- Physical Therapy
- Injections
- Fatty infiltration is not reversible
Results of Surgical repair

- 10%-90% of repairs are intact at one year
- 90% of patients have pain relief.
- Some function well even if the tear doesn’t heal.
- Depends on overhead workload and amount of reaching
Rotator Cuff Repair

Satisfaction

Pain

Function

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Cuff Repair Recovery

- Minimum 6 months
- 6 weeks in a sling
- Must wait 12 weeks for strengthening.
- Can take up to a year for younger more active patients or any L&I patient.
Frozen Shoulder

• History
  – Starts with insignificant trauma
  – Days later, pain starts
  – Then the shoulder becomes stiff
  – Pain with sleep and overhead motion

• Exam
  – Passive motion is the same as active motion
  – Both are limited, especially ext rotation

• Get an xray to rule out arthritis or other pathology that could cause a mechanical loss of motion
Frozen Shoulder

- **Treatment**
  - Home stretching program
  - Brevity, Intensity, Consistency
  - Reassure patients that it is normal to have stiffness and pain for 6-9 months

- **When to refer**
  - When patient stretching stops yielding more motion.
  - Should wait a minimum of 8 weeks after freezing stage
AC joint arthritis

- **History:** Pain on the top of the shoulder, worse with reaching to the opposite shoulder
- **Exam:** tender over the ac joint, pain over the ac joint with cross arm adduction
AC joint Arthritis

- Xrays: AP of the shoulder
- MRI: edema at the distal clavicle, severity of arthritis looks worse on MRI, often shows spur over the supraspinatus
AC Joint Arthritis

- Treatment
- AC joint injections
- Therapy
- Surgery if injection test positive and activity modification and therapy does not help.
Proximal Biceps Tear

- Sudden onset of pain
- Ecchymosis over the biceps groove
- Deformity
- May have been preceded with shoulder symptoms
Proximal Biceps Tear

• Check Subscapularis function with liftoff or belly press
• If cuff strength is ok, then rest, reassurance and therapy is appropriate
• I offer surgery to patients who lift often like UPS driver to minimize risk of cramping
Which scenario warrants early MRI?

• 50 yo dislocates the shoulder and has weakness
• 70 yo falls on outstretched hand and has pain during elevation to 150 degrees.
• 15 yo with shoulder pain and destructive lesion on x-ray
• 60 yo wakes up with sudden shoulder pain and active elevation 90 degrees and passive elevation 100 degrees
Which patient has a rotator cuff tear?

- 40 yo is rear ended one week ago. Active external rotation is 20 and passive is 20.
- 30 yo wakes up with sudden shoulder pain 9/10 and x-rays show a calcium deposit on the side of the humeral head.
- 60 yo starts a lawnmower and has sudden pain with inability to tuck in his shirt.
- 70 yo carpenter with 3 months of shoulder pain, + painful arc, weakness to ext rotation and drop arm sign.
What is the healing rate of a 2 cm rotator cuff tear?

- 10%
- 25%
- 50%
- 80%
- 95%
What is the minimum recovery time for a rotator cuff repair?

• 2 months
• 4 months
• 6 months
• 8 months
• 12 months
Which condition will worsen and lead to poor function if surgical treatment is delayed?

- Impingement syndrome
- Rotator Cuff tear
- AC joint arthritis
- SLAP tear
- Proximal Biceps tear
- Glenohumeral arthritis
- Frozen Shoulder
Remember, when things look bad
They could be worse...
Thank you.