COMMON PROBLEMS OF THE SHOULDER, EXAMINATION AND OMT

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Objectives

• At the conclusion of this lecture, the attendee should be able to:

- Identify basic anatomic landmarks of the shoulder
- Identify typical patient symptoms/complaints
- Differentiate various medical diagnoses of the shoulder
- Perform & understand the indications of specific shoulder tests
- Identify various diagnostic and treatment modalities
- Perform various OMT techniques for shoulder dysfunctions
Pre-Test Question #1

1) Which nerve is most commonly injured with a gleno-humeral shoulder dislocation?

a) Axillary Nerve  
b) Suprascapular Nerve  
c) Musculo-cutaneous Nerve  
d) Radial Nerve  
c) Ulnar Nerve

Answer: A) Axillary Nerve
Pre-Test Question #2

2) How many ligaments make up the Coraco-clavicular Ligament?

a) One
b) Two
c) Three
d) Four
c) Five

Answer: B) Two

*The Conoid and Trapezoid Ligaments*
3) Which of the following tests is used to evaluate for Bicipital Tendonitis?

a) Jobe
b) Apprehension
c) Hawkins’
d) Apleys
e) Speeds

Answer: E) Speeds
Pre-Test Question #4

4) How many muscles either attach or originate on the Scapula?

   a) 7
   b) 10
   c) 15
   d) 17
   e) 21

Answer: D) 17
Muscles attaching to or originating on the Scapula

- Serratus Anterior
- Supraspinatus
- Subscapularis
- Trapezius
- Teres Major
- Teres Minor
- Triceps Brachii (long head)
- Biceps Brachii (short & long heads)
- Rhomboid Major
- Rhomboid Minor
- Coracobrachialis
- Omohyoid (inferior belly)
- Latissimus Dorsi
- Deltoid
- Levator Scapula
- Infraspinatus
- Pectoralis Minor
Pre-Test Question #5

5) What is the name of the (true AP) radiographic view that is taken in the plane of the scapula (30-45° medial to lateral)

a) Scapular Y
b) Swimmers
c) Zanca
d) Serendipity
e) Grashey

Answer: E) Grashey

a) Scapular Y – Lateral view for dislocations
b) Swimmers – Lateral view for better visualization of C7-T3
c) Zanca – AP view with Cephalic tilt to view AC joint
d) Serendipity – 40° Cephalic tilt to view SC joint
Pre-Test Question #6

6) Which of the following Osteopathic Manipulative Medicine Techniques will work best at improving ROM of the Glenohumeral Joint?

a) Miller Pump
b) Dalrymple Pump
c) Spencers Technique
d) AC Joint Counterstrain
e) Myofascial Release of the Scapulothoracic Joint

Answer: C) Spencers Technique
History and Physical Exam are Key

- Is this problem Acute or Chronic (> 3 mos)?
- Was there a History of Trauma/MOI or did it come on slowly?
- Has this problem occurred before?
- What activities exacerbate the symptoms?
- Does the pain radiate from any other area?
- Does this prevent you from doing certain things?
- Are the symptoms getting worse?
- What alleviates the symptoms?
- On a pain scale 1-10, how severe is your pain now and what is it at it’s worst?
- Have you seen anyone else for this problem before?
- Have you tried anything to self treat or done anything at the advice of another physician?
Anterior Shoulder

- Acromioclavicular joint
- Acromion
- Subacromial bursa
- Supraspinatus tendon
- Glenohumeral joint
- Bicipital tendon
- Subscapularis tendon
- Biceps muscle (long head)
- Coracoid process
- Clavicle
- Sternoclavicular joint
- Scapula
- Sternum
Lateral Shoulder

- Biceps tendon (longhead)
- Acromion
- Supraspinatus muscle
- Glenoid fossa
- Infraspinatus muscle
- Teres minor muscle
- Scapula
- Acromioclavicular joint
- Clavicle
- Coracoid process
- Glenohumeral ligaments:
  - Superior
  - Middle
  - Inferior
- Subscapularis muscle
Acute vs Chronic

• Triggered by Trauma:
  - Dislocation of Humeral Head from Glenoid Fossa
  - Fracture to the Humerus/Clavicle/Scapula
  - Sprain/Strain: AC Joint Injury or Traumatic Rotator Cuff Tear

• Slow and Progressive (Repetitive Trauma/Overuse):
  - Sub-acromial Impingement
  - Bursitis
  - Tendinitis: Bicipital, Rotator Cuff

Progressing to Adhesive Capsulitis???
Acromion Types

- Type I – {FLAT} least likely to cause impingement
- Type II – {CURVED} more likely to cause impingement
- Type III – {BEAKED} most likely to cause impingement, usually requires surgical debridement prior to rehabilitation
- *Subacromial impingement of the Supraspinatus with overhead activities*
Gross Shoulder Anatomy Landmarks

- Clavicular head of pectoralis major
- Clavicular part of deltoid
- Deltopectoral groove (for cephalic vein)
- Anterior axillary fold
- Posterior axillary fold
- Sternocleidomastoid
- Clavicle
- Jugular notch
- Descending (superior) part of trapezius
- Infraclavicular fossa (overlying clavipectoral triangle)
- Axillary fossa
- Sternochastal head of pectoralis major
- Digitations of serratus anterior
Functional Shoulder Articulations

**Structural**
- Thoracic cage
- Scapula
- Clavicle
- Humerus

**Functional**
- Scapulothoracic
- Acromioclavicular
- Sternoclavicular
- Glenohumeral

Hoppenfeld
Common Ailments of the Shoulder

- Tendonitis (Supraspinatus, Biceps)
- Bursitis (Sub-acromial)
- Dislocation/Subluxation (Gleno-humeral)
- Sprain (AC Joint)
- Strain/Tear (Rotator Cuff – SITS muscles, Biceps tendon)
- Osteoarthritis (AC Joint)
- Fracture (Clavicular, Scapular, Humeral)
- * Adhesive Capsulitis

*Rule out Cervical Radiculopathy with Spurling’s maneuver and Neurologic Examination: DTRs, Sensory Testing, and Motor Strength*
Case #1

- 54 yo female environmental engineer presents for re-evaluation of right shoulder pain x 1 week after falling on the same shoulder. She was initially seen in the ER and x-rays were negative, she was sent home with a sling. Pain has become progressively worse and she now has limited ROM in all planes (sling use x 1 week). No prior injury or shoulder issues reported. She has been taking Cataflam with limited relief. Pain 7/10 on pain scale.
- Exam is very limited due to pain
- Suspected Frozen Shoulder 2/2 trauma
- CS injection done of the sub-acromial space
- Slight improvement of pain, 5/10, and handout given w/instructions for ROM exercises and advised discontinued use of sling
Case #1 Continued

• Patient returns in one week with little to no improved pain and continued very limited ROM and limited exam 2/2 guarding.

• MRI performed demonstrating
  • Massive full thickness tear of the supraspinatus, infraspinatus and subscapularis muscles, also the biceps tendon is not seen and appears completely torn

• Surgery referral place

• * Review of history showing Poorly controlled asthma and taking Prednisone 20 mg daily

• **No OMT done in this case
Frozen Shoulder

• Adhesive Capsulitis - refers to a stiffened GH joint that has lost significant ROM
  - shoulder motion is more scapulothoracic than GH
  - **persistent dull ache**, unable to lift arm above head or internally rotate GH joint
  - Due to lack of use from shoulder pain, **mcc rotator cuff tendinopathy**

• Tx: OMT, Physical Therapy and Pain Relief (NSAIDs), CS injections
  * Consider MUA if not better in 6-18 mos
Rotator Cuff Muscles

<table>
<thead>
<tr>
<th>Rotator Cuff Muscles</th>
<th>Proximal Attachment of Scapula</th>
<th>Distal Attachment on Humerus</th>
<th>Innervations</th>
<th>Muscle Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supraspinatus</td>
<td>Supraspinous fossa</td>
<td>Superior facet of greater tubercle</td>
<td>Suprascapular N (C4, C5, C6)</td>
<td>Initiates &amp; assists deltoid in ABDuction</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>Infraspinous fossa</td>
<td>Middle facet of greater tubercle</td>
<td>Suprascapular N (C5, C6)</td>
<td>External (laterally) rotation</td>
</tr>
<tr>
<td>Teres Minor</td>
<td>Middle part of lateral border</td>
<td>Inferior facet of greater tubercle</td>
<td>Axillary N (C5, C6)</td>
<td>External (laterally) rotation</td>
</tr>
<tr>
<td>Subscapularis</td>
<td>Subscapular fossa (most of the anterior surface)</td>
<td>Lesser tubercle</td>
<td>Upper &amp; lower subscapular N (C5, C6, C7)</td>
<td>Internal (medially) rotation</td>
</tr>
</tbody>
</table>
Rotator Cuff Muscles

- Remember {SITS}
- Stabilizes humeral head in glenoid fossa along with many ligaments

- **Supraspinatus** – mc tear, attaches to the greater tubercle of the superior-lateral humeral head
  * Mainly involved w/ ABduction
- **Infraspinatus** – attaches to the greater tubercle and Externally Rotates Arm
- **Teres Minor** - attaches to the greater tubercle and Externally Rotates Arm
- **Subscapularis** – attaches to the lesser tubercle and Internally Rotates Arm

* Pain commonly radiates to the Deltoid insertion with rotator cuff pathology
Reference Material:
Upper Extremity Muscles with Motion at the Gleno-humeral Joint

- **Flexors**
  - Deltoid (anterior)
  - Coracobrachialis
  - Pectoralis major
  - Biceps

- **Abductors**
  - Deltoid (midportion)
  - Supraspinatus
  - Serratus anterior

- **Adductors**
  - Pectoralis major
  - Latissimus dorsi
  - Teres minor
  - Deltoid (anterior)

- **Extensors**
  - Latissimus dorsi
  - Teres major
  - Deltoid (posterior)
  - Triceps

- **External Rotators (Lateral Rotation)**
  - Infraspinatus
  - Teres minor
  - Deltoid (posterior)

- **Internal Rotators (Medial Rotation)**
  - Subscapularis
  - Pectoralis major
  - Latissimus dorsi
  - Teres Major
  - Deltoid (anterior)
Case #2

- 51 yo male presents for evaluation of right shoulder/arm pain x 1 day. He helped a driver who had got stuck with his corvette on the beach. While lifting the back end and pushing the car, with the driver hitting the accelerator, he felt a snap in his shoulder and arm.
- He immediately feels pain and weakness in the right arm.
- Examination reveals weakness in his right arm, 4/5 with arm flexion (biceps)
- Tenderness to palpation of the bicipital tuberosity on the proximal radius
- Pain and weakness with Speeds test and Yergasons test
- Also noted, slight muscular deformity proximally
Case #2 Continued

- MRI performed confirming distal bicipital tendon rupture
- Surgery consulted
- No OMT performed
Bicipital Tendinitis

- Usually involves Long Head biceps tendon
- L.H. of Biceps tendon passes through the Bicipital Groove of the anterior humerus {Anterior Shoulder Pain}
  
  L.H. attaches to supraglenoid tubercle on humeral head  
  S.H. attaches to coracoid process of scapula

- Frequently seen w/ Rotator Cuff pathology
- Yergason’s Test – elbow flexed to 90° and wrist pronated, pt will attempt to externally rotate arm and supinate against resistance
- Speed’s Test – Arm Flexed up to 90° and continued Flexion against physician resistance

* (+) if pain in bicipital tendon or tendon slips out of bicipital groove (held in place by transverse humeral ligament)
**Speed’s Test**

- Testing for Bicipital tendonitis, (long head)
- Patient with Arm Flexed to 80-90° and Forearm Supinated
- Examiner Resists Forward Flexion from patient w/ downward force on patient’s wrist
- Pain in the anterior shoulder, site of biceps tendon, = + TEST

**Yergason’s Test**

Testing for Bicipital tendonitis, bicipital tendon subluxation

Patient with Arm Pronated and Elbow at 90°

Examiner resists and externally rotates arm while the patient supinates and externally rotate the arm against resistance, can add elbow flexion

Pain in the anterior shoulder, and/or subluxation of biceps tendon = + Test
Steps to perform Counterstrain (of the shoulder)

- Diagnose the somatic dysfunction by identifying significant tender points.
  - Test the regions and determine the worst.

- Position the patient to reduce the tenderness.
  - First stage: place the patient in the classic position.
  - Second stage: Fine tune three times to attempt to reduce tenderness to 0%.

- Quantify your results each time you position the patient:
  - assign the initial value of tenderness to 10 on a scale of 0-10
  - ask the patient how much tenderness is left on a scale of 0-10 each time you reposition
  - “If your original pain was a 10 on a scale of 0-10, what is it now on a scale of 0-10 when I press on it?”
Principles: Treatment

• While you hold the position of maximum comfort for a minimum of 90 seconds (120 sec. for ribs):
  • Remind the patient to relax.
  • Maintain your finger lightly on the tender point to:
    • Palpate/assess changes in the tender point
    • Re-assess the patient’s level of tenderness by pressing on the tender point and getting feedback after 30 seconds and after treatment
  • Assure your patient that you’re testing the same location
Principles: Treatment

- **Return the patient to the neutral position.** This must be done *very slowly* and totally passively (talk them out of the position).
  - "The only difference between the cause and the cure is the speed of return to the neutral position."

- Maintain your finger on the tender point while you return the patient to neutral.
Principles: Treatment

- In neutral position, **retest** the tender point for desired effect, i.e., resolution or significant reduction in tenderness.
  - reduction of pain to about 30% of the original tenderness level
  - Remaining tenderness of:
    - **3/10 on tenderness scale or 30% of original tenderness still present**
    - resolution of “jump sign”

Although some tenderness may be present, this is a significant reduction.
LH Biceps

- Tendon of the biceps muscle’s long head in the bicipital groove
- Flexion of elbow, flexion of shoulder
- Slight abduction
- Internal rotation of shoulder
- Patient should be lying comfortably in the supine position as seen below with their dorsal wrist/forearm placed on their forehead

LH Biceps
Case #3

- 49 yo female county office worker presents with h/o 3 months worsening right shoulder pain. Denies any specific trauma, but states pain came on after having a two week duration of shifting boxes/files in a storage area. She notes having difficulty with putting her bra strap on now, unable to talk on phone while holding phone on the right side. Pain is 9/10 on pain scale and responds somewhat to Naproxen. Pain resolves when the shoulder is being held still and not moving.
Special Tests

Apley Scratch Test

The positions at the upper left arm tests for external rotation and abduction of the shoulder. The patient reaches behind his or her head to attempt to touch the superior medial angle of the opposite scapula.

The positions at the lower left test for internal rotation and adduction of the shoulder. The patient reaches behind his back to touch the inferior angle of the opposite scapula.
Apley’s Scratch Test

Notice the limited internal rotation on the right side *
Normal ROM

- Flexion – 160-180 degrees
- Extension – 45 degrees
- Abduction – 160-180 degrees
- External Rotation – 45-90 degrees

- The Apley Scratch Test used to assess rotation of the shoulder joint. Patients with normal glenohumeral motion should be able to scratch the midback (T8 to T10 level)

*patients with glenohumeral osteoarthritis (or frozen shoulder and possibly acute rotator cuff tendinitis) have limited ROM when compared with the healthy arm
Normal Shoulder ROM

- Neutral flexion (N ≈ 150-170°)
- Neutral extension (N ≈ 40°)
- Neutral external rotation (N ≈ 60°)
- Neutral internal rotation stage 1 (N ≈ 70°)
- Neutral internal rotation stage 2 (hand behind the back-95°)
- Adduction (N ≈ 20-40°)-arm front of body
- Abduction (N ≈ 180°)-along coronal plane
- Horizontal flexion (N ≈ 130-160°)-from coronal plane
- Horizontal extension (N ≈ 40-50°)-from coronal plane
- Horizontal internal rotation (N ≈ 70°)-from coronal plane
- Horizontal external rotation (N ≈ 90°)-from coronal plane
Case #3 Continued

- Pain with **Hawkins** and **Neers** tests
- Pain with Flexion and Abduction $> 90^\circ$ of motion
Dx

• Sub-acromial Bursitis/Tendonitis
• leading to Adhesive capsulitis
CS injection (sub-acromial)
Spencer Technique
Case #4

- 21 yo softball pitcher with c/o right shoulder pain and a heaviness with right upper extremity tingling which occurs after throwing 40-50 pitches. Pain and numbness/tingling has been getting worse over the past 4 months. Pain and tingling resolve shortly after a pitching sensation has ended. She denies any specific injuries to the shoulder. No h/o prior shoulder trauma, including subluxation/dislocation. Meds don’t help with the pain.
- Examination (+) Roos, (+) Adsons, (+) Wrights tests
- Dx: ?
- Thoracic Outlet Syndrome (TOS)
- To confirm Dx of TOS; EMG/NCS is commonly performed to determine
Thoracic Outlet Syndrome (TOS) Tests

- **Roos Test** – Shoulder Abduction/External Rotation; Elbows flexed to 90 degrees, hands perform repetitive opening/closing of hands x 3 mins
  
  (Paresthesias) Numbness/Tingling + test

- **Adsons Test** – Shoulder/Arm held in Slight Extension and Abduction, slight extension of head turned toward affected side, physician palpates wrist for
  
  Weakened radial pulse or paresthesias + test

  (Scalene Triangle Impingement)

- **Wrights Test** – Hyperabduct arm above the head in the coronal plane, palpate radial pulse, notice change in pulse with patient turning head away
  
  Weakened radial pulse or Paresthesias + test

  (Pectoralis Minor Impingement)
Thoracic Outlet Syndrome (TOS) Etiology

- **Borders include:**
  - Middle & Anterior Scalenes, Anterior 1st Rib and Clavicle, *also cervical rib*

- Neurovascular Structures affected include:
  - Brachial Plexus
  - Subclavian Artery
  - Subclavian Vein
Physician pulls traction on the anterior axillary fold towards patient’s head while the patient inhales and resists the axillary fold retracting during exhalation. The thumb applies a counter-force on the supero-lateral aspect of the pectoralis minor muscle.
Facilitated Positional Release Inhalation
Rib/Elevated 1st Rib
Positions for performing FPR for an Elevated 1\textsuperscript{st} Rib
Still Technique (seated) Superior 1st Rib, Left

A

B

C

D
Case #5

• A 17 yo male swimmer presents for evaluation of left shoulder pain x 4 weeks. Pain is worse with overhead activity such as when he is doing the breaststroke. He is now starting to have pain when he is lying on his left shoulder in bed. He denies weakness, but has continued pain with overhead activities. He has a h/o left shoulder subluxation previously while water skiing over the summertime. Pain with activities is 8/10 on pain scale. Ibuprofen helps minimally with pain.

• (+) O’Briens and Biceps load tests, (-) Drop arm test and JOBE tests, (+)mild tenderness to palpation of the AC joint, (+) Apprehension/Relocation test
Drop Arm Test

- To screen for possible rotator cuff tear
- Have the patient fully ABduct the arm (160-180°)
- Instruct the patient to slowly lower the arm to the side.
- Tears in the rotator cuff muscles (specifically the supraspinatus) cause the arm to drop to the side once the arm has been lowered to about 90° of abduction.

Deltoid controls ABduction > 90°

- The patient will not be able to lower the arm slowly and smoothly no matter how many times he tries.

*differentiate from an Axillary Nerve Palsy due to weak, atrophied Deltoid

Watch for shoulder shrugging (cheating) by the patient
Special Tests

Empty Can/JOBE Test

To perform the Empty Can Test aka JOBE Test, have the patient assume a shoulder abduction angle as shown below (90° Abduction with 30° horizontal flexion anterior of coronal plane) and internal rotation (Thumbs DOWN), “like to empty a can.”

Doctor applies slight pressure downward on the distal forearm bilaterally to test for Supraspinatus weakness/pain.
Apprehension/Relocation Tests

- Patient should be placed in the Supine Position w/ arm off table as shown in pictures

- **Apprehension Test** is used to Evaluate an Unstable Shoulder — one that demonstrates ligamentous laxity/injury and has dislocated/subluxed
  - **Dislocated** – Remains Dislocated and Needs to be Reduced Back into the Glenoid Fossa
  - **Subluxed** – Relocates Spontaneously After Coming Out of the Glenoid Fossa

- **Shoulder is Vulnerable in ABduction and/or External Rotation** (Position of Apprehension/Relocation Test)

- **Relocation Test** – Posterior pressure is placed on the GH joint being tested, which gives relief of pain and sense of possible dislocation
Apprehension/Relocation Tests

Apprehension Test

Relocation Test
SLAP Lesion

- **Superior Labrum Anterior to Posterior** tear
  - Pain with lying on affected arm
  - Feeling of Instability, Grinding with GH Joint
  - O’Brien Test – forward flex shoulder w/ elbow extended, bring arm to midline 15 degrees, internally rotate (THUMB DOWN), resist force downward, then test with THUMB UP

*(+) Test if pain is present/worse with THUMB DOWN*

- Bicipital Load Test – Arm is Abducted 100° and Forearm Supinated, Flexed 90° and Patient attempts to Flex (fist towards head) against resistance
  - Pain on top of shoulder - think AC joint injury
  - Pain in shoulder joint - think injury to labrum
  - Pain @ Deltoid Insertion - think Rotator Cuff

- If this is being suspected and an MRI is being ordered, get it with an Arthrogram to better visualize a possible labral tear!
SLAP Lesion

- Superior Labral Anterior-Posterior Tear
- O’Brien’s Test Shoulder: Horizontal Flexion (90°) Adduction (15°) Internal rotation

Patient resists further motion in these directions

Thumb down (+) pain, possible tear
Thumb up (-) pain, alleviates
Glenohumeral Joint

- Labrum
  - fibro-cartilagenous structure
  - deepens the glenoid fossa
  - provides increased stability
Anatomy

• The Glenohumeral (GH) joint is loosely constrained within a thin capsule bounded by surrounding muscles and ligaments.
• The shoulder's great mobility is due to the shallow depth of the glenoid & the limited contact between the glenoid and the humeral head.
• Only 25% of the humeral head surface makes contact with the glenoid
Anatomy

• The Labrum, a fibrocartilaginous ring, attaches to the outer rim of the glenoid fossa, **provides some additional depth and stability.**

• HOWEVER: The shallowness and small surface area of the GH joint makes it **susceptible to instability and injury,** and require that stability be provided primarily by extrinsic supports.
Infraspinatus/Teres Minor

- Both tendons attach to the lateral humeral head (Greater Tubercle)
- Primarily involved w/ External Rotation of Shoulder
- Typically torn together, seen w/ massive rotator cuff tears

**Watch for Shoulder Shrug while attempting to lift arm**

- Tested with Patient Attempting to Externally Rotate Against the examiners counterforce
- DROPPING test – aka External Rotation Lag Test, flex elbow to 90, arm tight at side, ROTATE Externally to max point, then release, (+) if arm involuntarily drifts back to Neutral position
Subscapularis

- **Subscapularis** arises from the anterior scapula and attaches to the anterior humeral head *(lesser tuberosity)*

- Mainly involved with **Internal Rotation**

- Tested with **Subscapularis Liftoff Test** – internally rotate arm with dorsum of hand on lumbar spine, push away with resistance from examiner

- Tested with **Resisted Internal Rotation** vs. (opposite of External Rotation) {Infraspinatus/Teres Minor}
Case #6

- A 27 yo male presents with h/o recurrent right shoulder pain. He initially injured the shoulder playing football in high school. He states that the pain is on the top of his shoulder and also in the upper back radiating up his neck. He states getting a steroid injection in his shoulder about 2 years ago which helped with the shoulder pain. He is now getting the pain whenever he is lifting weights such as with bench press, doing dips and also push ups. He takes Tylenol occasionally for pain, which doesn’t really work. Pain is rated at 8/10 on pain scale with exacerbating activities and 2/10 with rest following a work out.
Case #6 continued

- Examination reveals pain to palpation at the right AC joint with pain exacerbated with cross arm Adduction test
- He also has pain on the right upper back at the superior-medial scapular border radiating up to his ipsilateral cervical spine
AC Joint Injuries

• The AC joint has a cartilaginous disk and synovial membrane

• Injuries to the AC joint are classified according to the position of the clavicle with respect to the acromion and coracoid

• Injuries usually due to direct trauma superior or laterally, or forced adduction of the arm

• the distal clavicle is held in alignment with the acromion by the strong coracoclavicular (CC) ligament comprised of 1) conoid, and 2) trapezoid ligaments
Acromioclavicular (AC) Joint

- Acromioclavicular (AC) joint and ligament
- Trapezoid ligament
- Conoid ligament
- Coracoclavicular (CC) ligament
- Acromion
- Clavicle
- Coracoacromial (CA) ligament
- Coracoid process
- Scapula
AC Joint Sprains/Injuries

- Seen w/ pain to direct palpation of the AC joint
- Crossed Arm Adduction Test also indicative
- 6 Types of AC joint injuries
  1) Partial tear of the AC ligaments, and manifest as a tender AC joint that often has **mild swelling but no deformity**
  2) Represent a **complete tear of the AC ligaments and partial tear of the CC ligaments**
  3) Involves a **complete disruption of both the AC and CC ligaments**
  4) Occurs with forceful shoulder trauma that causes disruption of the AC and CC ligaments, and **displaces the distal clavicle into or through the trapezius**
  5) Represents significant disruption of the AC and CC ligaments, along with disruption of the muscular and fascial attachments of the distal clavicle
  6) rare and involve severe dislocations of the AC joint in which the distal clavicle is forced into the subacromial or subcoracoid position
Ligament Sprain/Tear

Treatment Options:
- OMT
- +/- Short Period of Immobilization for Pain Relief
- Physical Therapy/Daily Stretching
- NSAIDs
- Corticosteroid Injection or Prolotherapy
- Surgery if unstable/continued pain/failed conservative management

- Corticosteroid injection: 0.5 mL/0.5mL/0.5 mL {lidocaine/marcaine/betamethasone or triamcinolone}

- Prolotherapy: Dextrose 50% MIXED with Lidocaine to promote inflammation and healing (no NSAIDs or CS 1 week prior or for 4 weeks after injections)
Imaging

- AP view – If looking for a separation of the AC joint:
- Normal spacing intervals are:

  1) separation from acromion and clavicle should be < 8 mm
  2) separation of coracoid and clavicle should be < 13 mm

**x-ray should be taken as the patient holds a weight in his or her affected shoulder**
Radiographs of AC Joint Injuries

Type 1 AC Joint Injury: tearing of the AC ligament

Type 3 AC Joint Injury: tearing of the AC and CC ligaments
OA of Shoulder Joint

1. Osteoarthritis of the GH joint represents wear-and-tear of the articular cartilage of the glenoid, labrum, and humeral head (more of chronic problem, however RARE)
2. Seen with prior h/o fractures, dislocations, major rotator cuff tears
3. Also consider Metabolic Disease (DM, Hypothyroidism, RA) as a presdisposing/contributing factors
Anatomy

**Levator Scapulæ**

- originates on TP of C1-4,
- inserts on superior-medial angle of scapula

* innervated by C2-4

**Commonly seen is muscle spasm especially @ supero-medial scapular border**

- Tx: Trigger Point injection with Lidocaine/Marcaine {50/50 ratio} +/- Homeopathic agent
Levator Scapulae

- Place the arm behind the back to rotate the scapula medially.
- Push the scapula superiorly and medially from the inferior angle to shorten the muscle.
- Patient’s head placed on a pillow to achieve side bending of the neck toward the dysfunctional side.
- Follow the other steps for performing Counterstrain treatment
Anterior Acromioclavicular Joint (AAC)

- At the anterior joint of the acromion and clavicle
- Ligamentous
- Similar treatment can be used in cases of anterior deltoid tenderpoint
Flexion, slight internal rotation, adduction with traction across the body
Posterior Acromioclavicular Joint (PAC)

- At the posterior joint of the acromion and clavicle
- Ligamentous
- Posterior deltoid dysfunction can be treated approximately the same way, with fine tuning
PAC

- Patient prone
- Pull arm back into extension and slight horizontal adduction
- Hand held at about midline near/behind waist
Shoulder Pain
Viscero-somatic vs. Somatic

- Where is the pain coming from?
- **NOT ALL SHOULDER PAIN IS ACTUALLY SHOULDER PAIN**
- Check elbow/cervical/thoracic spines

- Visceral dysfunction needs to also be considered in the diagnosis.
**Referred Shoulder Pain**

**Boa’s Sign**
- Pain in right shoulder/upper back
- Referred pain from abdominal organs on the right
- Indicates possible cholecystitis, pyloric stenosis or duodenal ulcer

**Kehr’s Sign**
- Pain in left shoulder/upper back
- Referred pain from abdominal organs on the left
- Indicates possible splenic injury (splenic rupture in supine patient), gastritis, gastric ulcer or even renal stone
- Also possible Cardiac etiology
Post-Test Question #1

1) Which nerve is most commonly injured with a gleno-humeral shoulder dislocation?

   a) Axillary Nerve
   b) Suprascapular Nerve
   c) Musculo-cutaneous Nerve
   d) Radial Nerve
   c) Ulnar Nerve

Answer: A) Axillary Nerve
Post-Test Question #2

2) How many ligaments make up the Coraco-clavicular Ligament?

a) One  
b) Two  
c) Three  
d) Four  
c) Five

Answer: B) Two

The Conoid and Trapezoid Ligaments
Post-Test Question #3

3) Which of the following tests is used to evaluate for Bicipital Tendonitis?

a) Jobe
b) Apprehension
c) Hawkins’
d) Apleys
e) Speeds

Answer: E) Speeds
Post-Test Question #4

4) How many muscles either attach or originate on the Scapula?

   a) 7
   b) 10
   c) 15
   d) 17
   e) 21

Answer: D) 17
Post-Test Question #5

5) What is the name of the (true AP) radiographic view that is taken in the plane of the scapula (30-45° medial to lateral)

a) Scapular Y
b) Swimmers
c) Zanca
d) Serendipity
e) Grashey

Answer: E) Grashey
6) Which of the following Osteopathic Manipulative Medicine Techniques will work best at improving ROM of the Glenohumeral Joint?

a) Miller Pump  
b) Dalrymple Pump  
c) Spencers Technique  
d) AC Joint Counterstrain  
e) Myofascial Release of the Scapulothoracic Joint

Answer: C) Spencers Technique