

Anatomical tips relevant to shoulder pathology



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possible movements are:

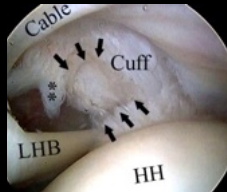


- Flexion
- Extension
- Abduction
- Adduction
- Inter. Rotation
- Exter. Rotation
- Circumflexion

- GHJ has a really huge ROM
- it can become even bigger with special exercises for laxity

INCREASING incidence of Trauma & Pathology

- Rotator cuff pathology **very common** after 50 y.o.
- Shoulder is **3rd most common area** for musculoskeletal pain
- commonest pathology: **subacromial impingement** with 5 new diagnosed/103 patients/year



Van der Windt, Ann Rheum Dis 1995
Engelbrechtsen, Shoulder elbow 2015

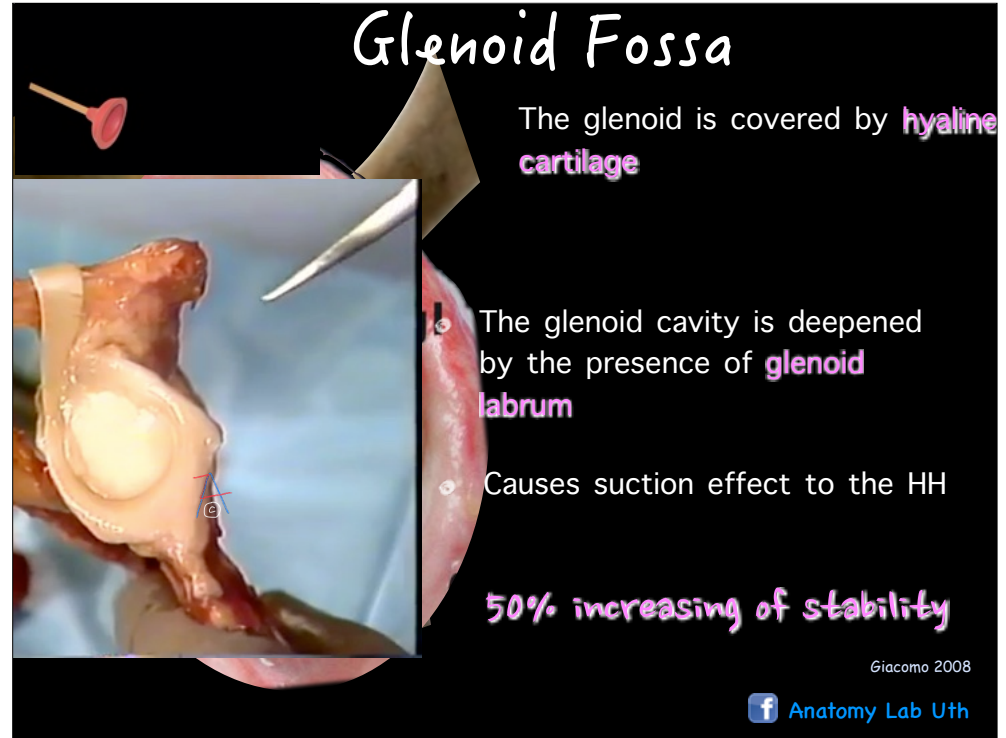
Glenoid Fossa

The glenoid is covered by **hyaline cartilage**

• The glenoid cavity is deepened by the presence of **glenoid labrum**

• Causes suction effect to the HH

50% increasing of stability



Giacomo 2008

FIBROUS CAPSULE

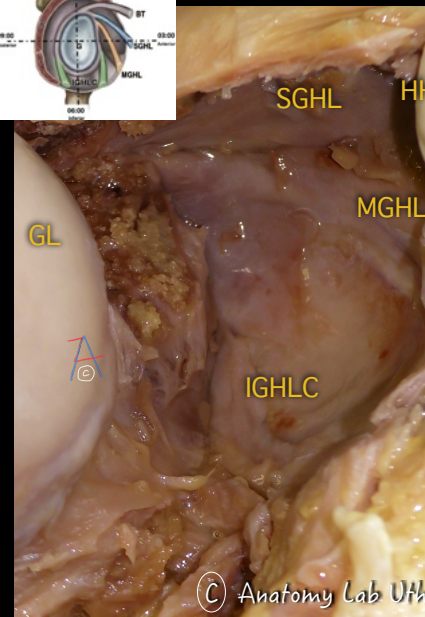
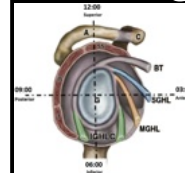
The capsule is thin and lax, allowing a wide range of movements



...But... not for joint stability



LIGAMENTS: anterior complex middle glenohumeral

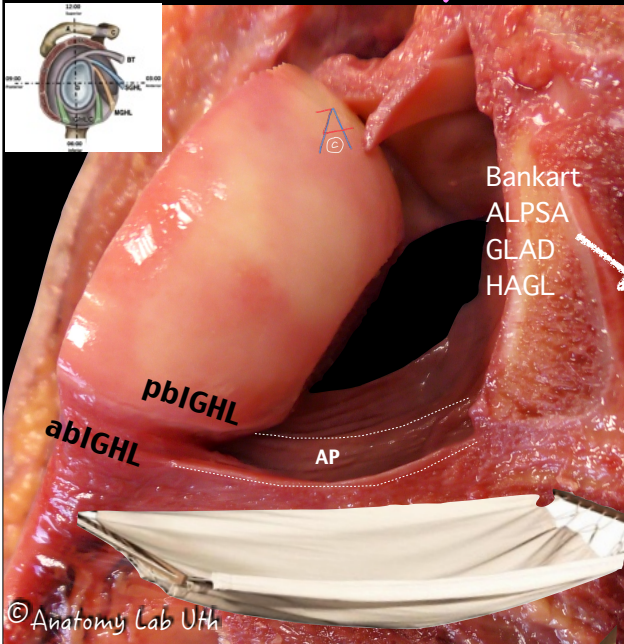
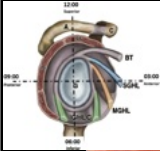


arising just inferior to the SGHL

inserts to the anterior aspect of the anatomic neck of the humerus

Resists anterior and posterior translation at 45° abduction and external rotation

LIGAMENTS: inferior glenohumeral complex



complex

2 bands: anterior posterior
axillary pouch

Bankart
ALPSA
GLAD
HAGL

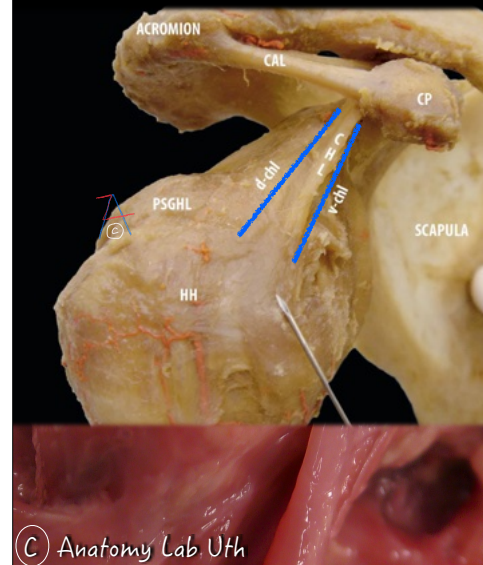
they work as a hammock

Resists anterior-inferior
translation of the arm in
90° of abduction and
external rotation

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LIGAMENTS: superior complex coracohumeral ligament



Arises from the root of the
coracoid process

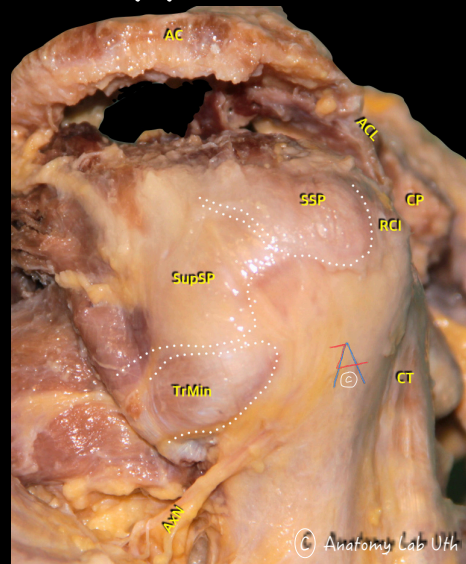
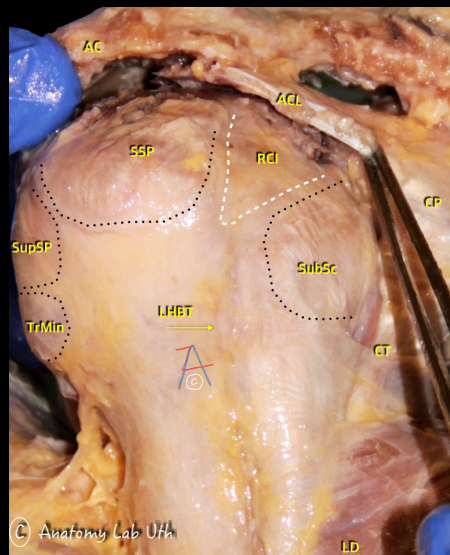
Inserts to the
greater tuberosity of the humerus

- strengthens the capsule from above (glenohumeral instability)
- Important role
 - proprioceptive innervation
 - adhesive capsulitis

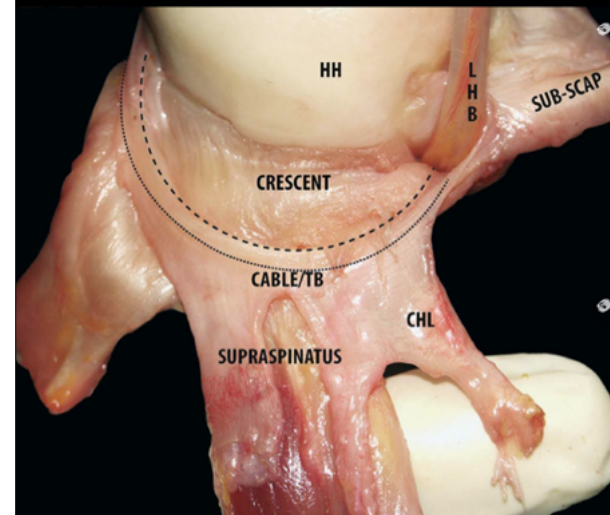
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MUSCLES: Rotator Cuff



LIGAMENTS: Rotator Crescent



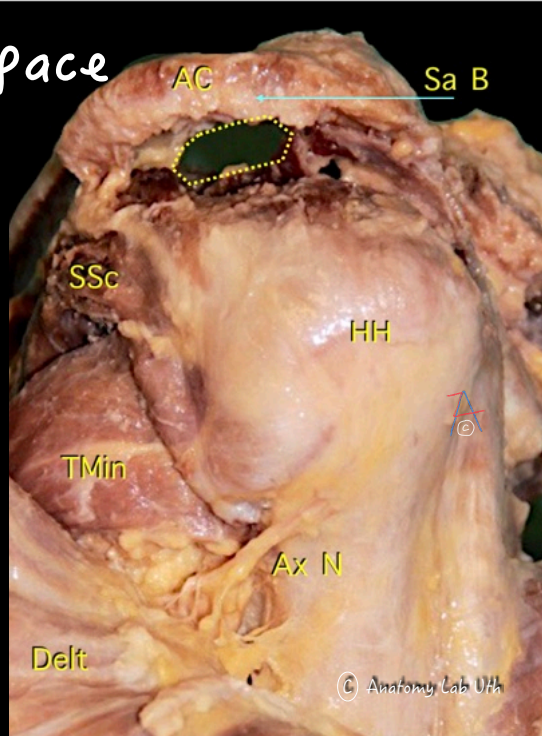
- was found to measure an average of
- 41.35 mm in the AP direction
- 14.08 mm in the ML direction
- average thickness of 1.82 mm
- rotator cable has an average thickness of 4.72 mm

Laitman 2013

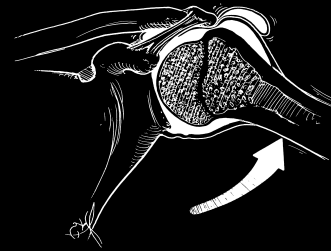
Subacromial space

- Standard AP radiographs: 9-10mm in normal young adults
- MRI: 7.7mm in elder adults without complete rotator cuff tears

de Oliveira França
Rev Bras Ortop. 2016



SUPRASPINATUS ROLE IN ABDUCTION



the greater tuberosity of the humerus comes into contact with the acromion

Laitman 2013



100-120° abduction



Differential Diagnosis

Diagnosis	Primary Care %	Age
Subacromial Impingement Syndrome	48-72	23-62
Adhesive Capsulitis	16-22	53
Acute Bursitis	17	-
Calcific Tendonitis	6	-
Myofascial Pain Syndrome	5	-
Glenohumeral Joint Arthrosis	2.5	64
Thoracic Outlet Syndrome	2	-
Biceps Tendonitis	0.8	-

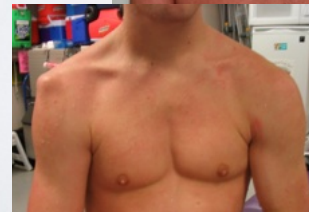
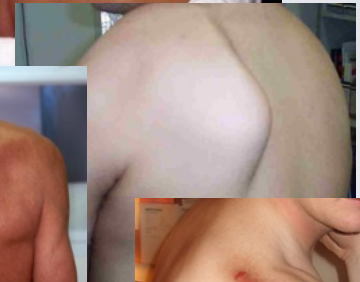
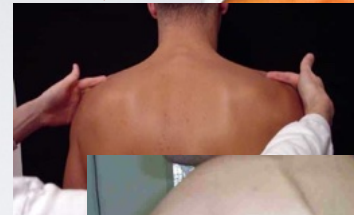
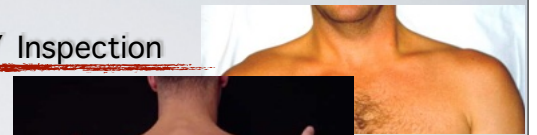
Clinical History

- Characterize pain
- Location of pain
- Night pain
- Weakness
- Deformity
- Instability
- Locking / Clicking / Clunking
- Sport / Occupation
- Previous treatments
- Alleviating / Exacerbating
- Acute vs. Chronic
- Traumatic vs. Overuse
- History of prior injury



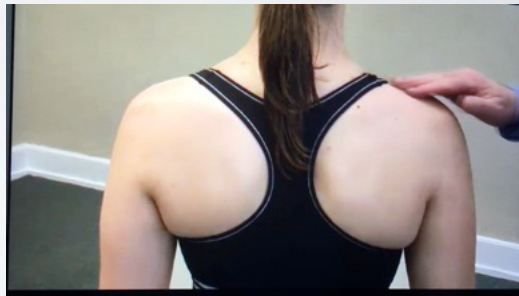
Physical Exam – Observation / Inspection

- Front & Back
- Height of shoulder & scapulae
- Asymmetry
- Obvious deformity
- Ecchymosis
- Muscle atrophy
 - Supraspinatus
 - Infraspinatus
 - Deltoid



Palpation

- At rest & with movement
- Bony structures
- Joints
- Soft tissues



Non-Arthritis Shoulder Pain

Non-Operative

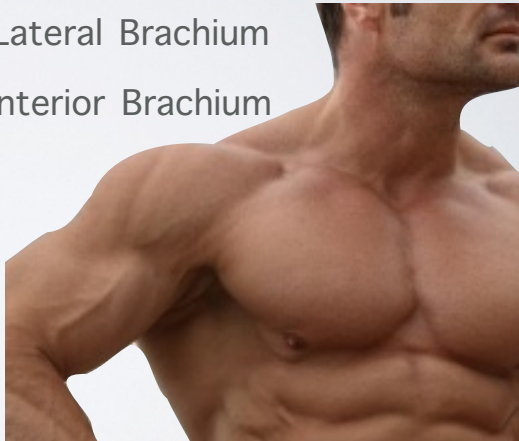
- Subacromial Impingement????
- Subacromial Bursitis ?
- Adhesive Capsulitis – “Frozen Shoulder”
- Biceps Tendonitis

Operative &/or Non-Op

- Rotator Cuff Tear
 - Acute, Known Injury
 - Chronic, Unknown Injury
- Proximal Biceps Tendon Tear
- Labral Tear
- Glenohumeral or AC Joint Arthritis
- AC Joint Sprain
 - “Separated Shoulder”
- Shoulder Instability

Shoulder Pain Radiating Patterns

- Sternoclavicular Joint → Up SCM/Front of Neck
- Acromioclavicular Joint → Upper Trap/Lat. Neck
- Subacromial Space → Lateral Brachium
- Biceps Tendons → Anterior Brachium



Subacromial Bursitis

Imaging

- 3-4 views of the Shoulder
- – AP Int. & Ext. Rotation &
- Axillary +/- Scapular-Y view
- – Usually normal
- • Obtain these in setting of injury and/or to screen for calcific rotator cuff tendonopathy or osteoarthritis
- U/S!!
- Neck XR only if reproducible radicular signs/symptoms

Treatment

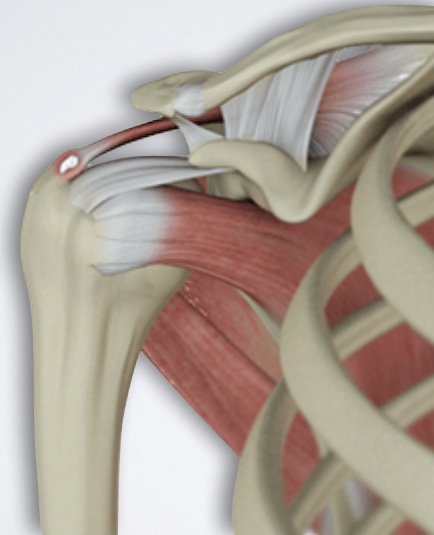
Subacromial CS Injection only U/S guided

- PO NSAIDs +/- Narcotics
- Rehab after pain improvement
- to address Impingement??
- • Subacromial Decompression +/- Bursectomy ??? only if conservative Tx fails

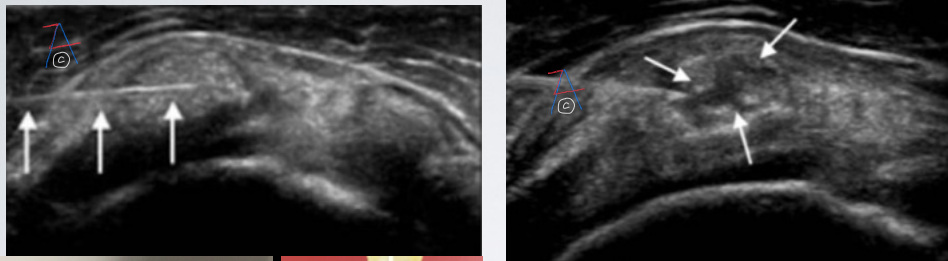
Injection only US guided video



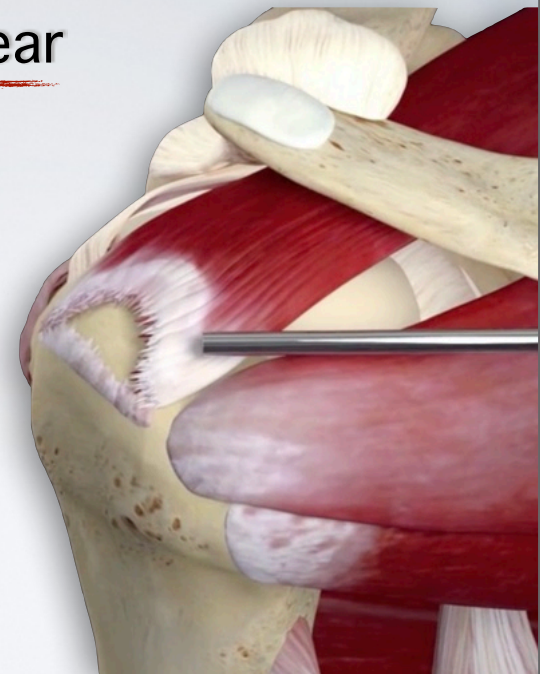
Calcific Rotator Cuff Tendonopathy



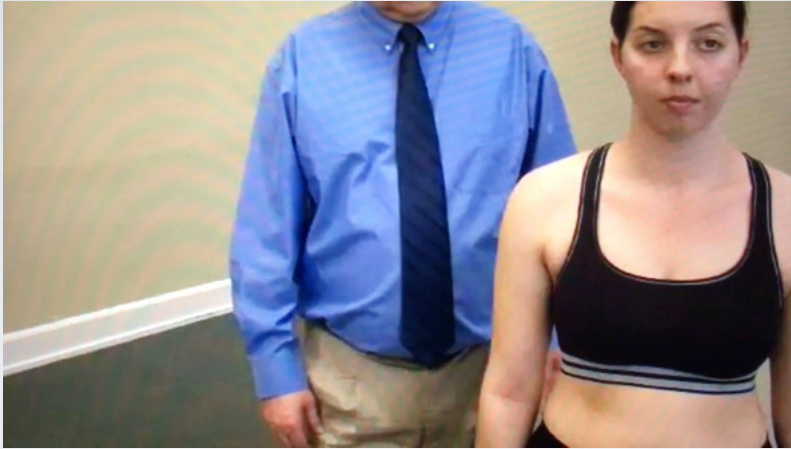
Calcific Rotator Cuff Tendonopathy Treatment



Rotator Cuff Tear



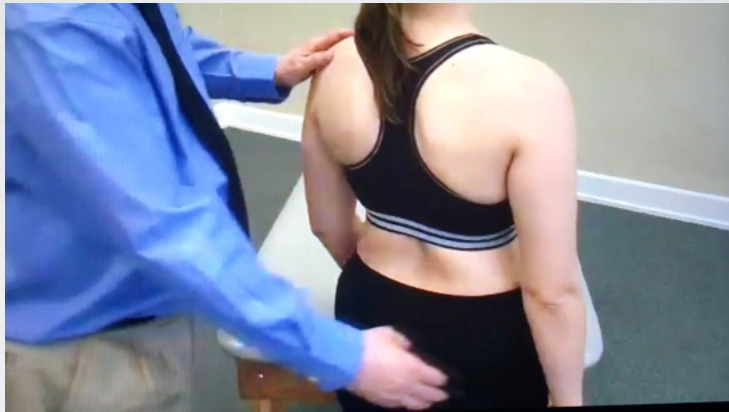
SUPRASPINATUS TEST



INFRASPINATUS TEST



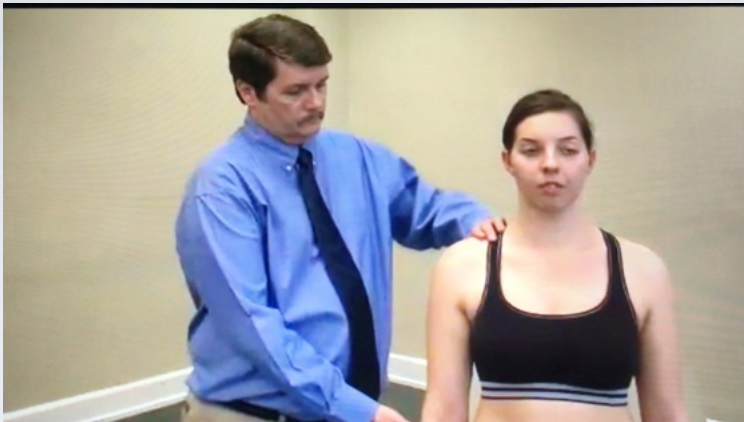
SUBSCAPULARIS TEST



Drop Arm Test



Cross-Arm Adduction Test



AC Joint DJD

Imaging



X-ray

– Joint **space narrowing** and **osteophytes**

Neck XR only if reproducible radicular signs/symptoms

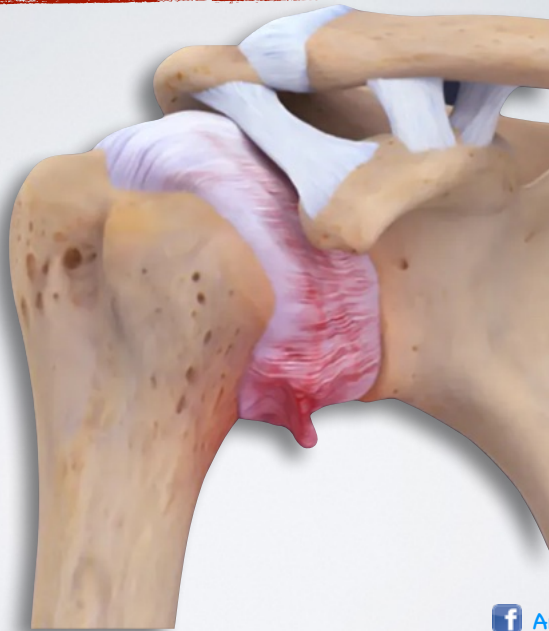


treatment

AC joint CS Injection (US)

- Topical or PO NSAIDs and Ice
- Rehab
 - Addressing **Impingement mechanics** off loads the AC joint
- **Strengthen Scapular Stabilizers**
- **Stretch** Tight Posterior **Capsule** and **Pectoralis Minor**
- **Distal Clavicle Excision** if conservative Tx fails

Adhesive Capsulitis



Adhesive Capsulitis

History

- (+) Rest Pain
- Pain worse with reaching
- Progressive Loss of Motion
- Most common in Females, 40-60 y/o
- May have autoimmune or chronic inflammatory etiology

Diabetes (25%)

Hypothyroidism

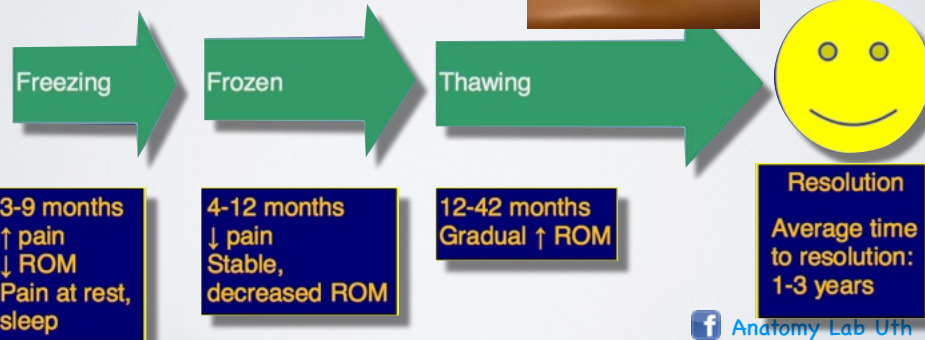
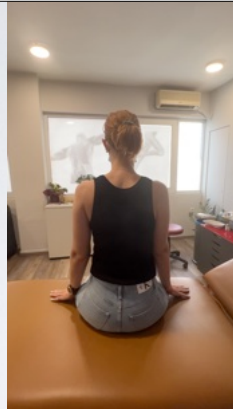
- Usually insidious onset
- May be capped by event or the start some time after an event/trauma
- No change in pain w/ Neck ROM

Exam

- Limited passive motion
- Movements with scapula
- Diffusely Tender To Palpation
- Pain in all planes of motion may limit strength
- Limited motion can prohibit Neer's and Hawkins' tests

Adhesive Capsulitis

Education & Expectations



biceps palpation test



Biceps Tendonopathy

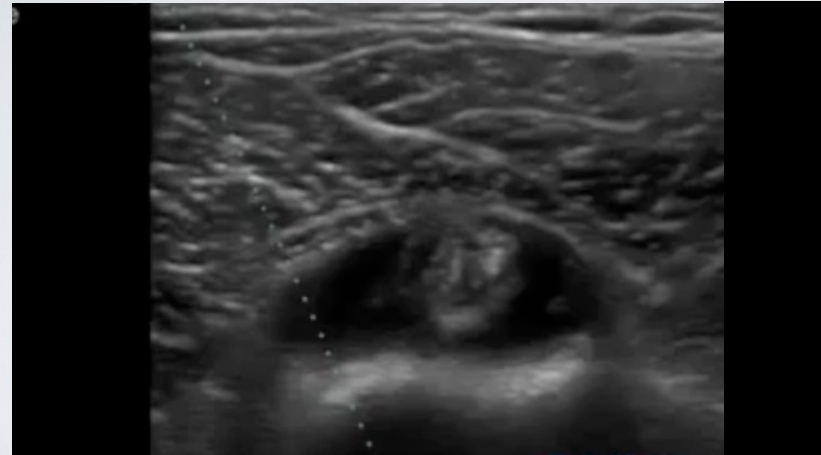
Imaging

- X-Ray Usually normal
- Consider **MSK U/S**
- – Usually used to confirm if Dx is unclear on exam or if using U/S for guided CS injection

Treatment

- **Rehab**
 - **Eccentric** Biceps exercises
 - **Stretch** Biceps in extension
- Tendon Sheath **CS Injection US guided**
- Topical or PO NSAIDs or APAP
- Ionto/Phonophoresis **????**
- **Biceps Tenodesis** if conservative Tx fails

Tendon Sheath **CS Injection US guided**



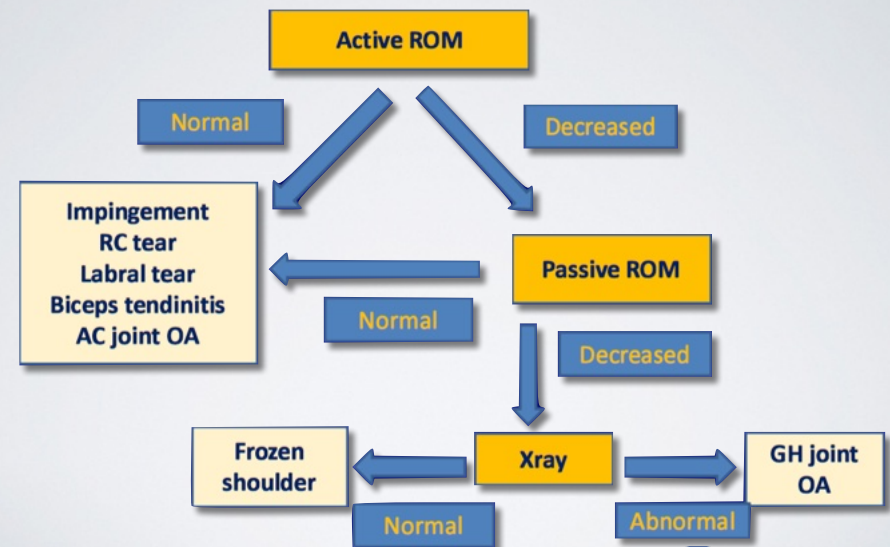
Glenohumeral DJD Imaging

•x-rays

- Joint space narrowing
- osteophytes
- humeral head and/or glenoid flattening



SHOULDER: DIAGNOSIS DRIVEN EXAM



Arthritis

- There are **many types of arthritis**
 - The most common type of arthritis in the shoulder is osteoarthritis
 - **avoidance of movements** in an attempt to lessen arthritis pain leads to a **tightening or stiffening of soft tissue of the joint**
 - resulting in a **painful restriction of motion**

final Summary

- **Was there an injury/event? Or was it a process?**

- **Injury/Event** – Rot. Cuff Tear; Subacromial Bursitis, AC or GH Dislocation

- **Process** – Impingement, Frozen Shoulder, Biceps Tendonitis, DJD

- **Do they have “Rest Pain”?**

- **No** – Impingement, Rotator Cuff Tear (after initiating pain), Prox. Biceps Tear

- **Yes** – Subacromial Bursitis (rapid), Frozen Shoulder (gradual), DJD (constant), AC or GH Dislocation (acute)

- **Where does it hurt? Where does the pain go? What causes it?**

- AC-Lateral Neck, Subacromial Space-Lateral Brachium, Biceps-Ant. Brachium – Tendonopathy hurts with palpation, stretch, and contraction

- **Appropriate X-Ray will adequately address most shoulder pain** – Always include an A/P Int./Ext. Rotation views with an Axillary view

- If Acute Rotator Cuff Tear suspected -> MRI

- If Glenohumeral Instability -> Scapular-Y

Imaging

When is it warranted?

- Trauma
- Very large loss in range of motion/severe shoulder pathology
- Red flags ie history of cancer, unexplained weight loss
- Failed conservative management
- Dislocation- can still be managed conservatively
- Unclear diagnosis


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When is Physio Indicated

- Rotator cuff pathology and impingement.
- Dysfunctional scapula position
 - Significant symptom relief and improvement of range of motion from scap repositioning

Stiff shoulder

- ???Frozen shoulder!!!!. Especially stages II and III when pain has decreased and shoulder is stiff
- Hypermobile/unstable shoulder
- post shoulder surgery

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IF RED FLAGS

If you suspect **infections** :

WBC


Blood culture

Chest x-ray

Aspiration of joint

EMG (electromyogram), which can indicate nerve damage

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