

# Shoulder Pain in the Athlete

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**SPORTS MEDICINE**  
OREGON

# Introduction

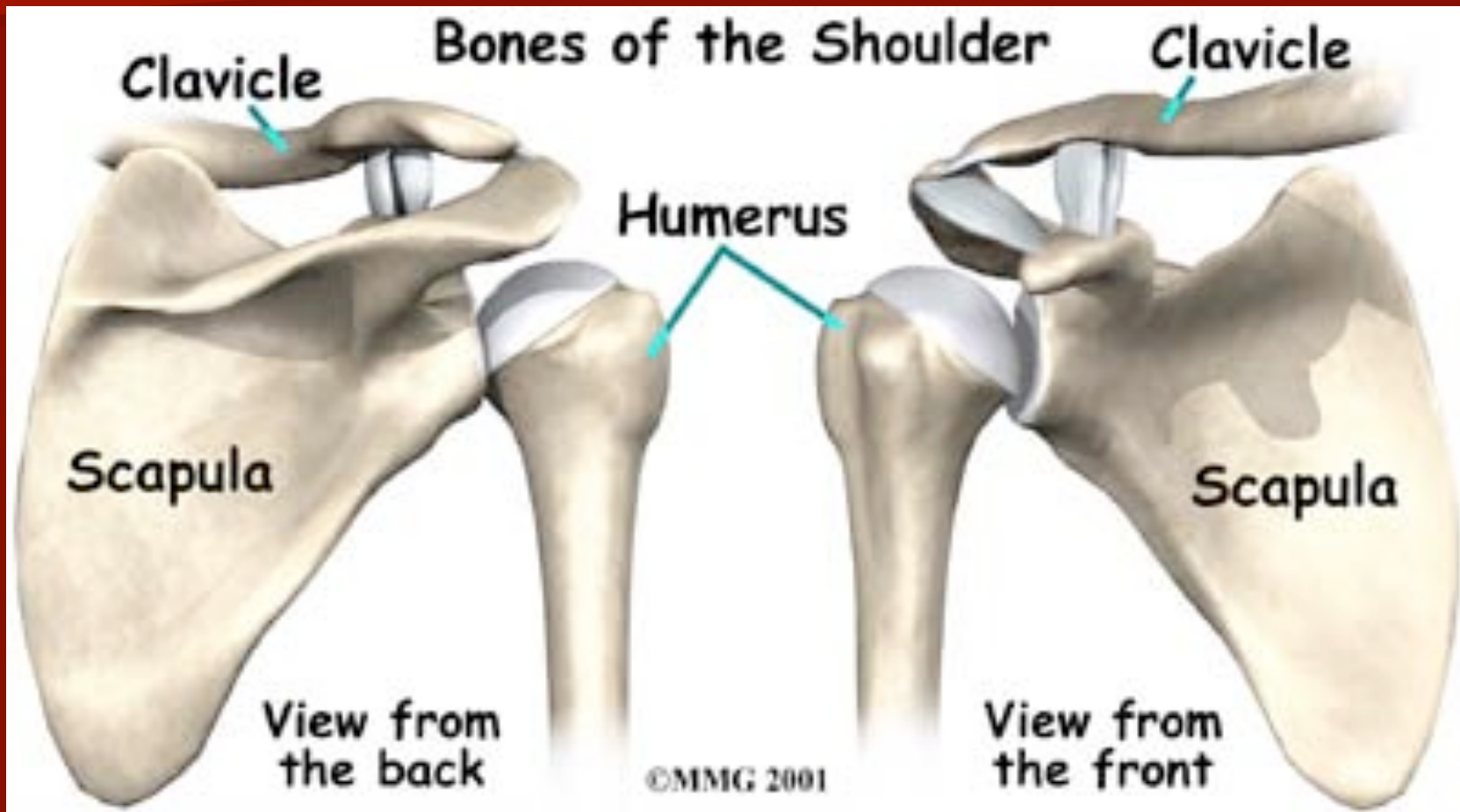


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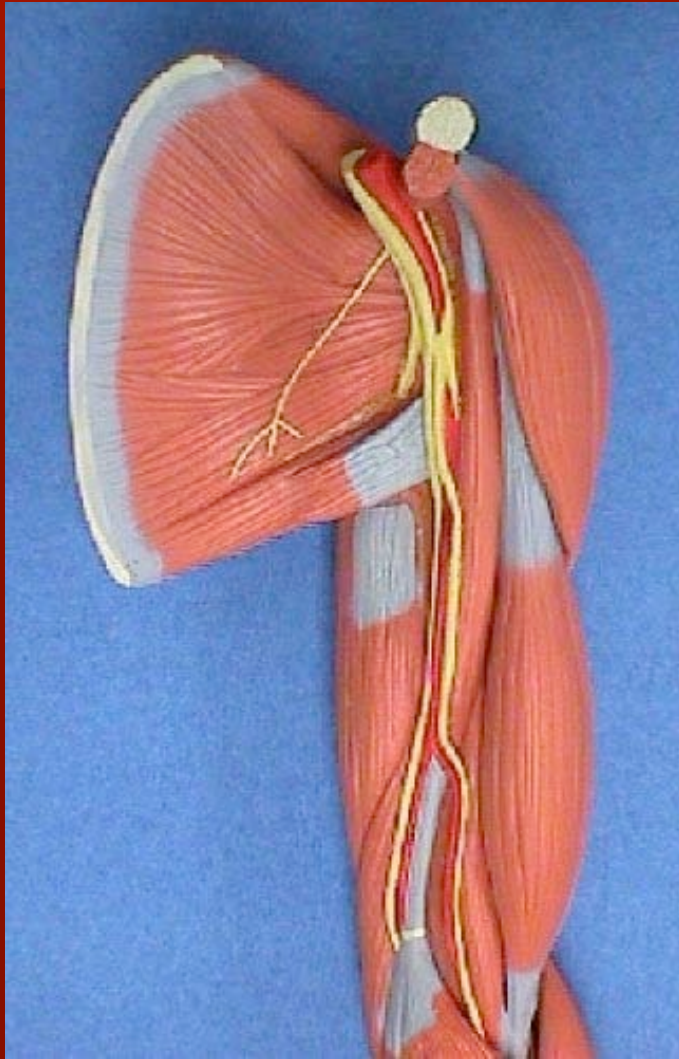
# Shoulder

- Complex of multiple joints
  - Glenohumeral Joint
  - Acromioclavicular Joint
  - Sternoclavicular joint
  - Scapulothoracic
- Numerous muscles
  - 18 involved in shoulder girdle motion
- Greatest range-of-motion
  - 2/3 Glenohumeral, 1/3 scapulothoracic
- Tenuous Stability – susceptible to injury

# Anatomy

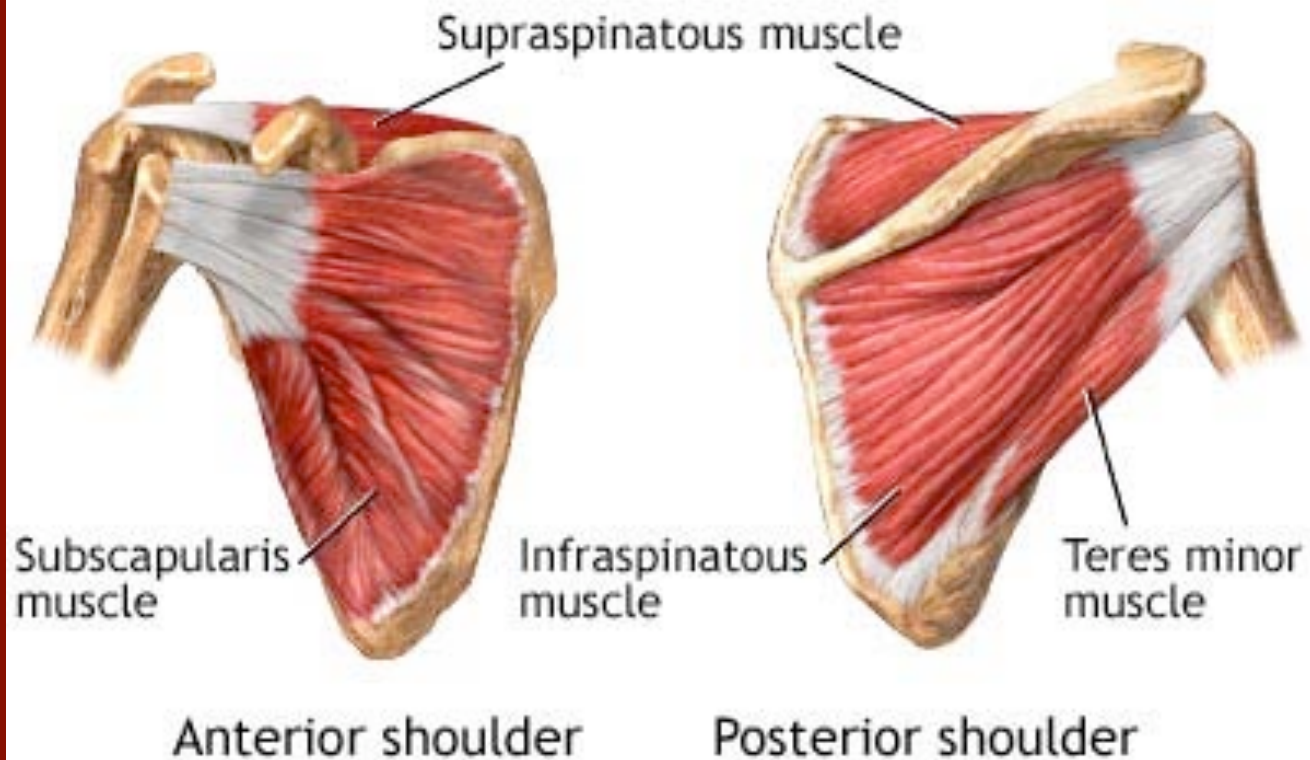


# Anatomy

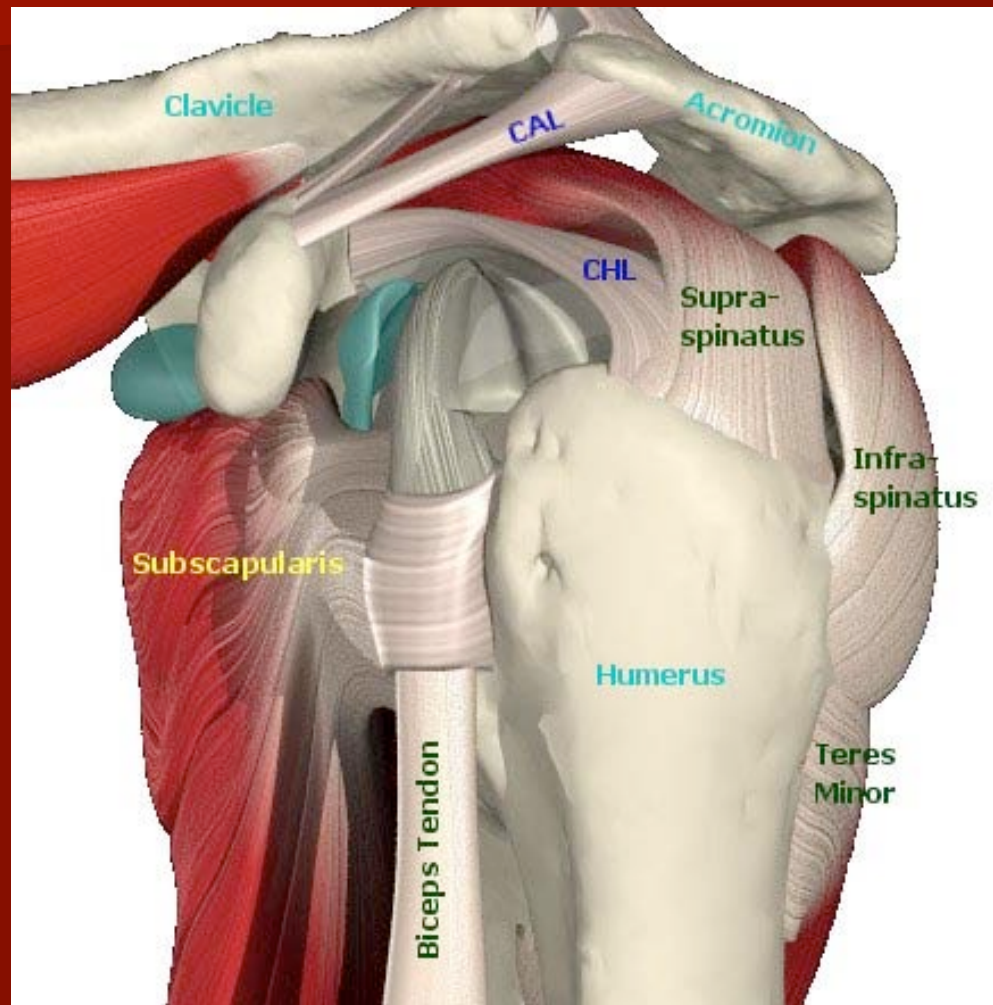


# Anatomy

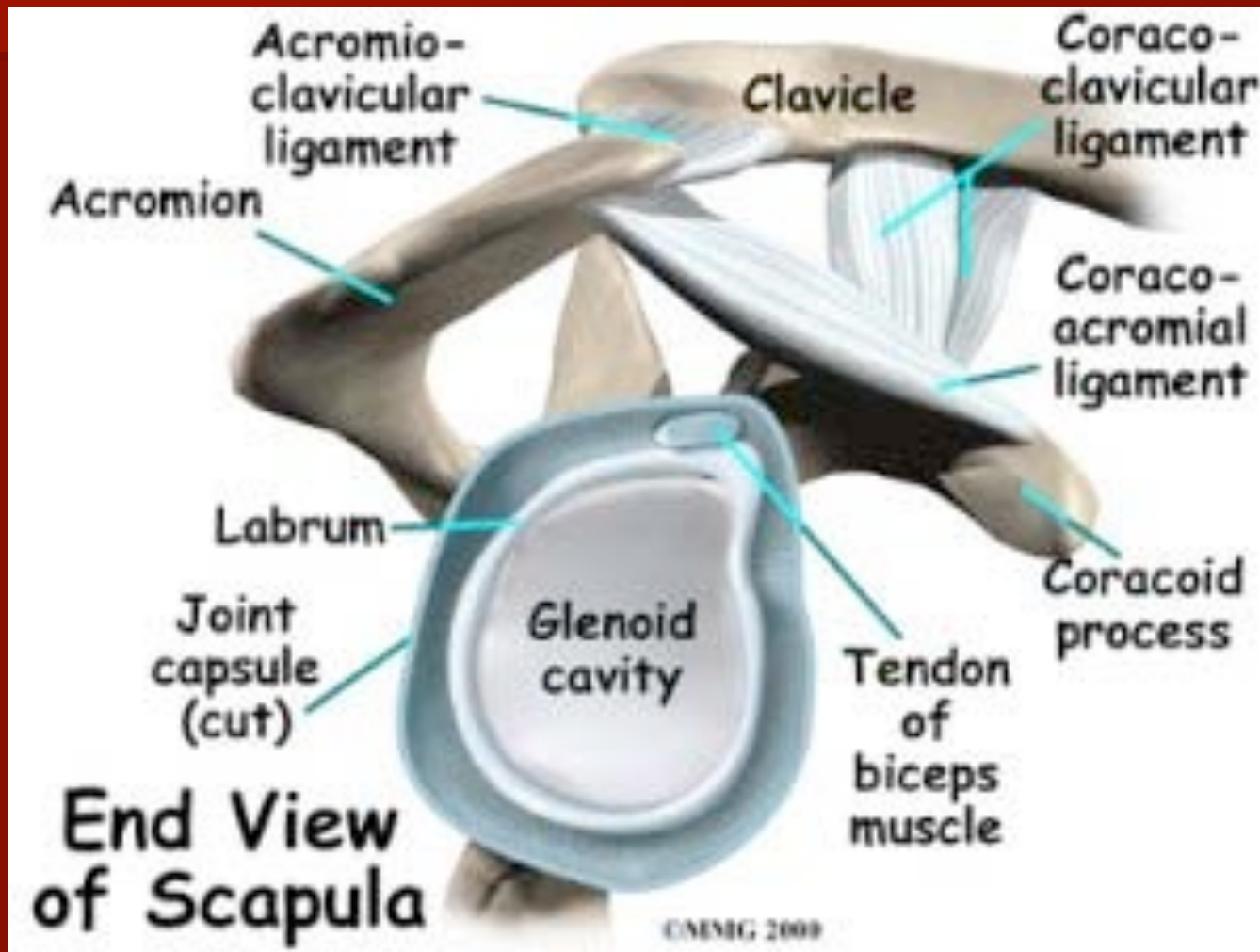
## Rotator cuff muscles



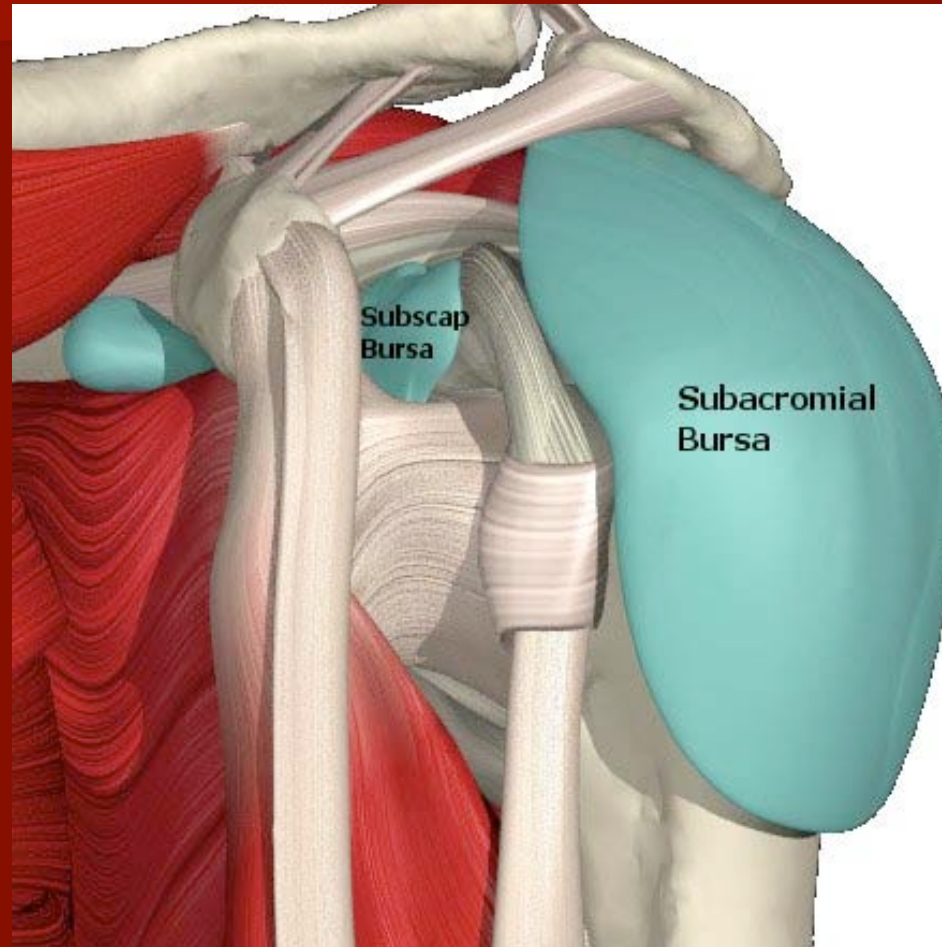
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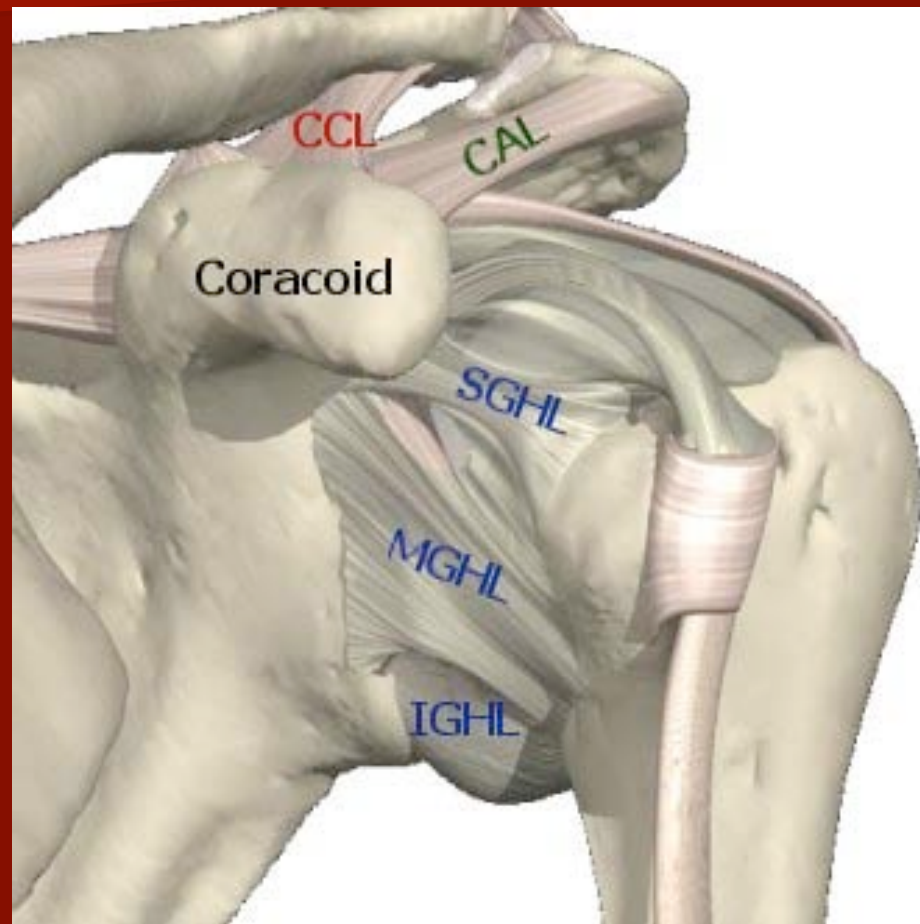
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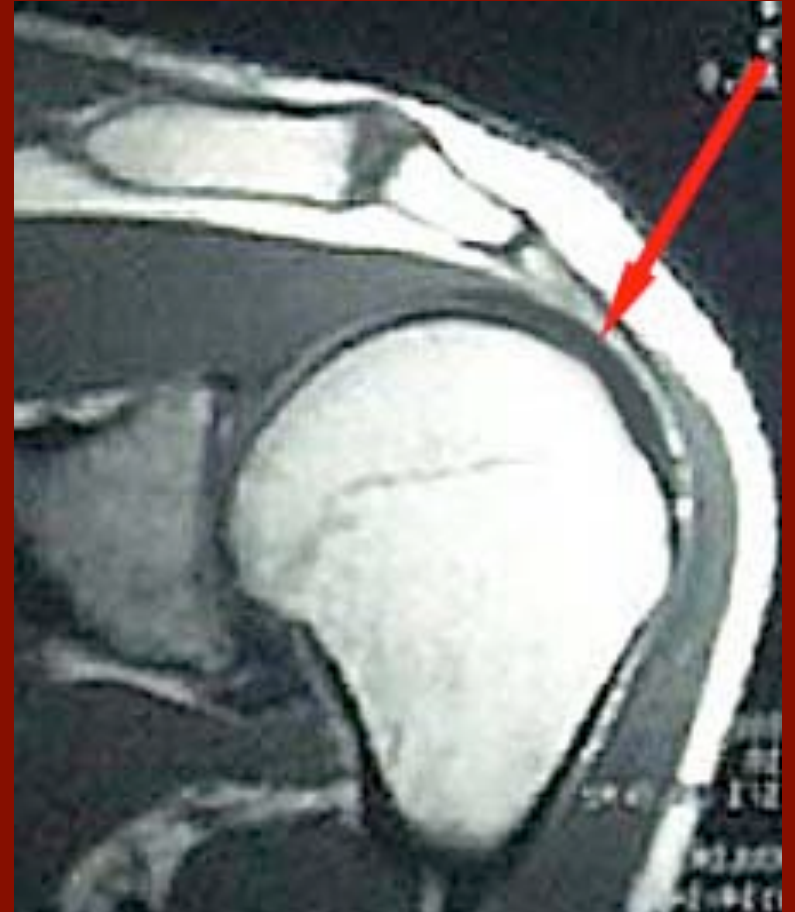
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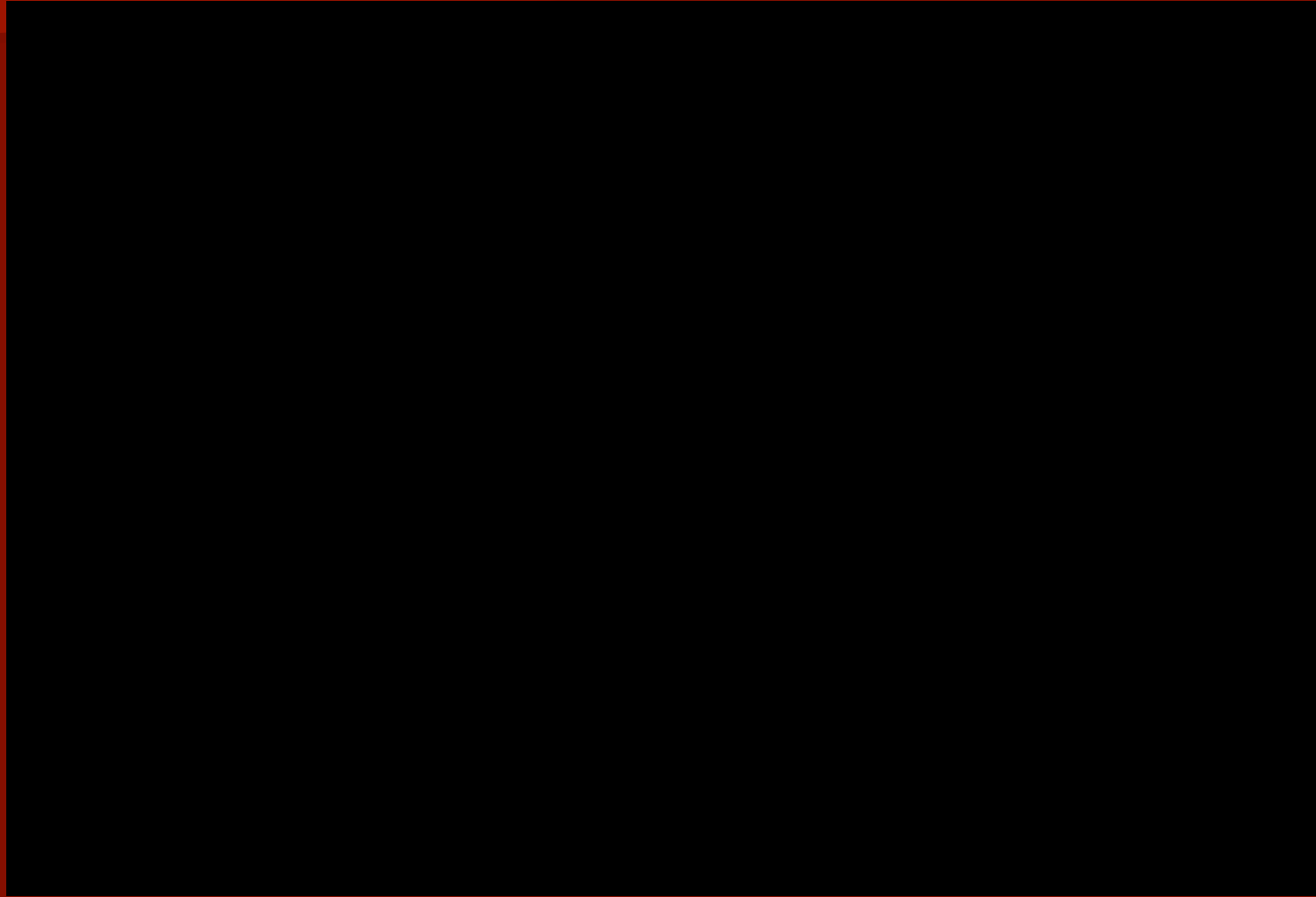
# Anatomy



# Anatomy



# Anatomy



# Shoulder Pain Causes

- Overuse injuries – tendinitis, bursitis
- Injuries – tendon, cartilage, ligament tears, fractures
- Instability – traumatic/congenital
- Arthritis

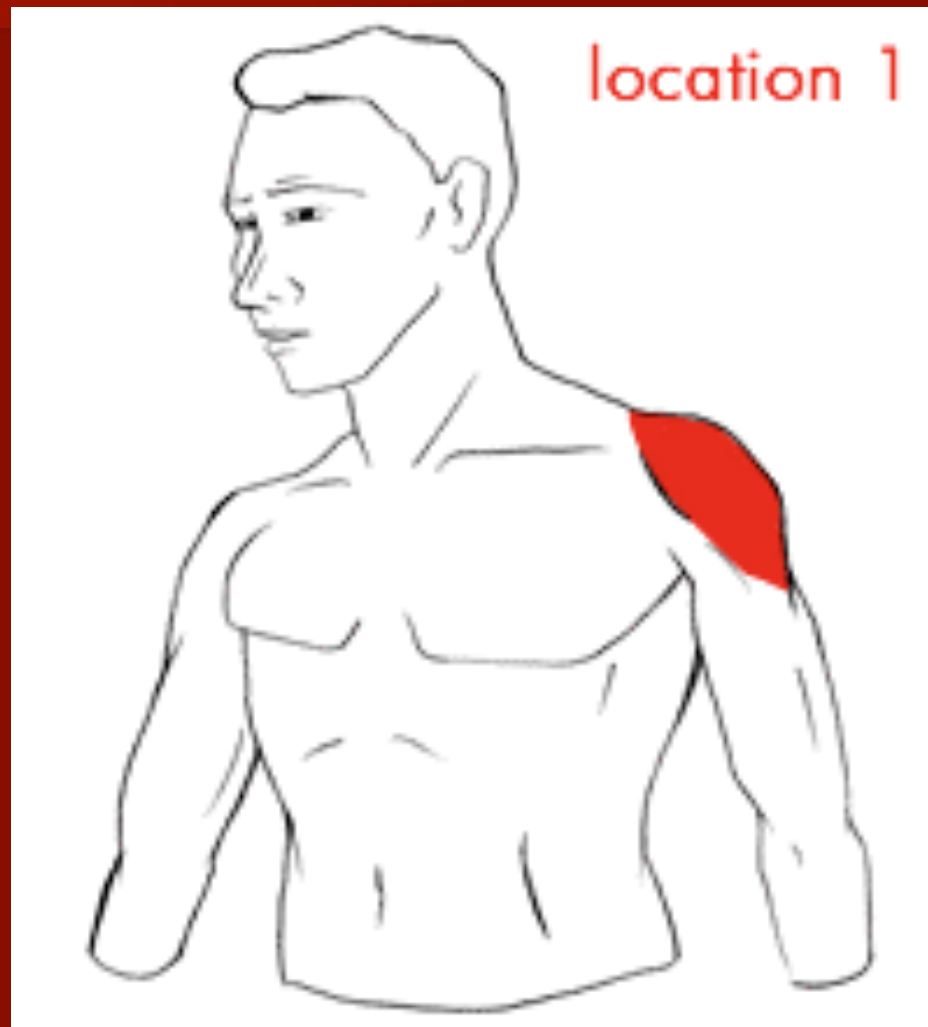
# Tendinitis

- Acute – overuse injury
- Chronic – tendon degeneration and wear
- Common locations
  - Rotator Cuff
  - Biceps Tendon

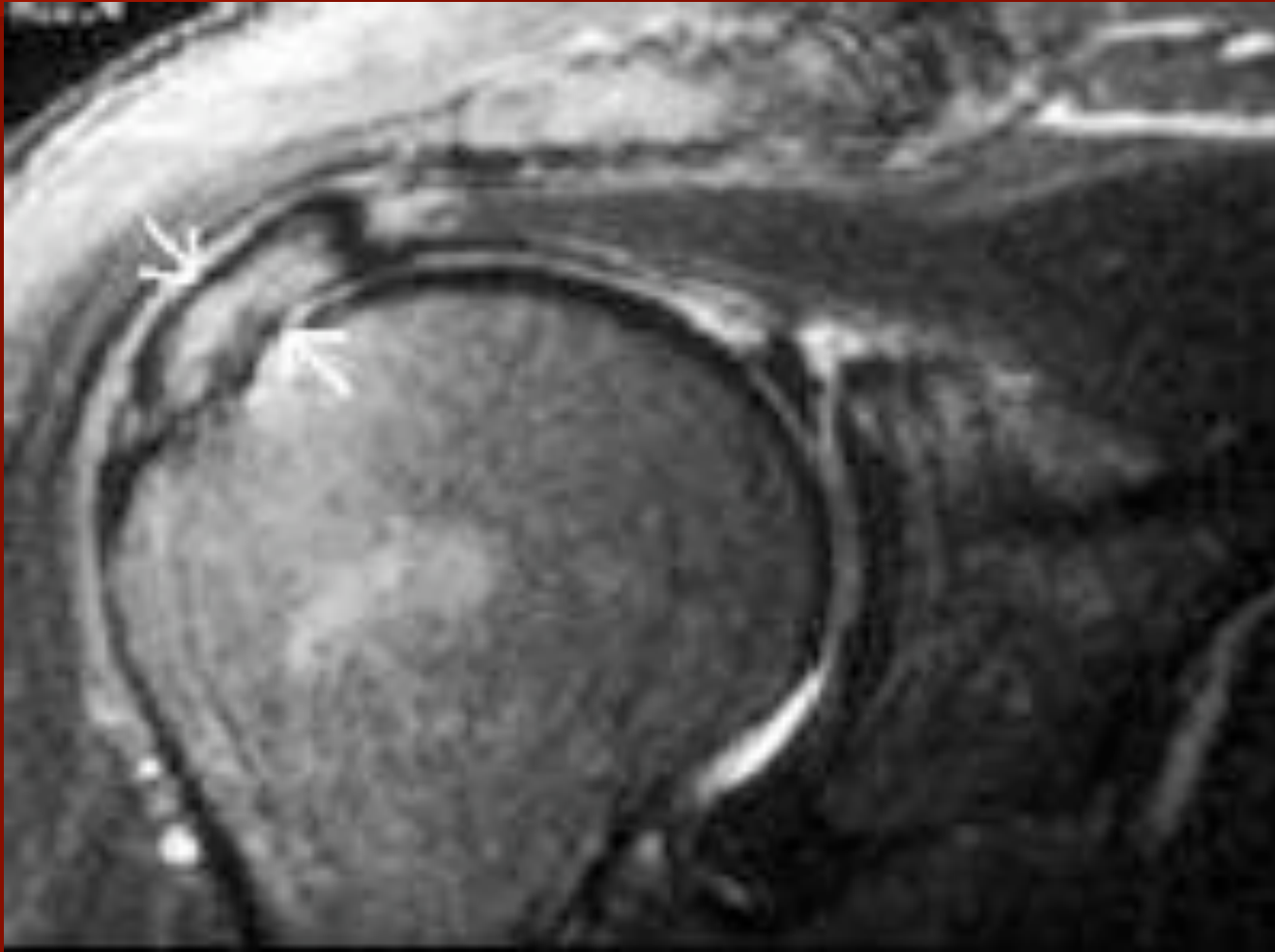
# Rotator Cuff Tendinitis

- Swelling, inflammation in rotator cuff muscles
- Pain upper, outer shoulder
- Overhead, rotatory motions
- Pain at night
- Weakness due to pain

# Rotator Cuff Tendinitis



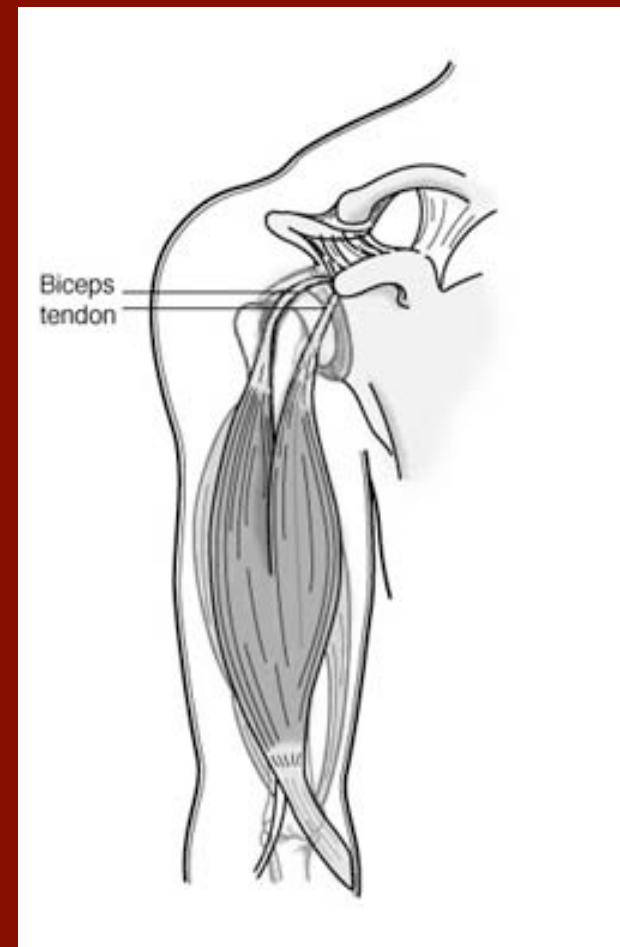
# Rotator Cuff Tendinitis



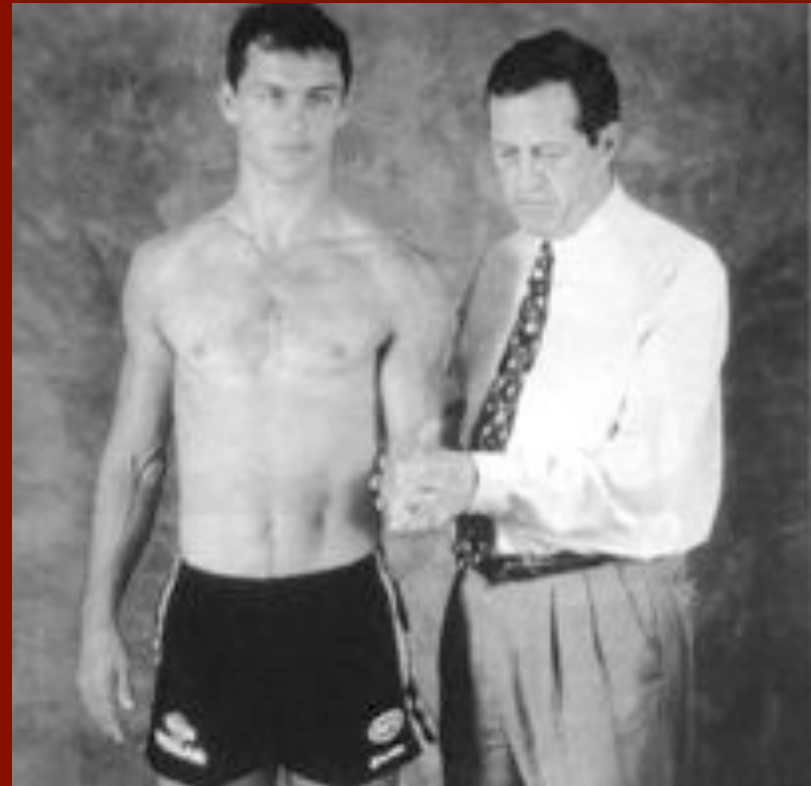
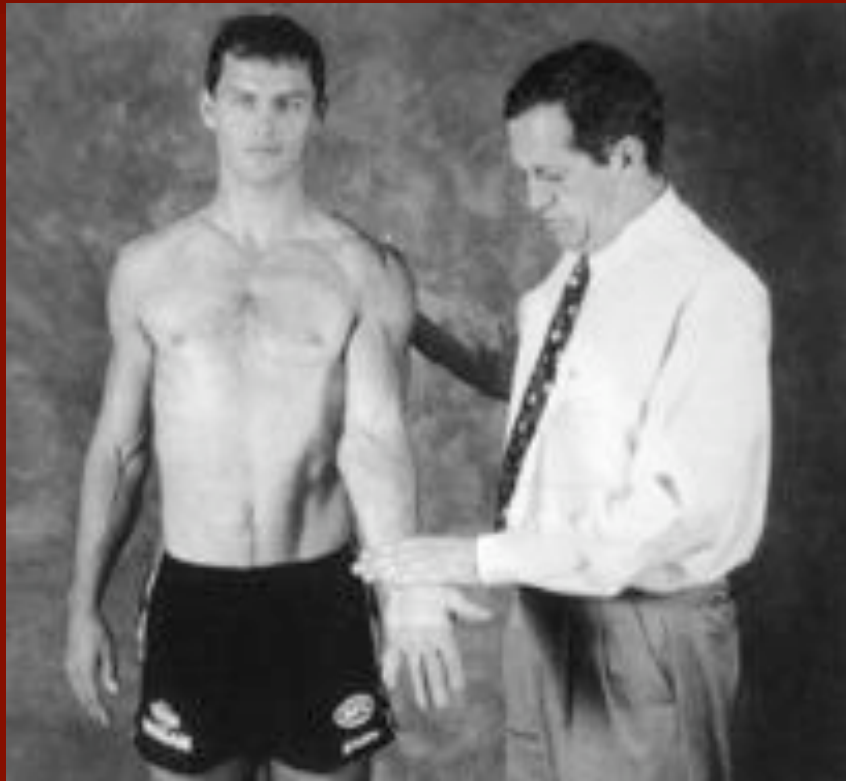
# Biceps tendinitis

- Swelling, inflammation in biceps tendon
- Pain upper, anterior shoulder in biceps groove
- Pain with shoulder, elbow flexion
- Pain with lifting
- Weakness due to pain

# Biceps tendinitis



# Biceps tendinitis



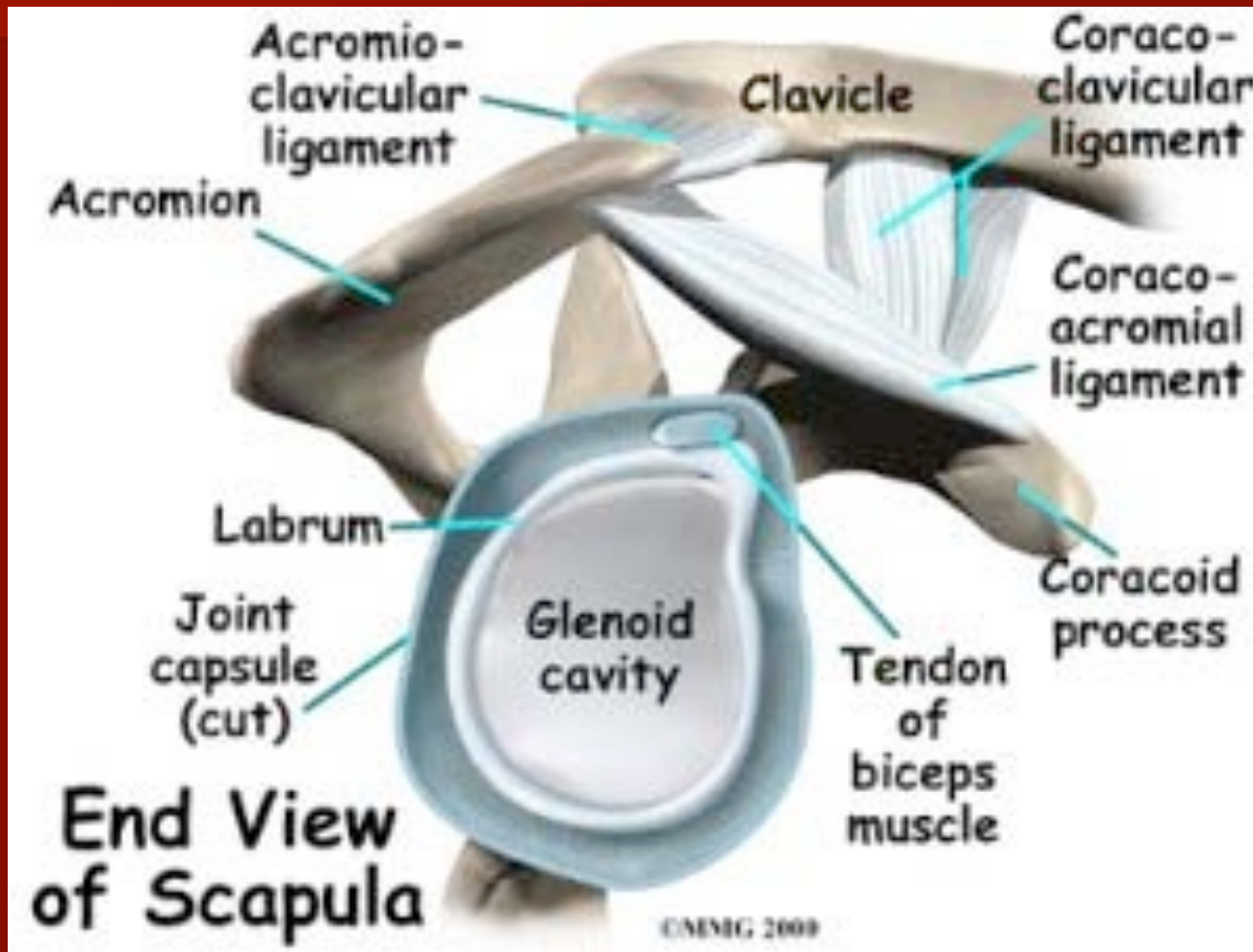
# Shoulder Tendinitis Treatment

- Rest
- Oral medications - NSAIDs
- Cuff strengthening
- Cortisone Injection
- Physical Therapy - modalities
- Surgery – Biceps tenodesis

# Impingement Syndrome

- Most common cause shoulder pain
- Overuse injury – repetitive overhead activity
- Pinching rotator cuff and bursa under arch with overhead and rotatory activity
- Result – tendinitis, bursitis
- Chronic – cuff tears

# Impingement Syndrome



# Impingement Syndrome

- Extrinsic – Primary Impingement
  - Direct compression of rotator cuff between
    - Greater tuberosity
    - Coracoacromial arch - Coracoacromial ligament and acromion
  - Osteophytes (spurs) from acromioclavicular joint may also contribute
  - Age related – less common in young athletes

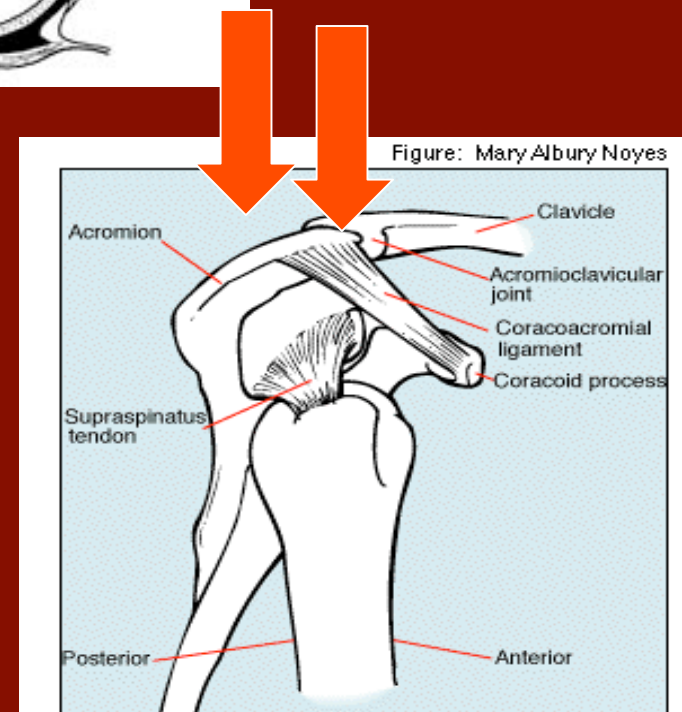
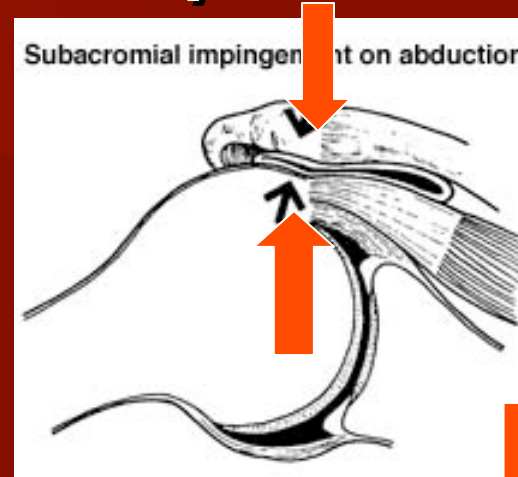
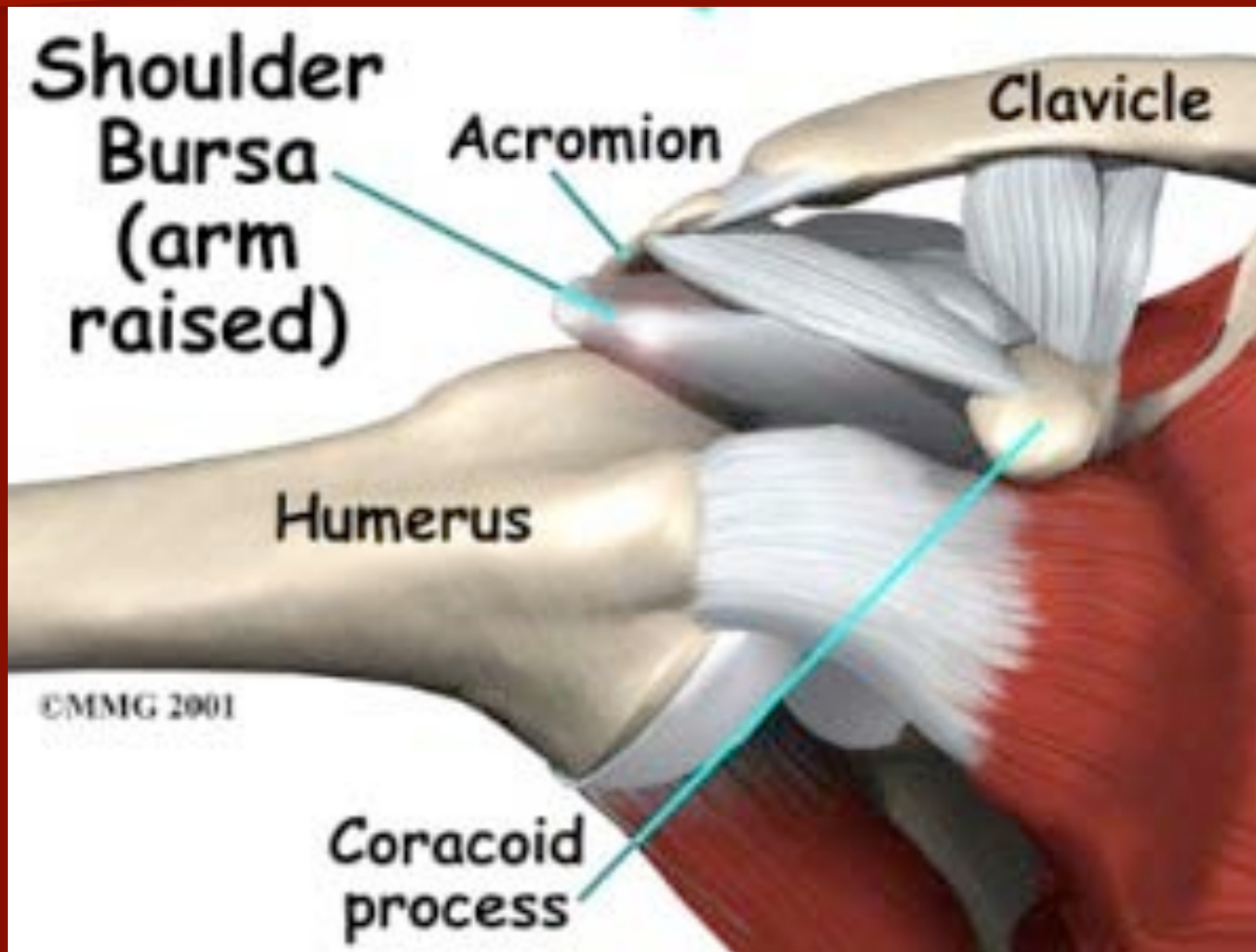


Figure 1. A lateral perspective of the shoulder demonstrating the coracoacromial arch. This includes the acromion, the acromioclavicular joint, the coracoid process, and the coracoacromial ligament, all of which form a roof over the supraspinatus tendon.

# Impingement Syndrome



# Impingement Syndrome



# Impingement Syndrome



Figure 3a A normal outlet view x-ray

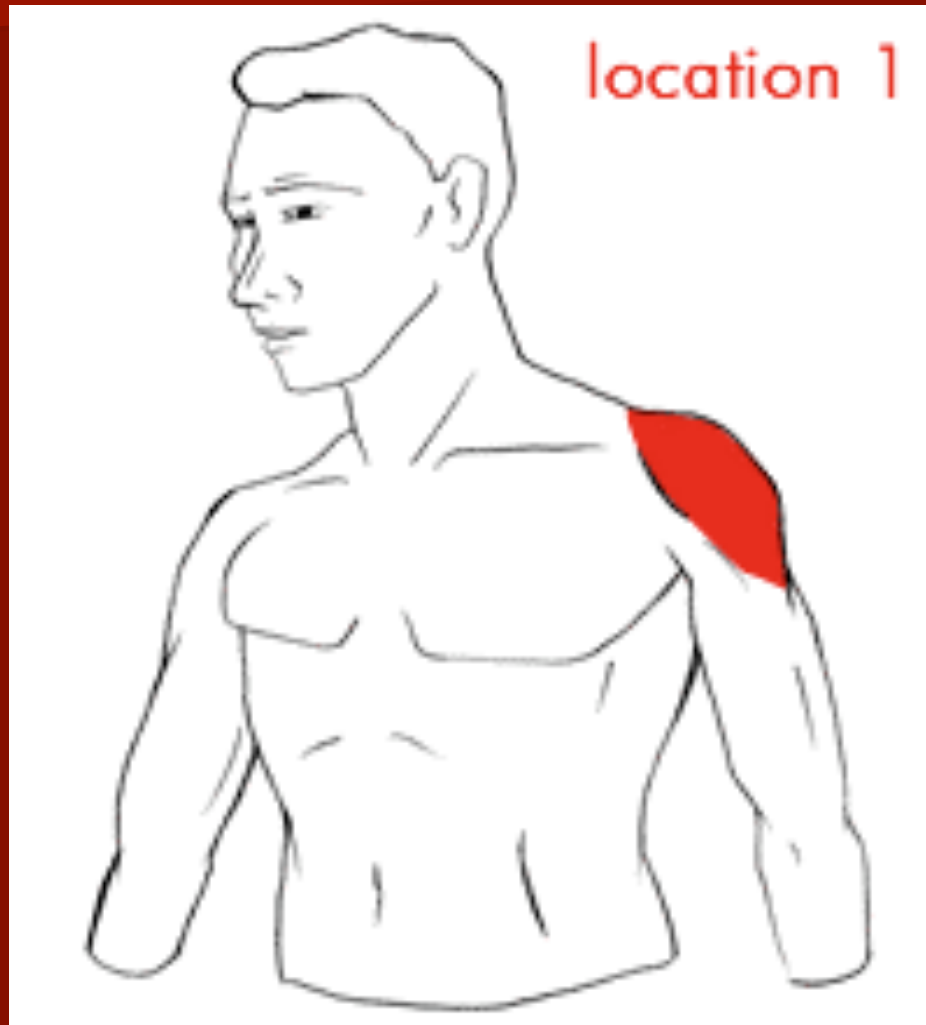


Figure 3b Abnormal outlet view showing a large anterior spur felt to cause impingement on the rotator cuff.

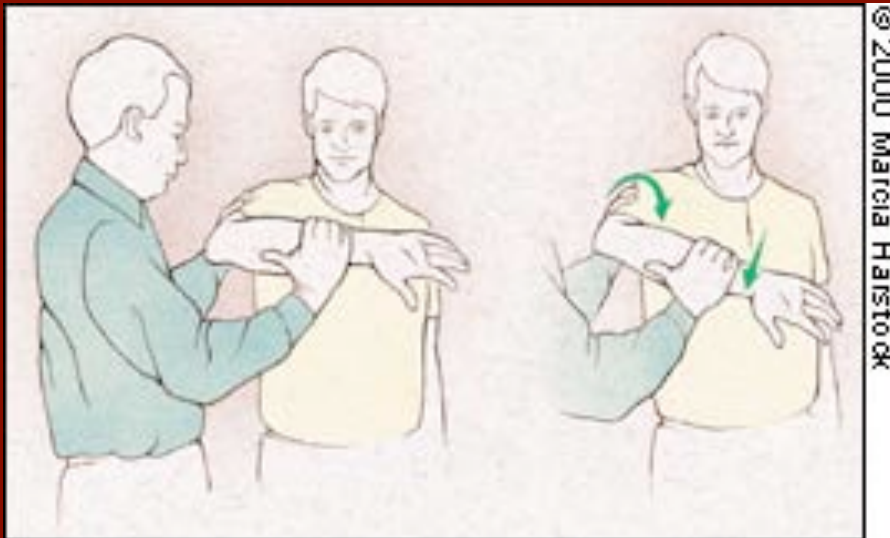
# Impingement Syndrome: Symptoms

- Pain upper, outer shoulder
- Radiation down upper arm
- Pain with overhead, rotatory shoulder motion – lifting, reaching
- Weakness due to pain
- Night pain

# Impingement Syndrome



# Impingement Signs



# Impingement Test

- Subacromial Injection

- Steroid/local anesthetic
- Diagnostic
- Therapeutic



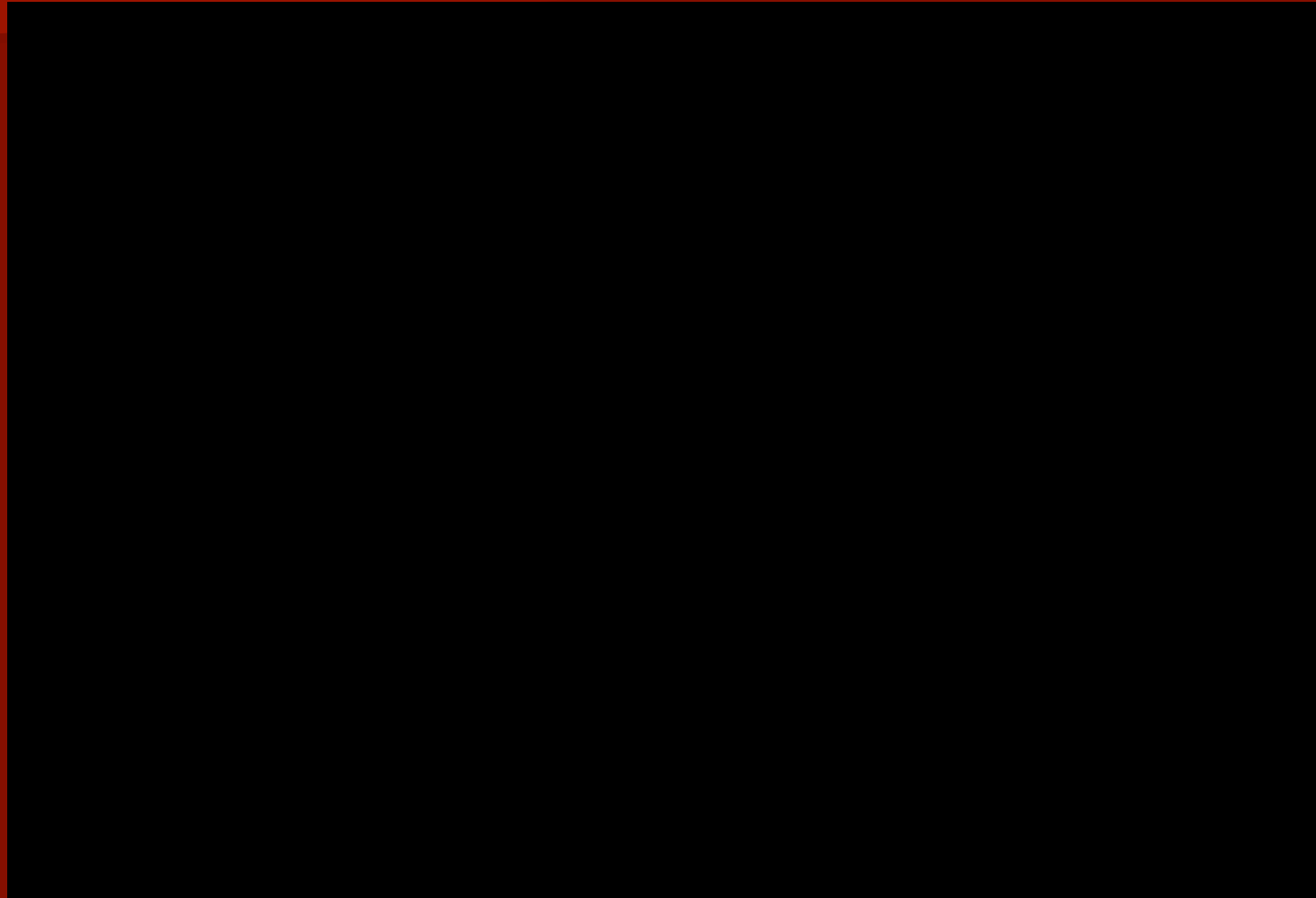
# Impingement Syndrome Treatment

- Rest
- Oral medications - NSAIDs
- Cuff stretching and strengthening
- Physical Therapy
- Cortisone Injection

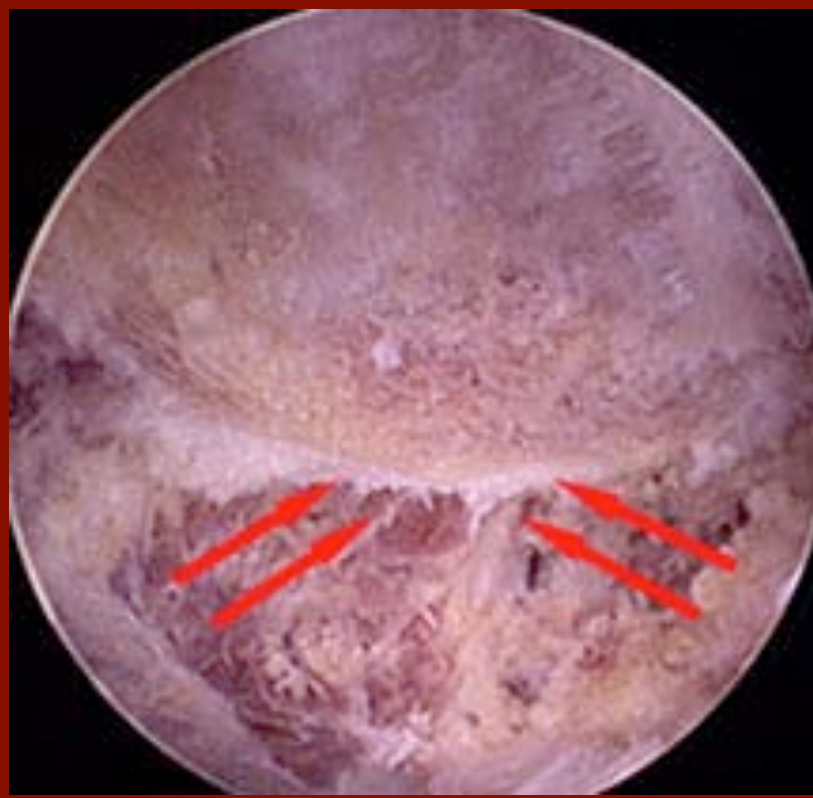
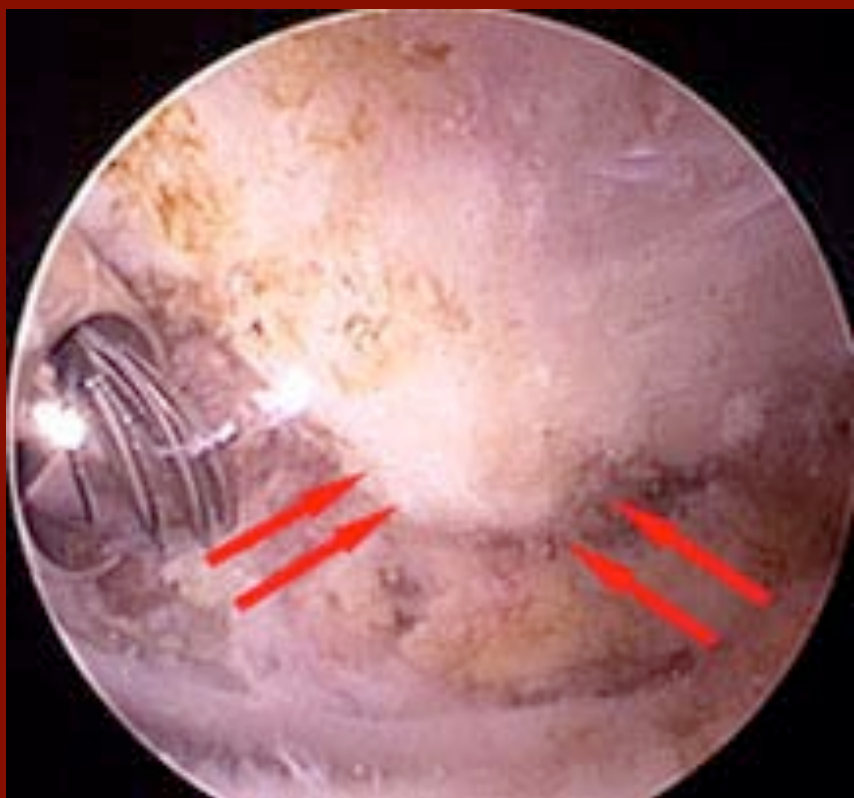
# Impingement Syndrome Surgery

- Subacromial Arch Decompression
  - Arthroscopy
  - Bursectomy
  - Spur Removal

# Impingement Syndrome Surgery



# Impingement Syndrome Surgery



# Impingement Syndrome Surgery

- Outpatient surgery
- Sling 1 week
- 45 minutes
- Postoperative Physical Therapy
- 4 – 6 week recovery

# Rotator Cuff Disease - Etiology

- **Extrinsic – Secondary Impingement due to Instability**
- **Instability in Throwing Athlete**
  - Increased motion & laxity in throwing athletes
  - Increased ER, decreased IR in dominant shoulder
  - 61% of pitchers and 47% of positional players have +sulcus sign (Bigliani)
- Repetitive microtrauma
- Increasing demand on dynamic stabilizers to maintain humeral head in glenoid
  - Fatigue, insufficient time for healing, attenuation
  - tendonitis and partial undersurface tears may ensue



# Rotator Cuff Disease - Etiology

Figure: Mary Albury Noyes

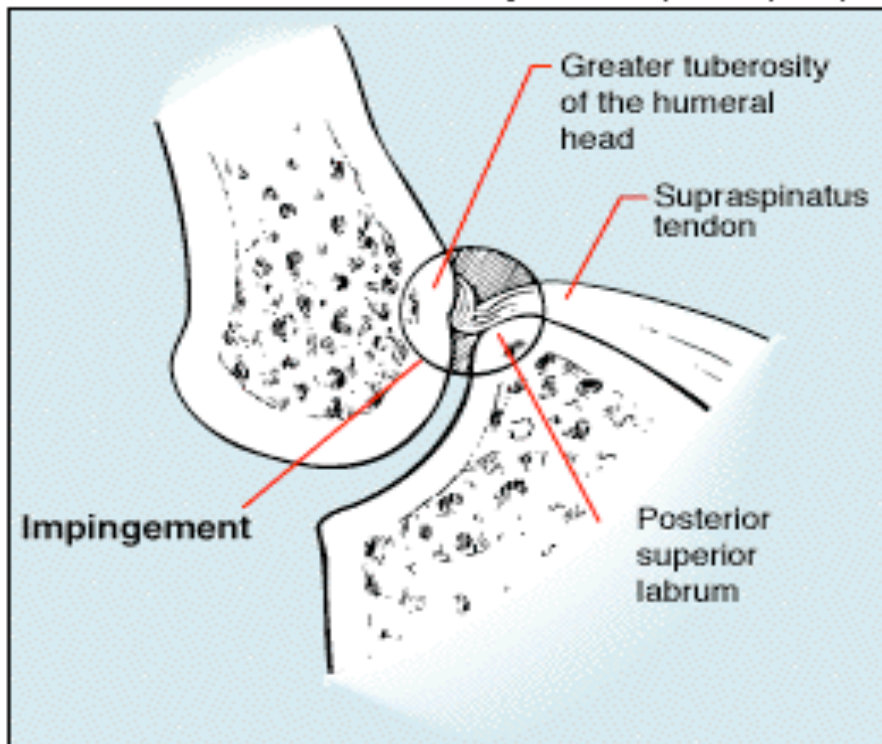


Figure 3. Posterior superior glenoid impingement occurs when the arm is abducted 90° and maximally externally rotated, and the posterior inferior aspect of the supraspinatus tendon is impinged between the greater tuberosity of the humeral head and the posterior superior labrum.

- **Internal impingement (Jobe)**
- **Throwing Athlete**
  - Contact between supraspinatus and posterior-superior glenoid margin
    - 90 degrees abduction
    - Maximum ER
  - Results in undersurface rotator cuff and posterior-superior labral injury
  - ? Instability as a cause of internal impingement

# Internal Impingement

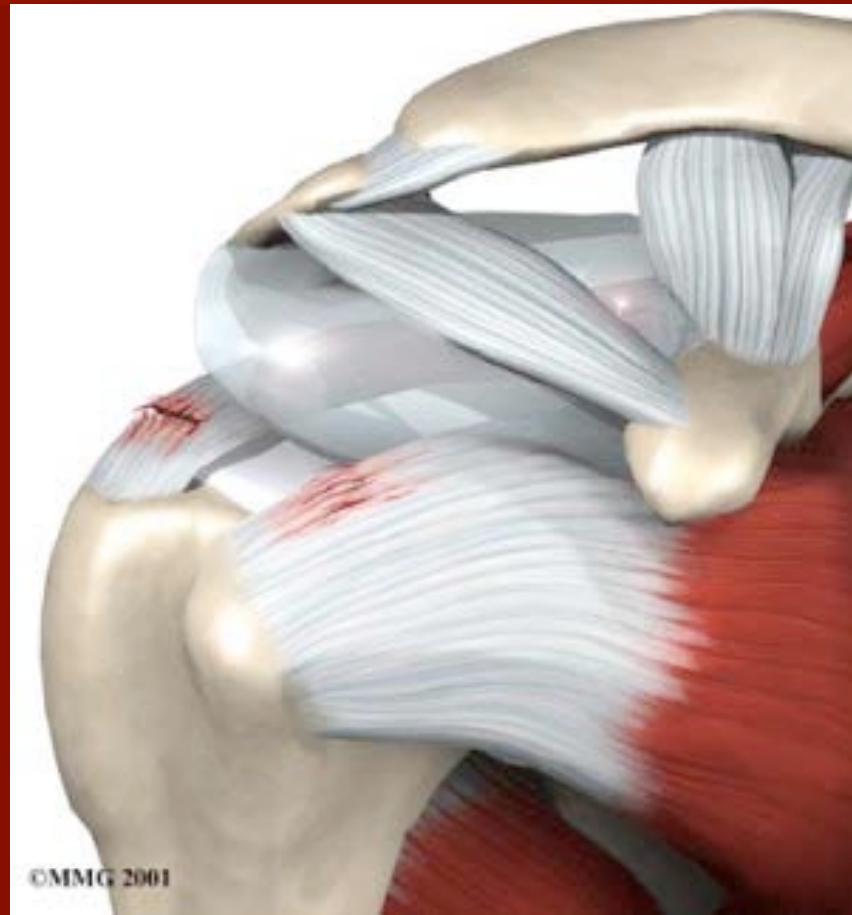


# Rotator Cuff Tear

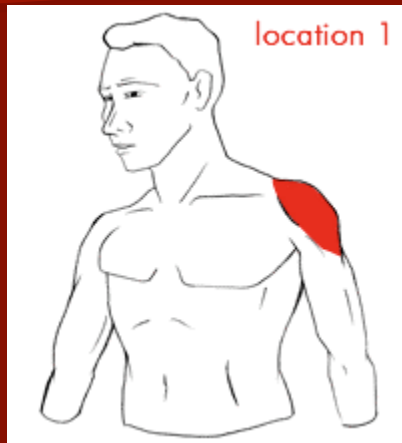
- Detachment of tendon from humeral bone
- Types
  - Acute – injury
  - Chronic – degenerative, impingement
- Partial or complete
- Supraspinatus tendon most common

# Rotator Cuff Tear: Diagnosis

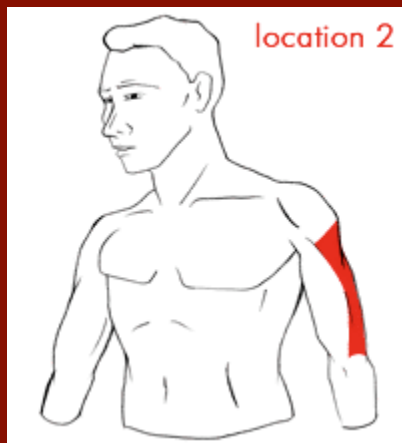
- Symptoms
- Examination
- Xrays
- MRI
- Arthrogram
- Arthroscopy



# Rotator Cuff Tear Symptoms



- Pain upper, outer shoulder
- Radiation down upper arm
- Pain with overhead, rotatory shoulder motion – lifting, reaching



- Weakness
- Drop arm sign
- Night pain

# Rotator Cuff Tear Exam

- Tenderness over outer shoulder
- Limited active motion
- Weakness to resistance
- Crepitus – grinding, popping
- Drop arm test

**DROP ARM TEST.** This test detects whether or not there are any tears in the rotator cuff (Fig. 71). First, instruct the patient to fully abduct his arm (Fig. 72). Then ask him to slowly lower it to his side. If there are tears in the rotator cuff (especially in the supraspinatus muscle), the arm will drop to the side from a position of about 90° abduction (Fig. 73). The patient still will not be able to lower his arm smoothly and slowly no matter how many times he tries. If he is able to hold his arm in abduction, a gentle tap on the forearm will cause the arm to fall to his side.



Fig. 71. Tears in the rotator cuff.

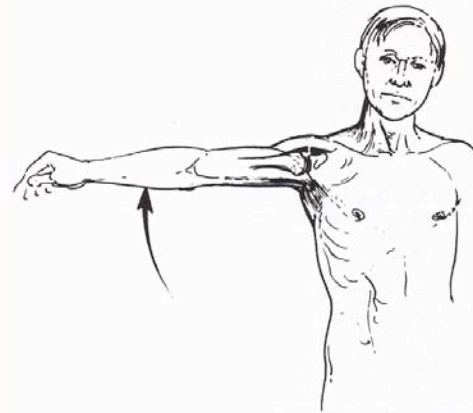


Fig. 72. The drop arm test: to determine if there are tears in the rotator cuff.

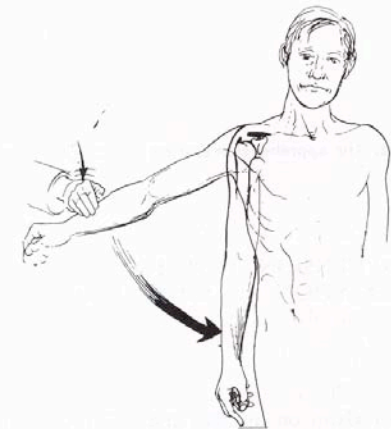
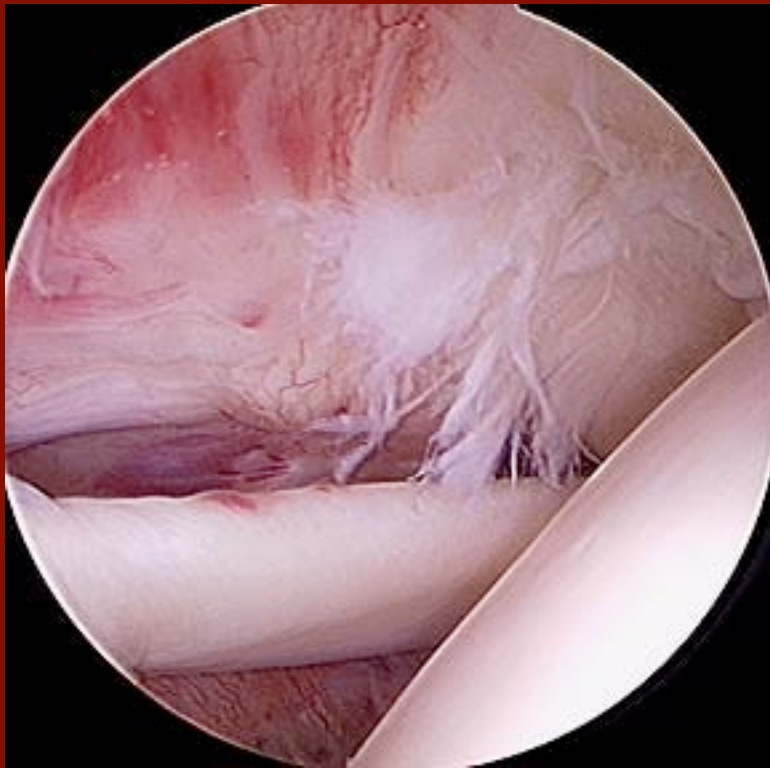


Fig. 73. If there are tears in the rotator cuff, the arm drops and the patient is unable to lower his arm slowly to his side.

# Rotator Cuff Tear: MRI



# Rotator Cuff Tear



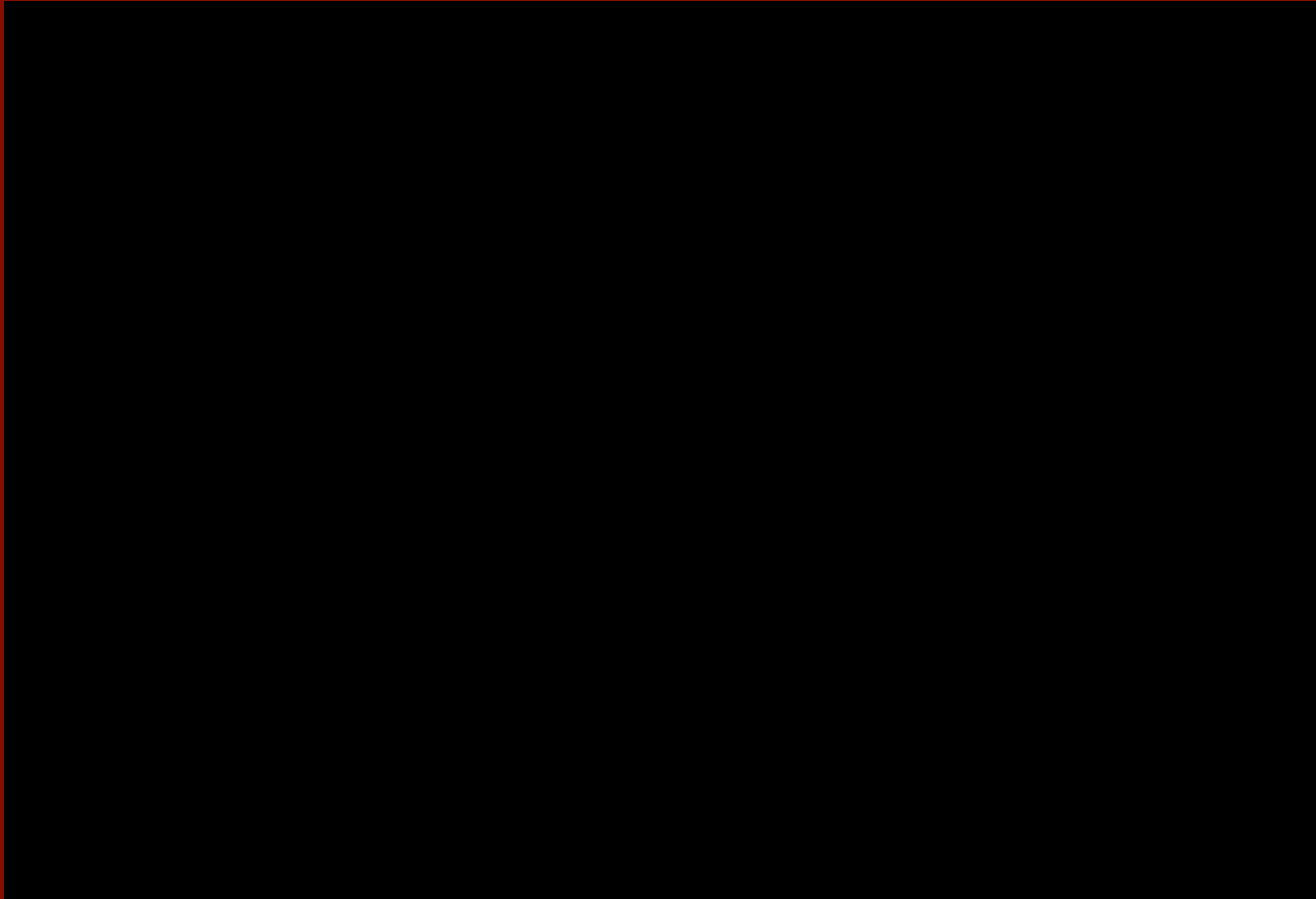
# Rotator Cuff Tear Treatment

- Dependent upon location, size, age
- Partial tears often respond to conservative treatment
- Full thickness tears often require surgery
- Chronic, massive tears sometimes irreparable

# Rotator Cuff Tear Surgery

- Open
- Arthroscopic
- Often combined with decompression

# Rotator Cuff Tear Surgery



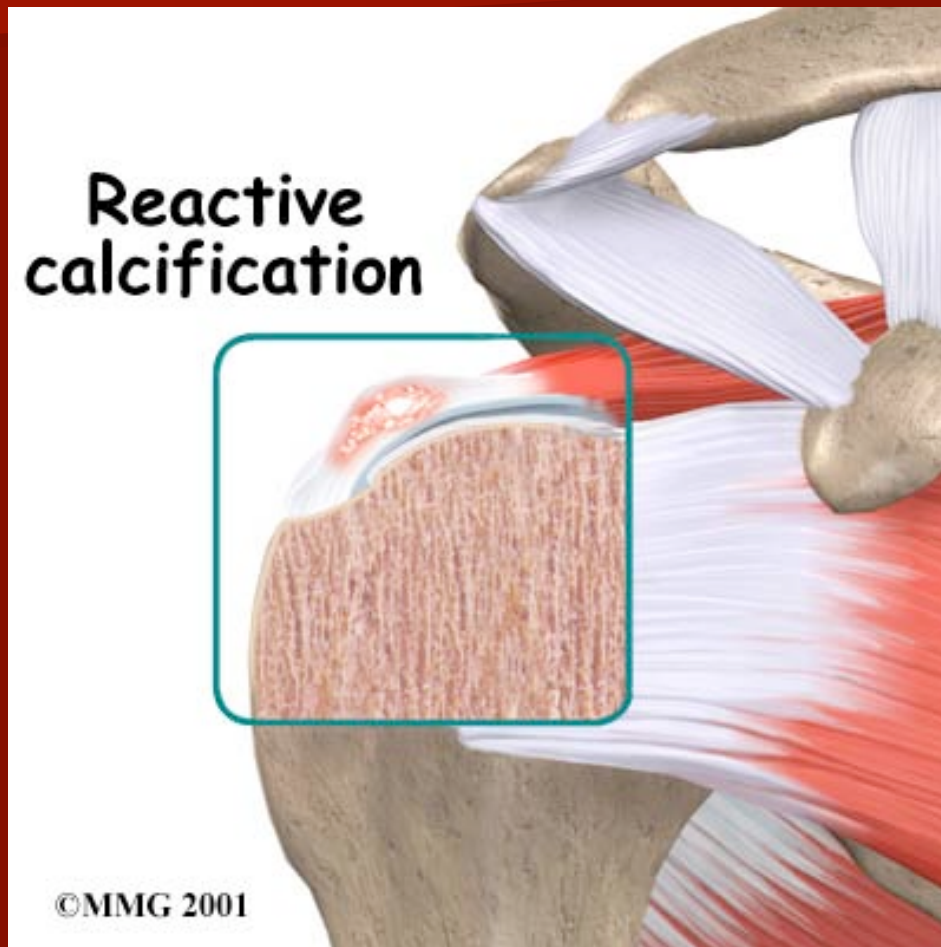
# Rotator Cuff Tear Surgery

- Recovery dependent on size of tear
- Sling 2 – 4 weeks
- Physical Therapy
- Recovery 12 – 16 weeks
- Goal – pain relief

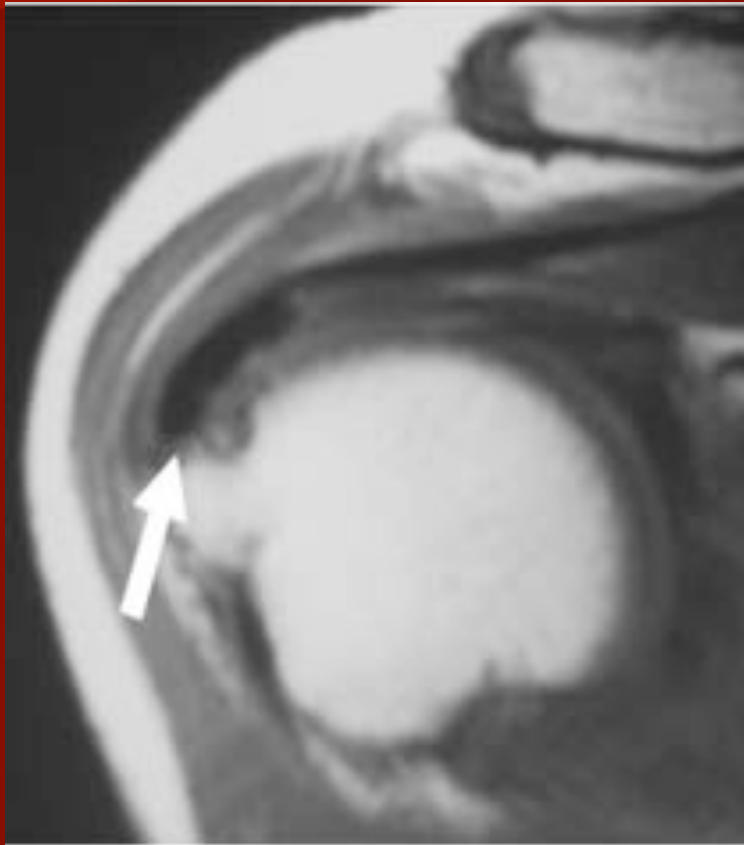
# Calcific Tendinitis

- Calcium deposits within rotator cuff tendon
- Response to irritation, sometimes cause unclear
- Florid inflammatory reaction when calcium released into bursa
- Intermittent flares between relatively asymptomatic periods

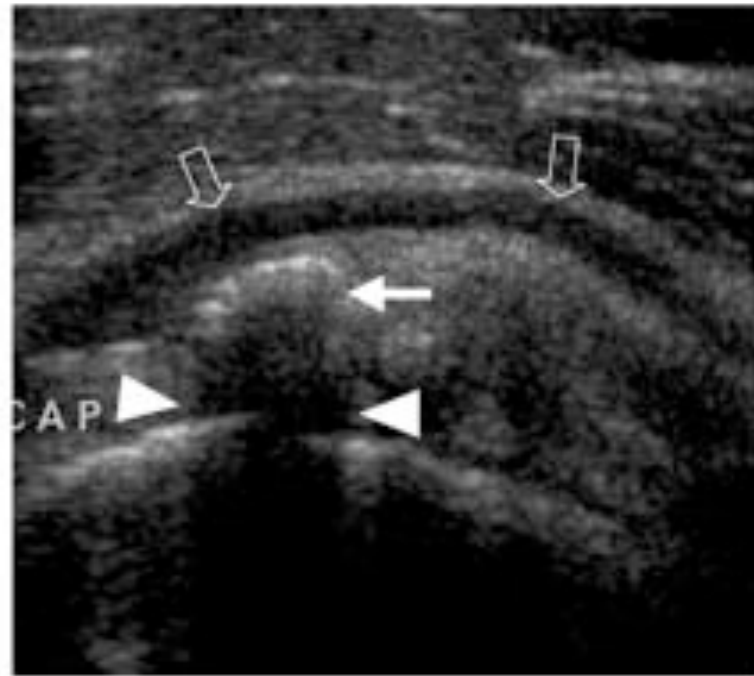
# Calcific Tendinitis



# Calcific Tendinitis



(a)

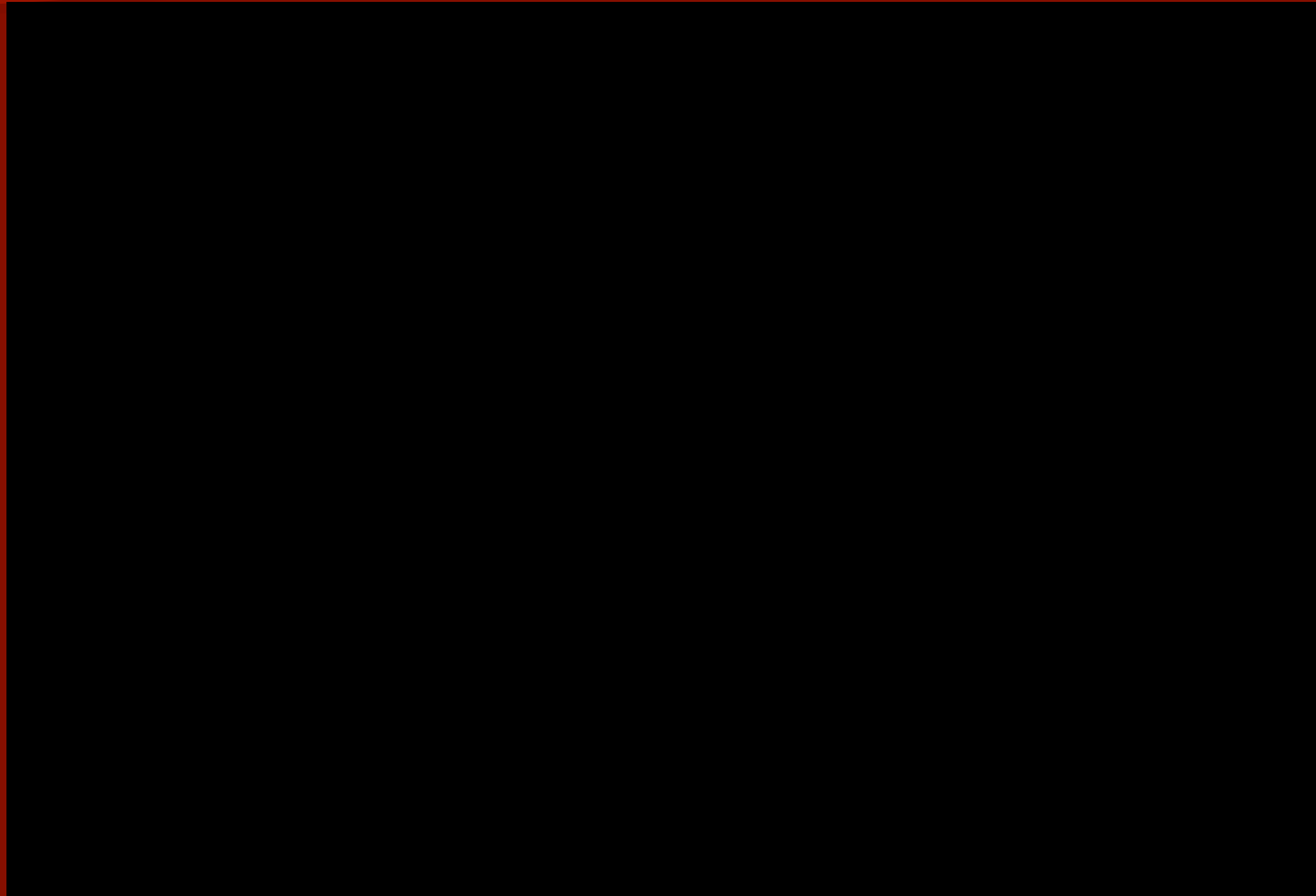


(b)

# Calcific Tendinitis Treatment

- Cortisone injection for acute flares
- Needle aspiration
- Observation
- Shock wave therapy
- Arthroscopic debridement

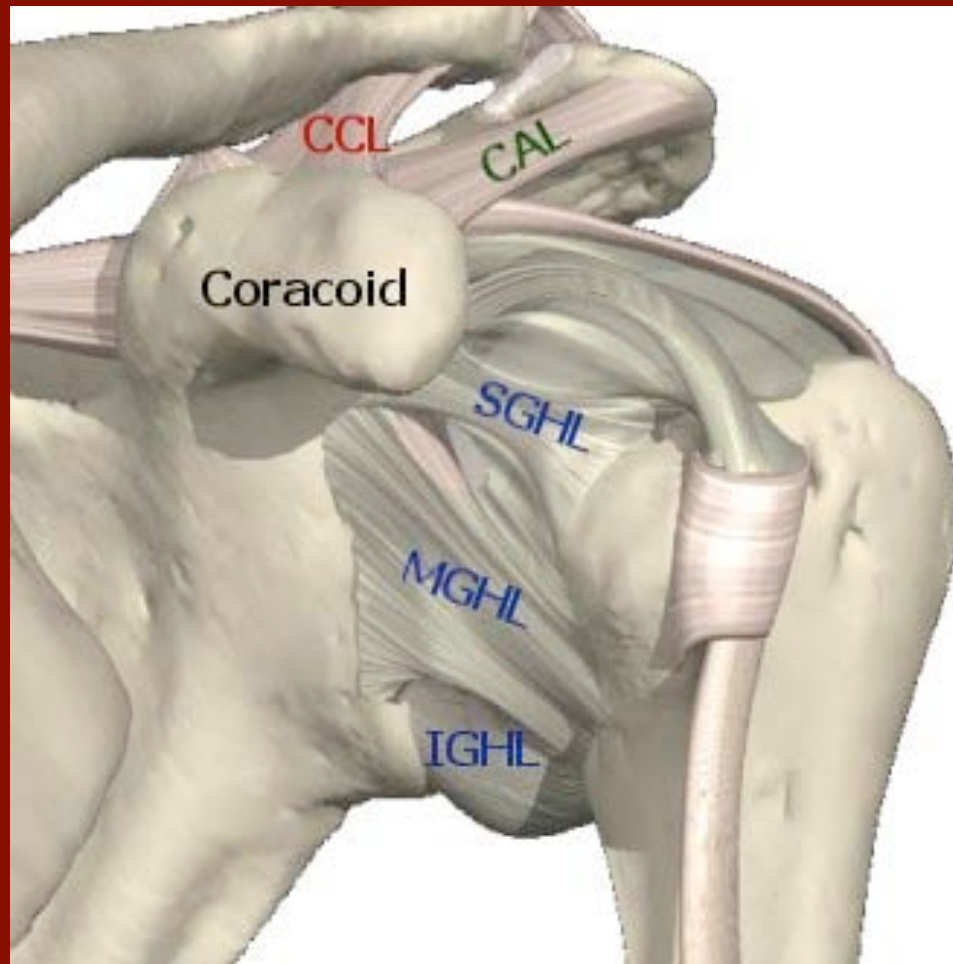
# Calcific Tendinitis



# Adhesive Capsulitis “Frozen Shoulder”

- Insidious pain and loss of motion in shoulder
- Thickening, scarring joint capsule
- Women between 40 and 70
- Smokers, diabetics
- Etiology
  - Primary – cause unknown
  - Secondary – trauma, immobilization

# Adhesive Capsulitis “Frozen Shoulder”



# Adhesive Capsulitis “Frozen Shoulder”

- Three phases:

 Freezing (6 wks to 9 months) – painful

 Frozen (4 to 9 mos) – stiff

 Thawing (5 mos to 2 yrs) – slow return of motion

# Adhesive Capsulitis “Frozen Shoulder”

- Most patients will improve with time
  - May take up to three years
- Treatment
  - NSAIDs
  - Cortisone Injections
  - Physical Therapy – capsular stretching
  - Modalities – heat

# Adhesive Capsulitis “Frozen Shoulder”

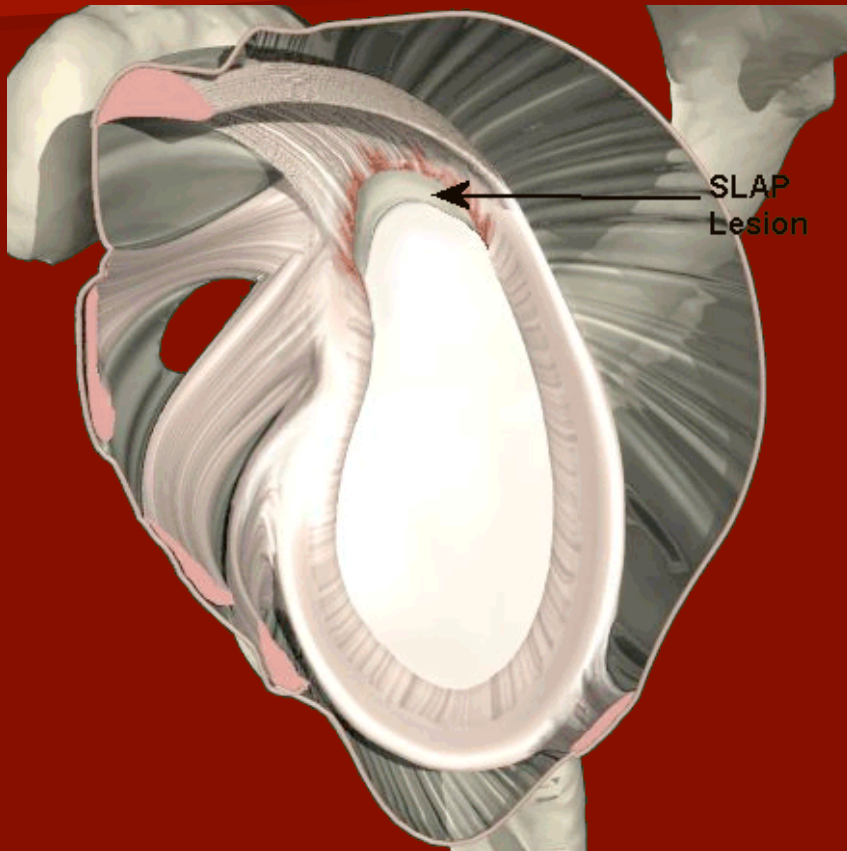
- Surgery – speeds recovery time
  - Manipulation under anesthesia
    - Manual tearing capsular adhesions
    - Followed by aggressive P.T.
  - Capsular release
    - Arthroscopic
    - Division of thickened capsule
  - Often in combination

# Labral Tears

- Tear of cartilage rim which surrounds socket
- Two main types:
  - Bankart
    - Anterior
    - dislocations
  - SLAP
    - Superior
    - Involves biceps



# Labral Tears



# Labral Tears: Injury

- Falling on an outstretched arm -- dislocation
- Direct blow to the shoulder
- Sudden pull, such as when trying to lift a heavy object
- Violent overhead reach, such as when trying to stop a fall or slide

# Labral Tears: Symptoms

- Pain, usually with overhead activities
- Catching, locking, popping or grinding
- Occasional night pain or pain with daily activities
- A sense of instability in the shoulder
- Decreased range of motion
- Loss of strength

# Labral Tears: Diagnosis



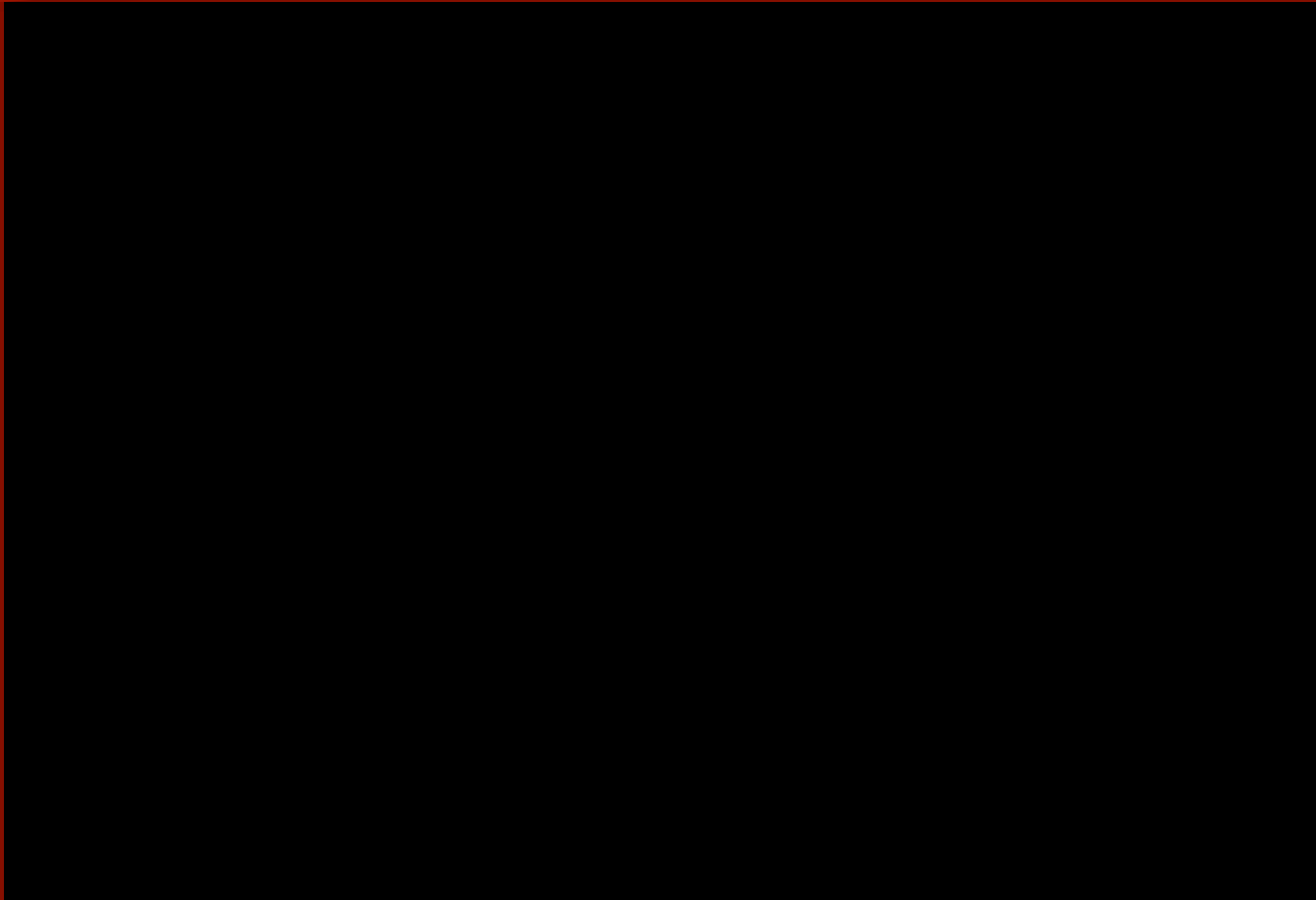
# Labral Tears: Treatment

- Usually surgical

 Debridement

 Reattachment

# Labral Tears: Surgery



# Labral Tears: Surgery



# Labral Tears: Surgery

## ■ Recovery

- Sling up to 4 weeks
- Physical Therapy
- ADL's 8 – 12 weeks
- Sports (golf, tennis) 12 – 16 weeks

# Shoulder Arthritis

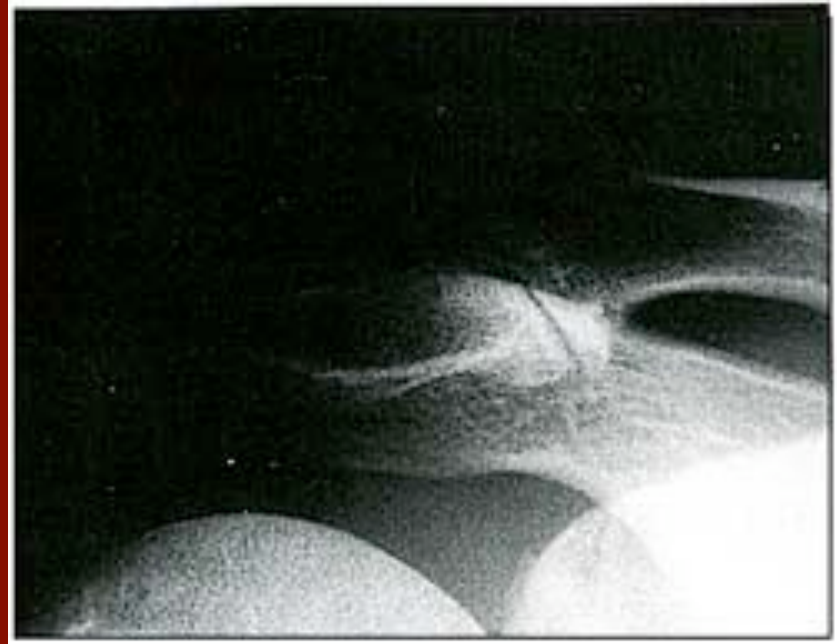
- Loss of smooth joint cartilage
- Two sites:
  - AC joint
  - Glenohumeral joint



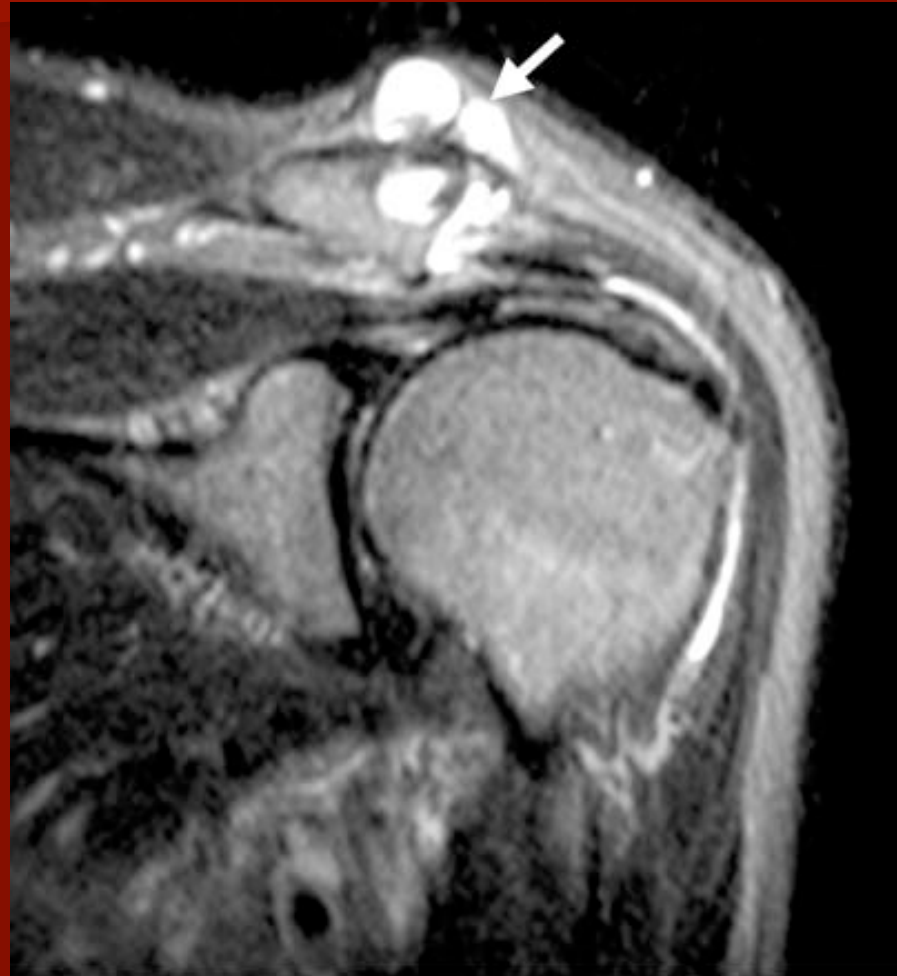
# AC Arthritis

- Acromioclavicular joint arthritis
  - Common but not always symptomatic
  - Aching pain at end clavicle
  - Pain with cross arm/overhead activity
  - Difficult to lay on affected side
  - Grinding, popping with shoulder motion

# AC Arthritis



# AC Arthritis



# AC Arthritis: Treatment

- Asymptomatic – Observation
- Symptomatic
  - Rest
  - Anti-inflammatory medicine
  - Cortisone Injections
  - Surgery

# AC Arthritis: Surgery



# AC Arthritis: Surgery



# AC Arthritis: Surgery

## ■ Recovery

- Sling 1- 2 weeks
- Physical Therapy
- Return activities 4 – 6 weeks

# Glenohumeral Arthritis

- Main shoulder joint
- Less common than hip and knee
- Non weightbearing joint
- Multiple types:
  1. Osteoarthritis
  2. Rheumatoid arthritis
  3. Posttraumatic Arthritis



# Glenohumeral Arthritis

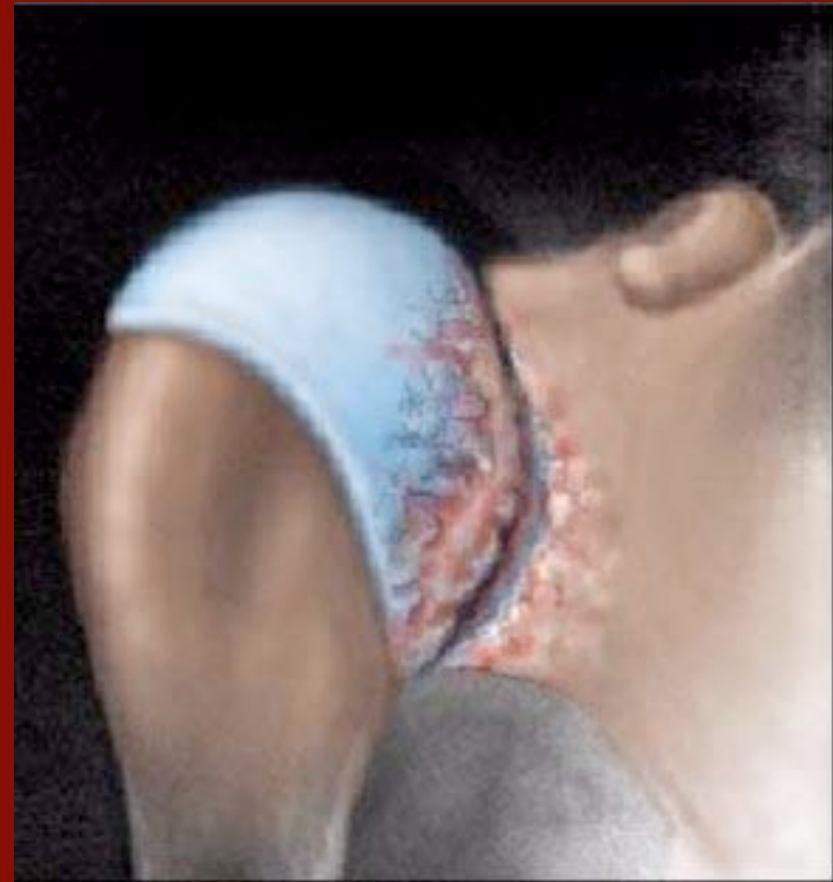
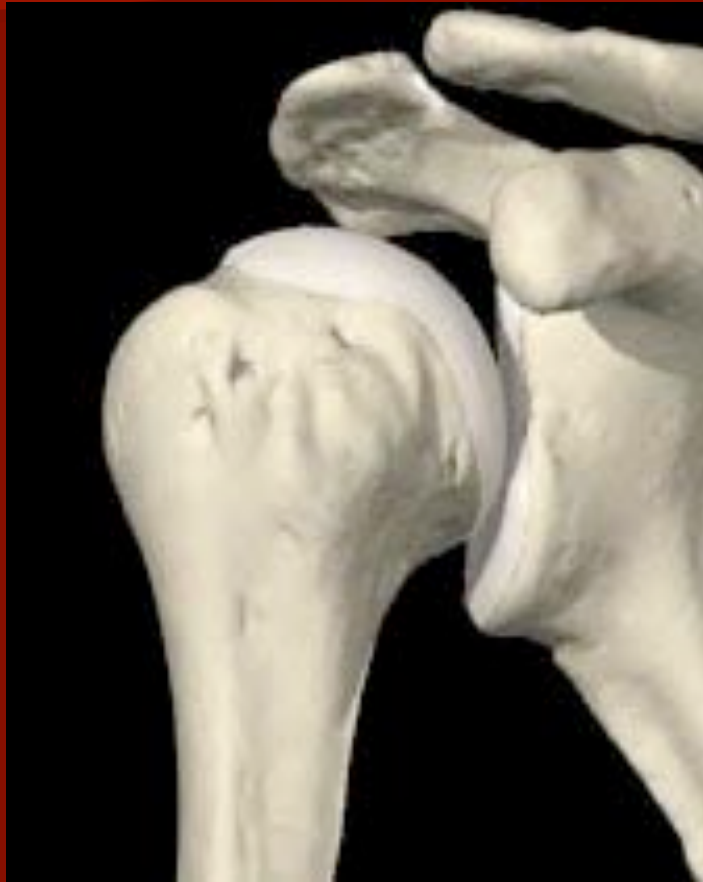
## ■ Symptoms

- Pain
- Stiffness
- Crepitus
- Weakness

# Glenohumeral Arthritis



# Glenohumeral Arthritis



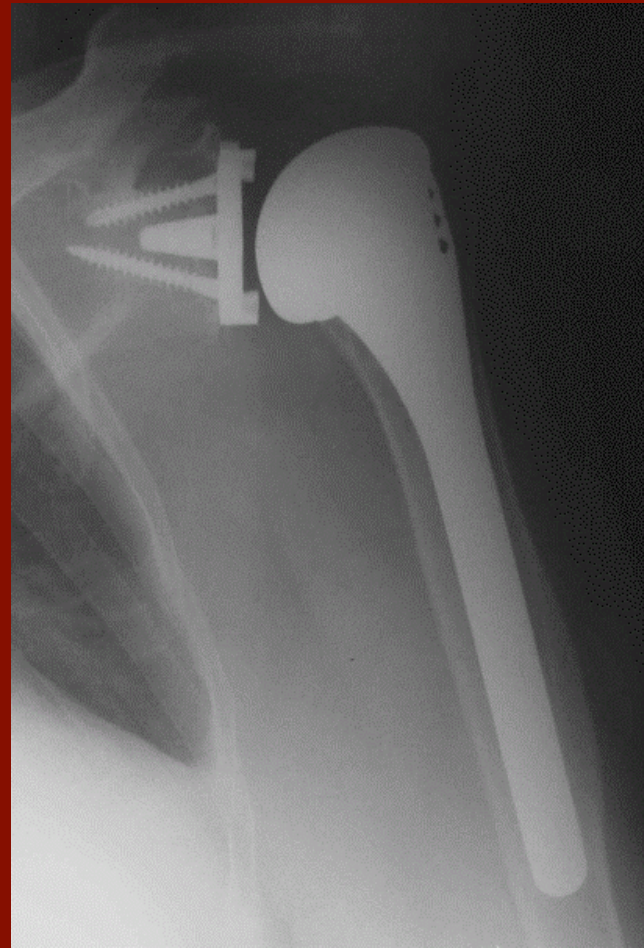
# Glenohumeral Arthritis

- Rest or change activities to avoid provoking pain
- Nonsteroidal anti-inflammatory medications
- Modalities – Ice or heat
- Rheumatoid arthritis – disease-modifying drugs
- Corticosteroid injections
- Dietary supplements – glucosamine and chondroitin sulfate

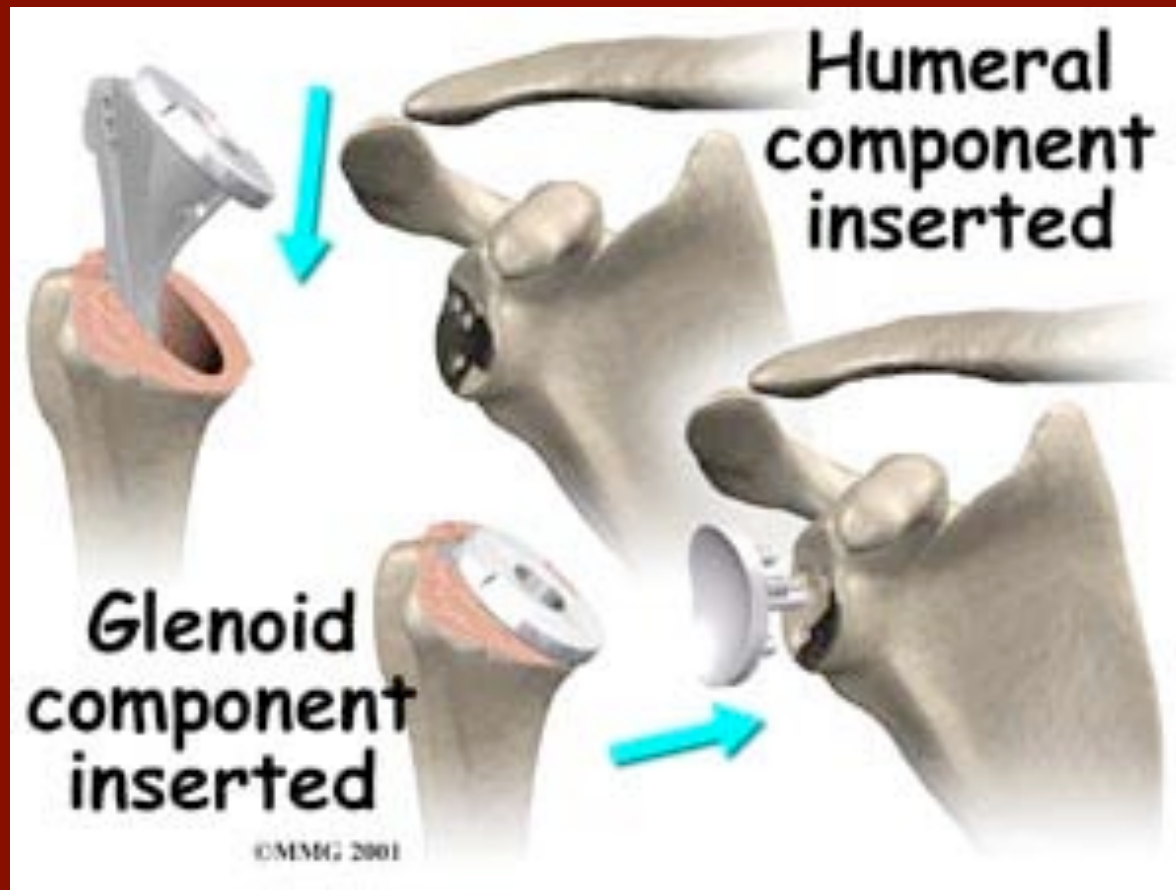
# Glenohumeral Arthritis: Surgery

- Arthroscopic debridement – palliative
  
- Joint replacement:
  1. Hemiarthroplasty
  
  2. Total Shoulder Arthroplasty

# Glenohumeral Arthritis: Surgery



# Glenohumeral Arthritis: Surgery



# Glenohumeral Arthritis: Surgery



# Glenohumeral Arthritis: Surgery

- Rehab
  - 1- 2 day hosp stay
  - Sling 2 – 4 weeks
  - Postop PT day 1
  - ADL's 8-12 weeks
- Outcomes
  - > 90% good to excellent results
  - > 90% lasting at least 10 years
- Glenoid loosening main complication
- Good Pain relief – strength and ROM less predictable

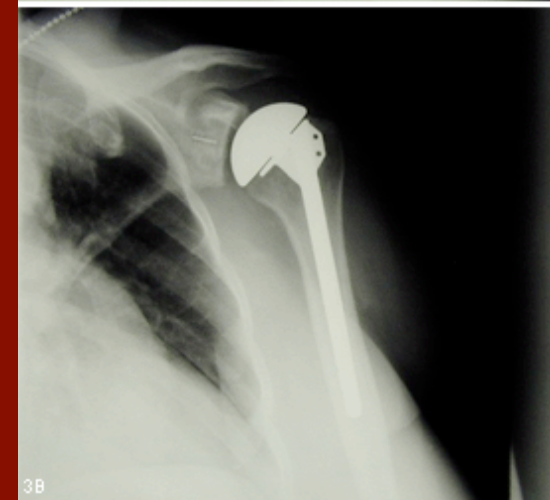
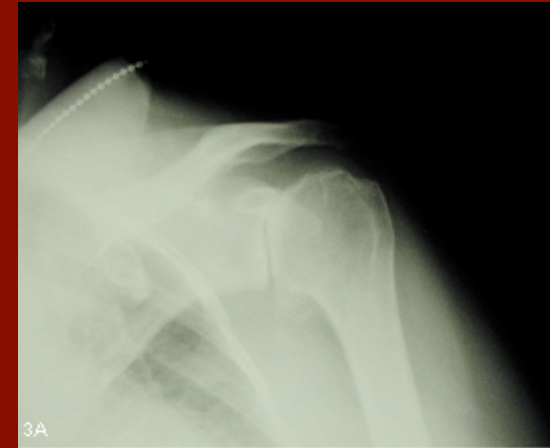


Figure 3. X-rays before and after conventional total shoulder replacement surgery for osteoarthritis .

# Thank You!



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