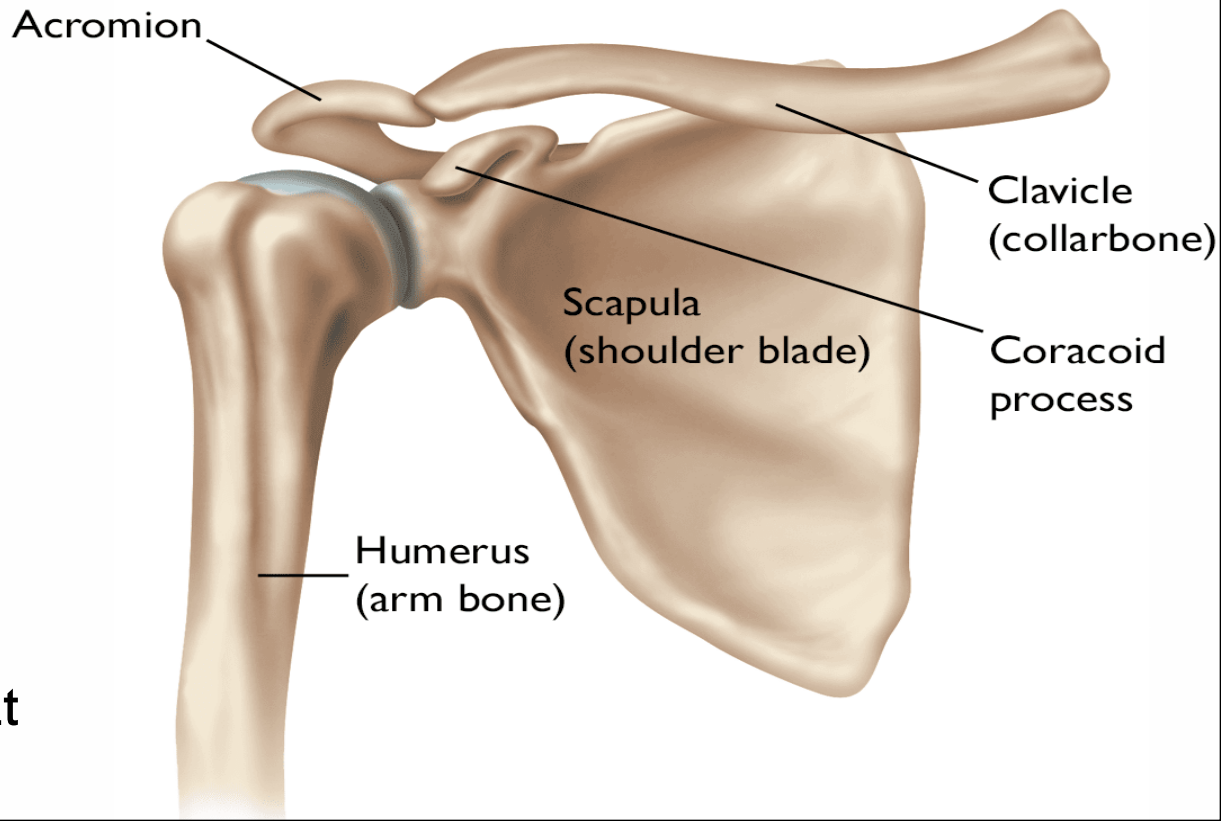
SHOULDER DISORDERS

ANATOMY OF THE SHOULDER

- Shoulder joint is a ball and socket joint

- The glenohumeral joint moves 120 °while the scapulothoracic moves 60° (so every 2° movement in glenohumeral joint, scapulothoracic joint will move 1°). So they move together in smooth motion



Shoulder girdle components :

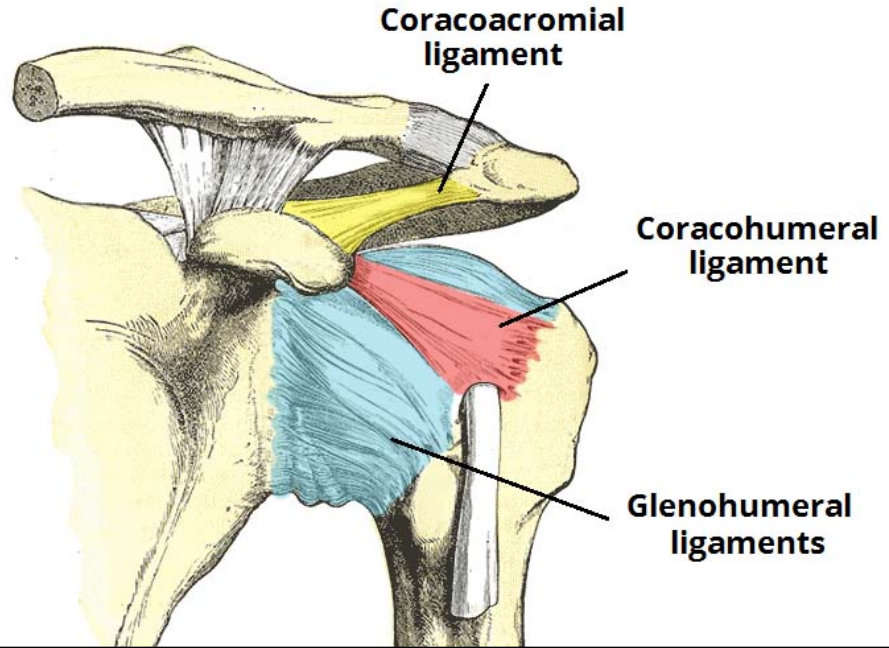
- Bones : Scapula, Humerus, Clavicle

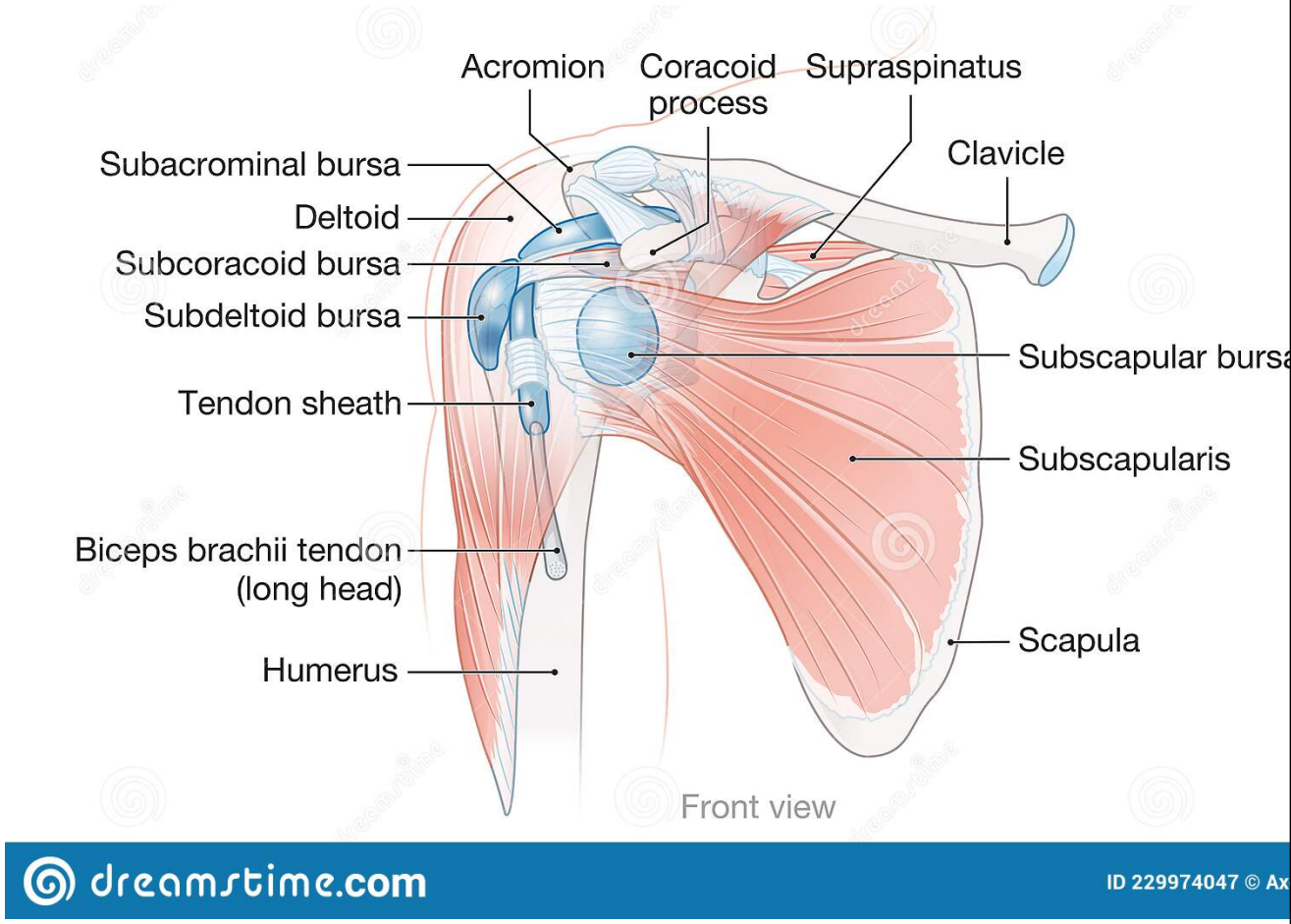
- Ligaments : Glenohumeral Ligaments
  Coraco-acromial Ligament.
  Coraco-clavicular Ligaments.
  Transverse Humeral Ligament

- **Rotator Cuff Muscles** : subscapularis, supraspinatus, infraspinatus, teres minor

- **Associated muscles** : deltoid, biceps, pectoralis.

- **Joint Capsules**





Shoulder joint are stabilized mainly by muscles, Deltoid is the major one

Rotator cuff muscles main work is stabilization, deltoid is responsible for shoulder joint movement .

The major muscle that moves glenohumeral joint is deltoid

Compared to the hip joint , the shoulder joint is less stable but with more range of motion .

Only ⅙ of the joint is bony sphere, ¼ of the joint including the labrum that's why its less stable than the hip

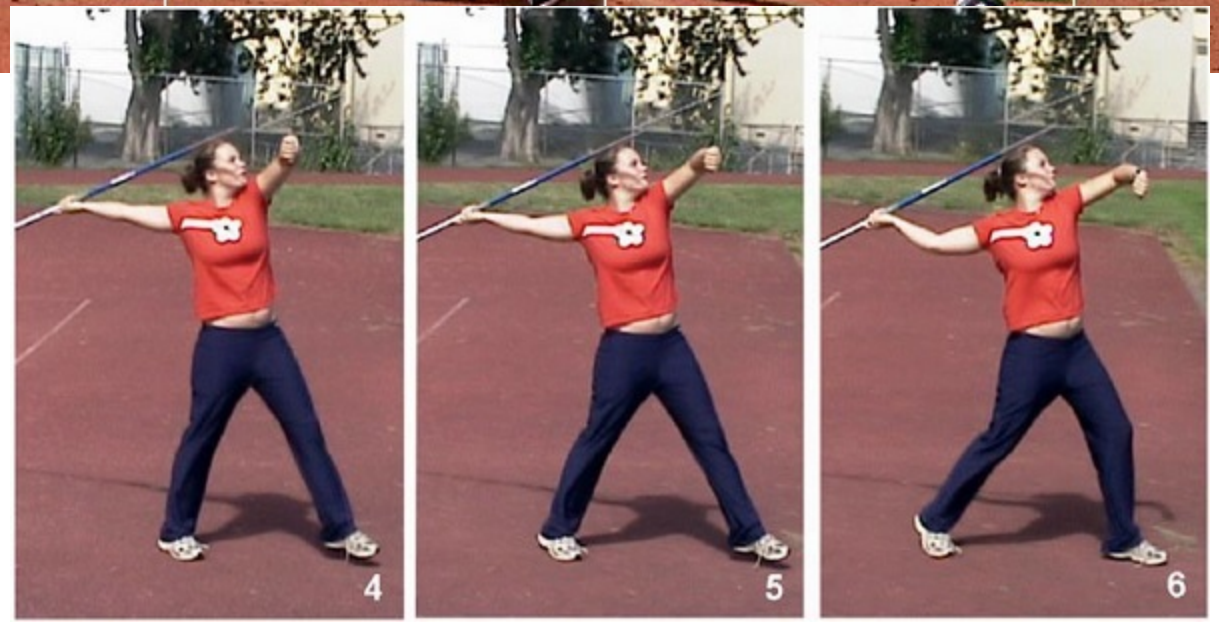
Antigravity muscles are stronger , and those muscle are more (stronger) in the post, part of the shoulder → so anterior part is weaker → anterior dislocation is the commones

In America the incidence of shoulder dislocation is 2% but less in athletes .

SHOULDER DISLOCATION

- ● Definition : Separation of the humerus from the scapula at the glenohumeral joint.
- ● Epidemiology :Bimodal distribution: ○ Men in 20-30 yrs ○ Women 61-80 yrs → hormonal change → less osteoblast , less collagen
- ● Most commonly dislocated large joint (mostly anteriorly)
- ● Less common in children as their epiphyseal plate is weaker and tends to fracture before dislocating → almost never if
- The main mechanism of dislocation is throwing position (late cooking phase , which is abduction, external rotation and extension). Handball sport is the most common cause that causes dislocation in western countries.

throwing position at different sports :



Shoulder dislocation has 4 types:

1.Anterior dislocation (95% of cases , Sub-coracoid dislocation(most common)

Mechanism a)Indirect: fall on abducted extended and externally rotated shoulder
b) Over-head throwing. e.g. Hand Ball
c)Direct blow from behind

2. Posterior dislocation (5% of cases) → in electric shock or convulsion

3. Inferior dislocation (less than 1%, rare)

4. Multidirectional (habitual): due to ligament laxity, its painless.

Presentation :

- Severe pain due to disruption of the capsule which will irritate the nerves

- Decreased range of motion (the patient can't move his arm) 122

- deformity of shoulder → lateral border becomes square due to humeral head dislocation, glenoid can be palpated under the acromion +palpable humeral head anteriorly “normally the shoulder has a round contour because of intact glenohumeral joint”

- History of : falling down/trauma/convulsions or an electrical burn (post. dislocation)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Physical examination:

- Shoulder is "squared off" (boxlike) with loss of deltoid contour compared with contralateral side.

- Humeral head is palpable anteriorly (subcoracoid region, beneath the clavicle).

- Patient resists abduction and internal rotation and is unable to touch the opposite shoulder. → **positive Apprehension test**

- We should also examine the neurovascular bundle:

vascular : radial and ulnar pulse +capillary refill

Neu

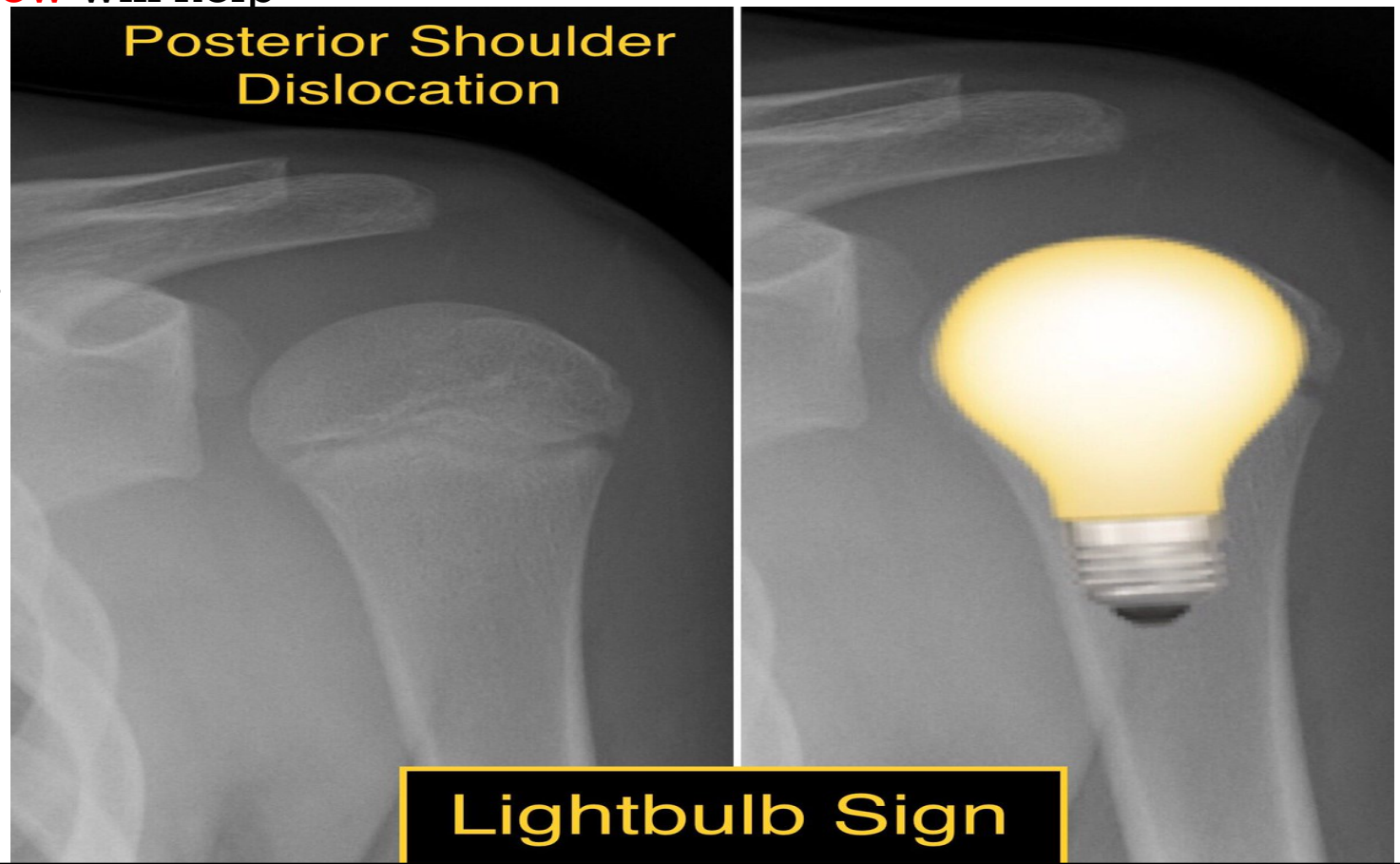
	Motor	sensory
Axillary nerve	-	On the skin of lower half of deltoid
Radial nerve	Extension of MCP	in the first web space
Median nerve	OK sign	Pulp of index
Ulnar nerve	Abduction and adduction to the fingers of the hand	Pulp of little finger

Imaging :

X-ray: 2 views: AP and axillary or Scapular view

- Anterior dislocation can be diagnosed by AP view, but posterior dislocation can't be detected in AP view so the axillary view will help

AP view may show a light bulb appearance (which is the humeral head) :



- We should do x-ray specially in the first-time dislocation to exclude fracture

Ant dislocation is obvious on x-ray

Post dislocation might be tricky to see on x-ray

Treatment → its an Emergency

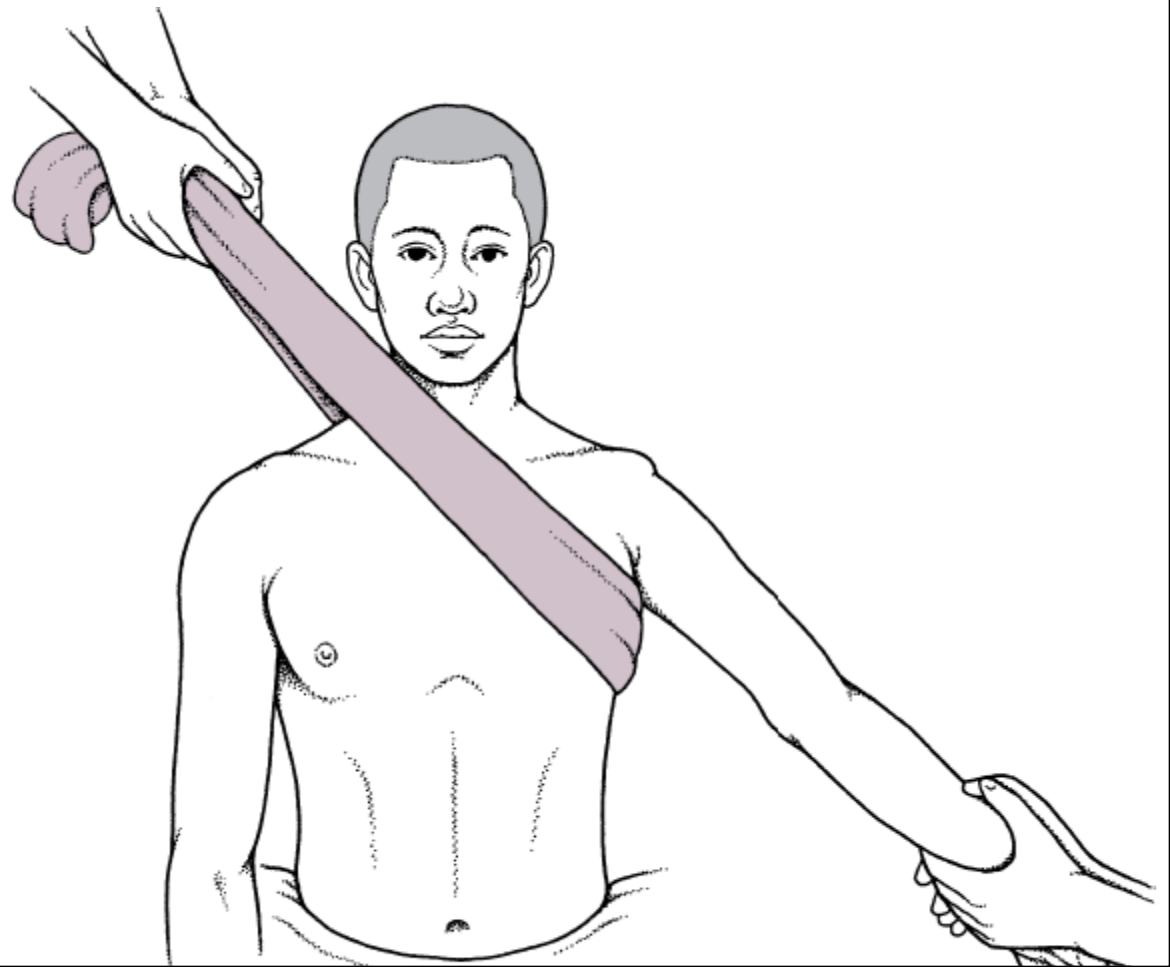
~By Reduction - closed reduction (traction-countertraction) .

~It's a painful process so before doing it we give the patient midazolam and morphine

-In traction-countertraction, the hand is attracted (pulled) in its same position, we do NOT do rotation on the hand, this has a risk of fracture

- Repeat the X-ray after relocation
- Immobilize in a sling for 1-3 weeks /NSAIDS /Apply ice
- Rehabilitation (to regain the full ROM)

traction-countertraction:



Complications:

- Depend on age.
- Around age of 20 : bankart lesion (most common), it is caused by avulsion of labrum, anterior and inferior glenohumeral ligaments are incompetent. This will cause 100% risk for recurrence
- In middle ages ○ In anterior dislocation → fractures at greater tuberosity,
  ○ In posterior dislocation → fracture at greater or lesser tuberosity
- In older ages : rotator cuff tear
- Neurovascular injury : (axillary artery , nerve)
- Most common nerve to be injured is axillary nerve
- Late complications : ○ 1- Avascular necrosis of humeral head ○ 2- Heterotopic calcification ○ 3- Recurrence

Axillary nerve injury :

The axillary nerve may be injured in anterior-inferior dislocations of the shoulder joint, which cause compression of the axilla with a crutch or fracture of the surgical neck of the humerus.

Injury to the nerve results in:

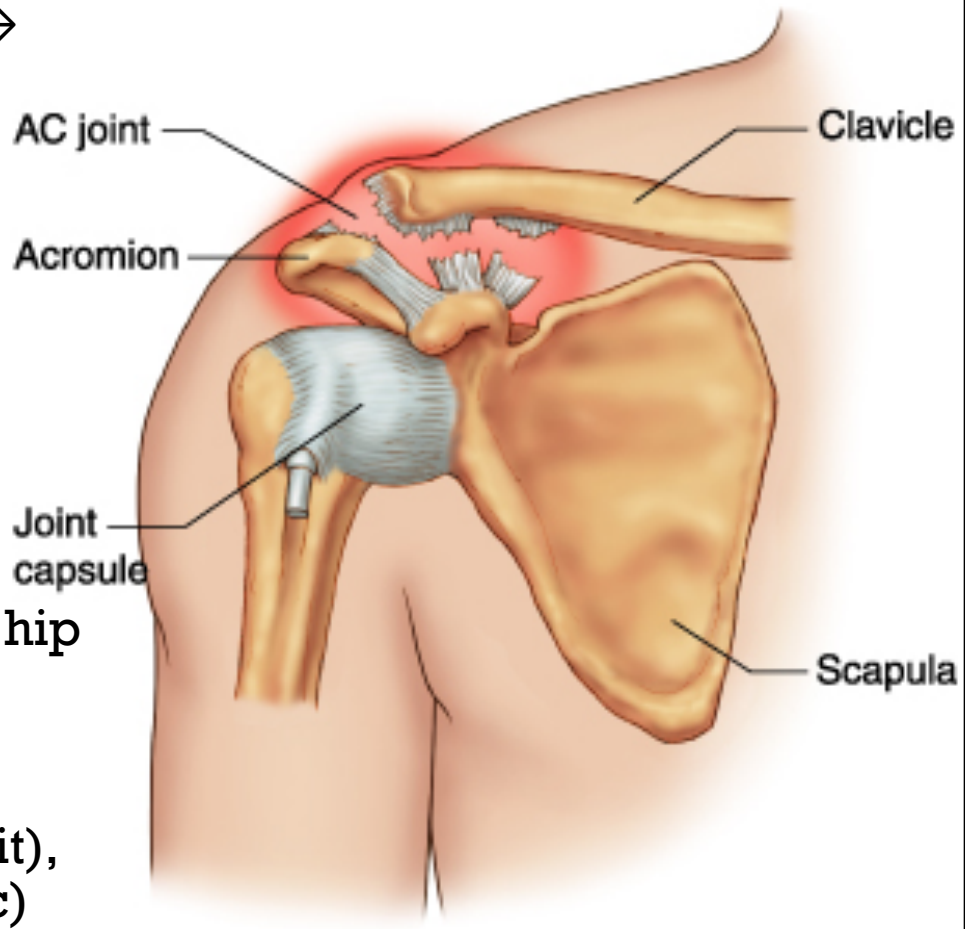
1. Paralysis of the teres minor muscle and deltoid muscle, resulting in loss of abduction of arm (from 15-90 degrees), weak flexion, extension, and rotation of shoulder. Paralysis of deltoid and teres minor muscles results in flat shoulder deformity.
2. Loss of sensation in the skin over a small part of the lateral upper arm (an area known as the regimental badge/patch). 124

*another complication is Hil sach lesion :

can happen at any age, it is an compression fracture by the glenoid on the humeral head, because the glenoid is way stronger than the humeral head, so during anterior dislocations there is posterolateral compression fracture, while after a posterior dislocation the compression fracture will be anteromedially

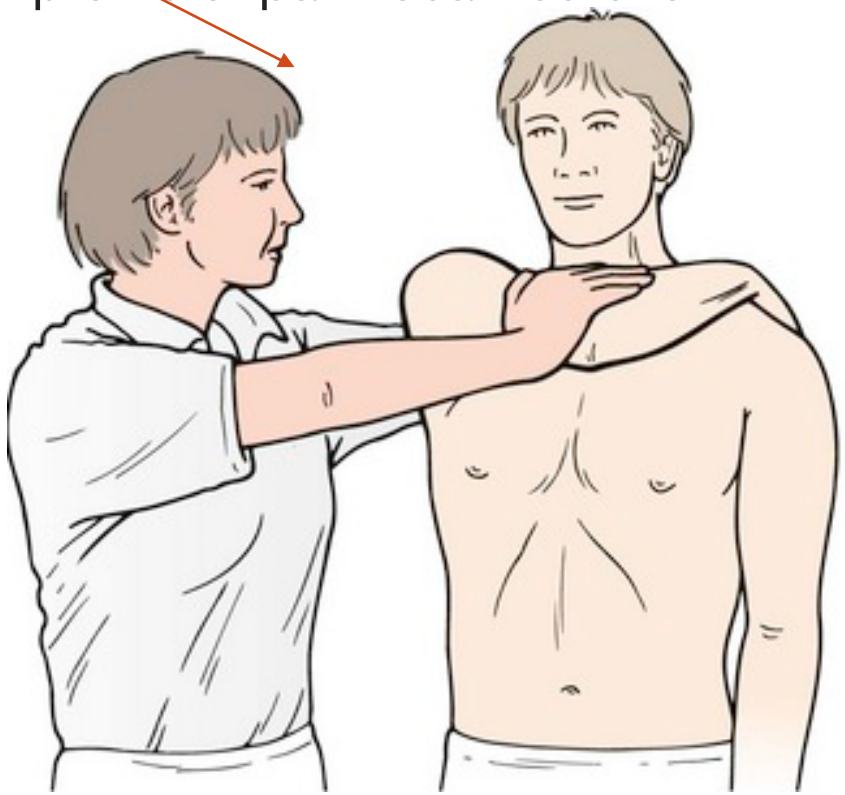
ACROMICOCLAVICULAR (AC) JOINT OSTEOARTHRITIS

- ● Most common asymptomatic joint affected by osteoarthritis → shoulder "AC joint"
- ● AC joint is the most common joint affected in shoulder
- ● Most common symptomatic joint affected by osteoarthritis → knee (in Arabic world)
- ● Most common symptomatic joint affected by osteoarthritis → hip (in western countries)
- ● It is due to normal aging process (by age, 100% you will get it), but 95% of people are asymptomatic, only 5% are symptomatic)
- ● Osteoarthritis MC site ○ Knee → medial ○ Hip → superior ○ Shoulder → posterior



- **On physical examination :**

there's is Localized tenderness over the AC joint, positive Scarf Test, (considered positive if the maneuver successfully reproduces the patient's symptoms of pain localized over the AC joint)



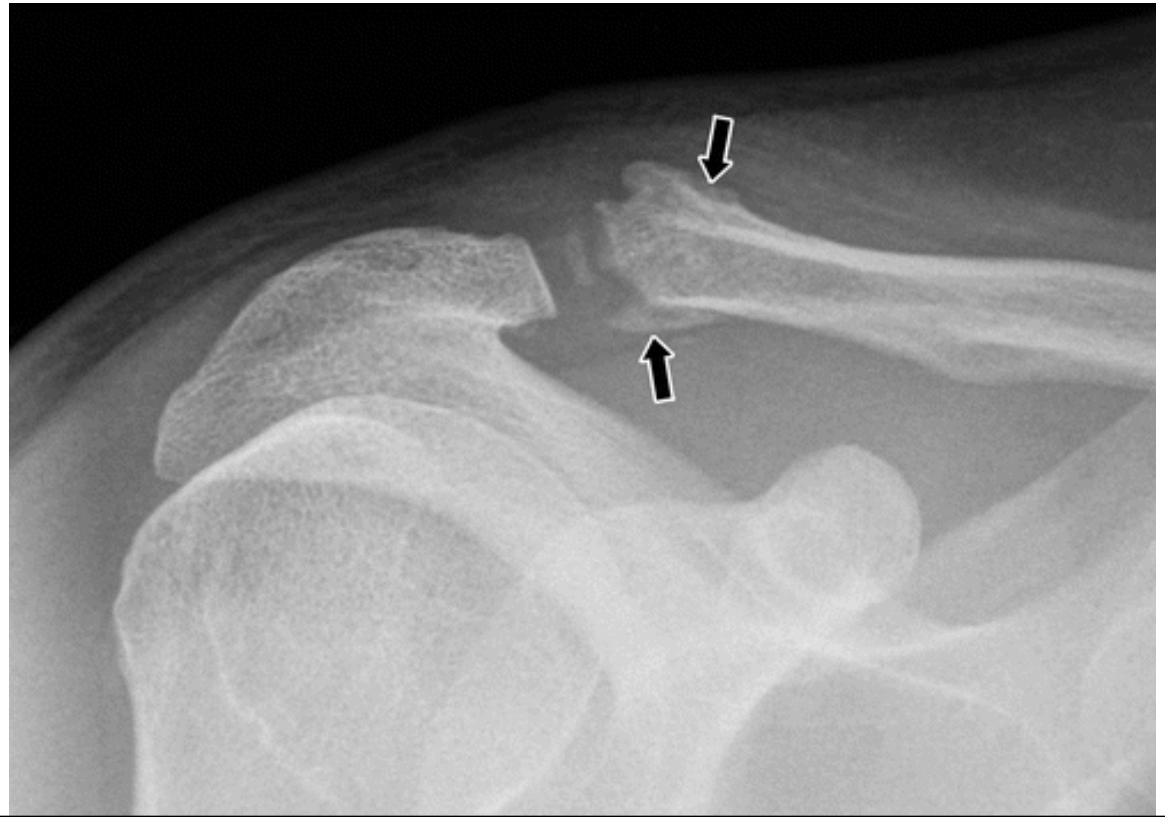
- **Moving the shoulder might also produce a clicking or creaking noise (crepitations)**

- **All shoulder diseases are treated first conservatively , if failed → surgery**

- X-ray findings of osteoarthritis :

1- narrowing of joint space (at the end this space will be lost and obliterated)
2- osteophyte formation
3- cyst formation
4- subchondral sclerosis

· X-ray findings are not related to the severity of symptoms



Management:

conservative : NSAIDs (eg: naproxen) , ice on the joint, physiotherapy, intra articular injection

if conservative treatment failed then we do surgery

GLENOHUMERAL OSTEOARTHRITIS

- Degenerative progressive joint disease

- Epidimioilogy :
  - Rare in our countries
  - occurs in young age athletes but more common in the elderly

- Risk factors :
  - Age (usually over 50 yrs)
  - Positive family hx (Hereditary)
  - Posttraumatic (fracture or dislocation): occurring at younger ages
  - Rheumatoid arthritis

Clinical presentation :

- Symptoms:

  - Pain
- Limited range of motion
  - Crepitations.

Physical exam :

- Tenderness at GH joint
- Flattening of the anterior shoulder contour
- Functional limitations at GH joint
- Painful shoulder
- Muscle atrophy or weakness

Investigations :

Shoulder X-ray :

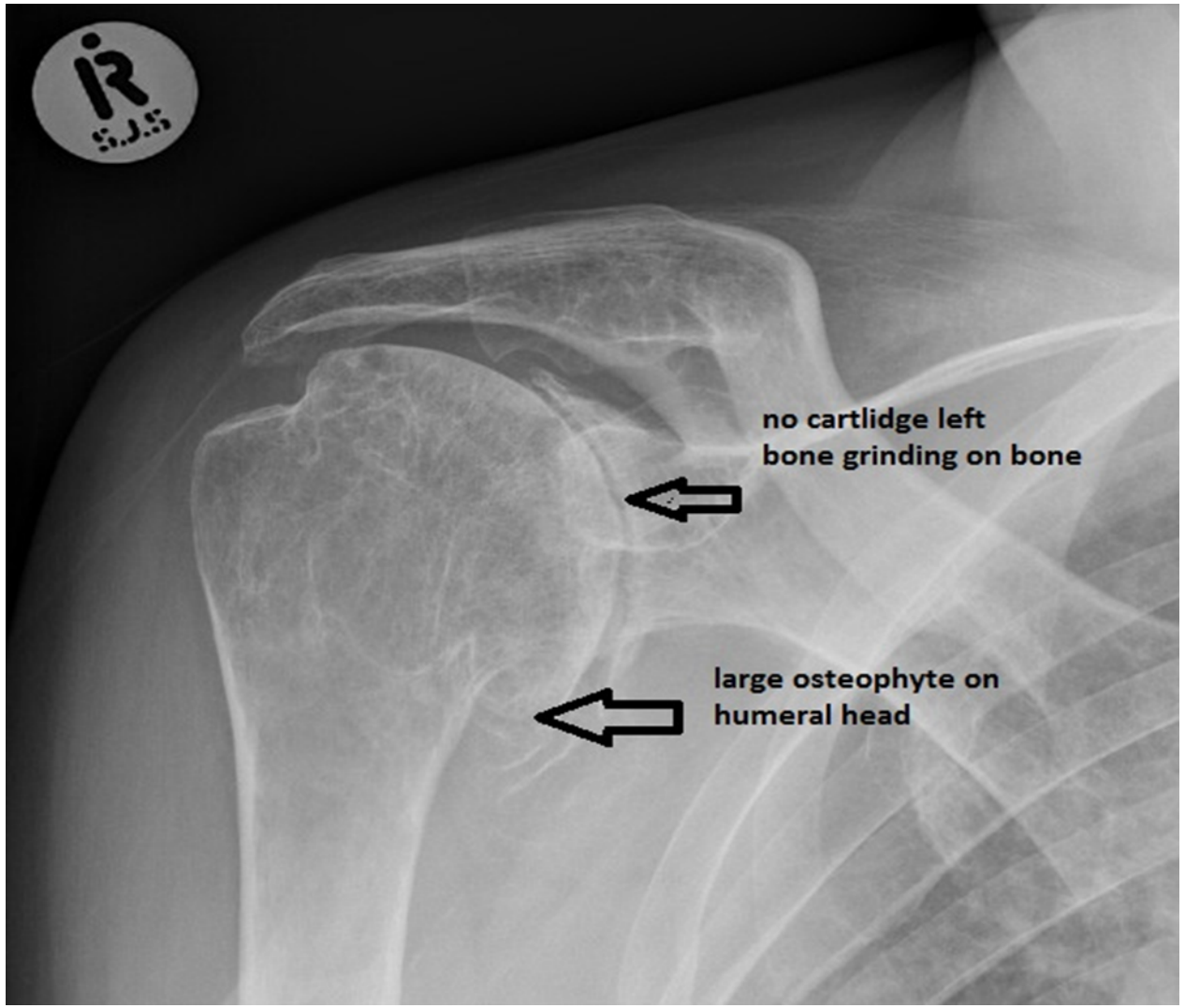
We can see typical osteoarthrosis changes like :

1) Narrowed joint space

2) Subchondral sclerosis

3) Osteophytes

4) Subchondral cysts



Management :

Nonoperative:

- Activity modification
- Physiotherapy
- Medications

Operative:

Indications :

1- unresponsive to nonoperative treatment

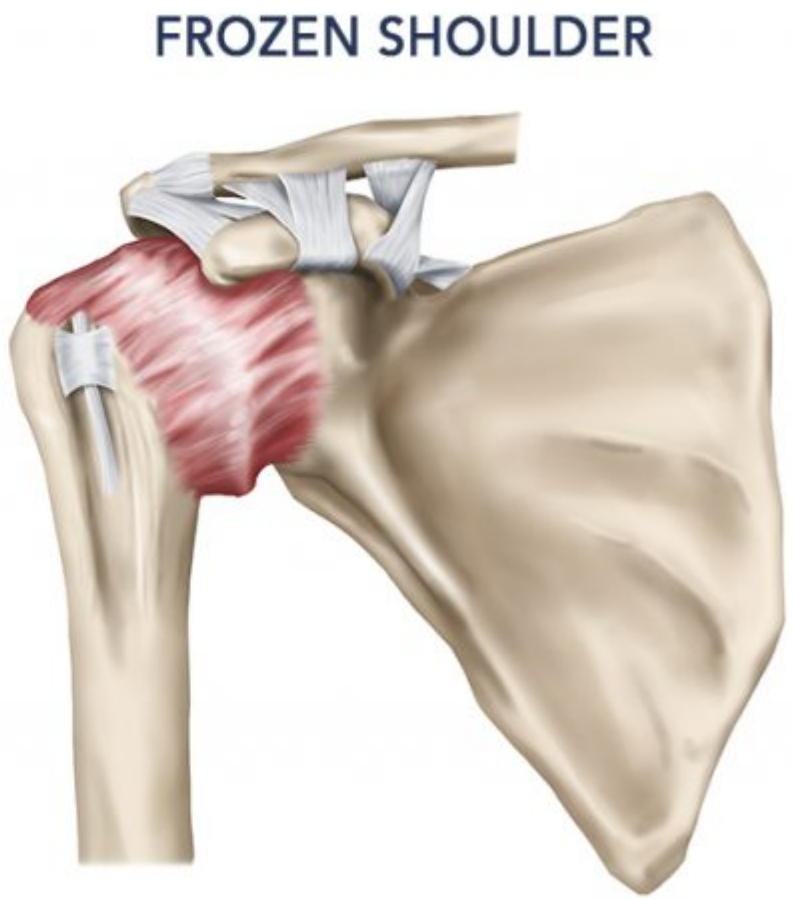
2-progressive pain

3- decreased ROM

4- inability to perform activities of daily living

FROZEN SHOULDER/ADHESIVE CAPSULITIS

- its a painful and disabling disorder of unclear cause in which the shoulder capsule, the connective tissue surrounding the glenohumeral joint of the shoulder, becomes inflamed and stiff, greatly restricting motion and causing chronic pain.
- It is an idiopathic pathology
- capsulitis is a misnomer because Thickening in the capsule isn't an inflammatory process { no inflammatory cells}
- Pain is usually constant, worse at night, and with cold weather.
- It affects more women than men. The recovery is very slow
- if its secondary to a trauma ,injury or any cause the name will change to secondary shoulder stiffness



- Starts in rotator interval : between supraspinatus to subscapularis

- First movement to be lost is external rotation while in secondary shoulder stiffness the first to be lost is Abduction

- To prevent the problem, a common recommendation is to keep the shoulder joint fully
moving to prevent a frozen shoulder.

- **Stages of Frozen Shoulder:**

1)from 0-6 months: “freezing” or painful stage :

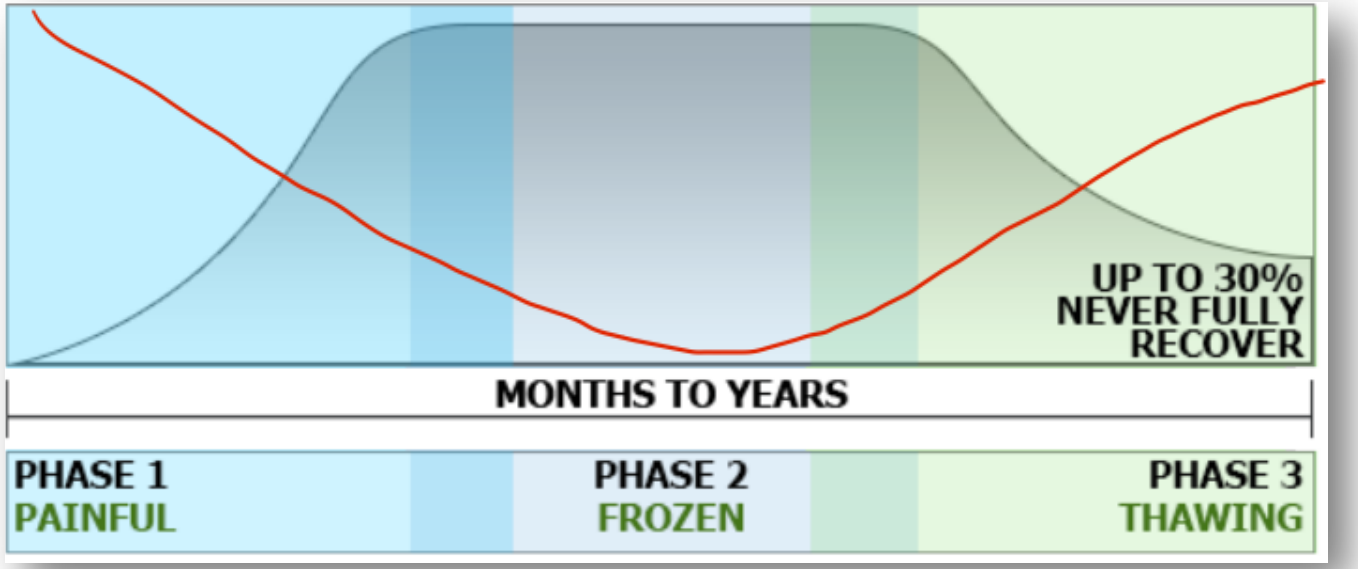
pain increases gradually, range of motion decreases gradually

2) from 6-12 months: “frozen” or adhesive stage :

the pain is the maximum, range of motion is the minimum

3)from 1- 1.5 year : "thawing" or recovery stage

pain decreases until it disappears, range of motion increases until it becomes near normal.



Clinical presentation

Symptoms:

~Severe aching pain in shoulder/upper arm.
~Restricted shoulder movement.
~Difficulty in routine activities.

Signs:

~Restricted flexion, extension, abduction and circumduction.
~Uniform impairment of all shoulder movements.

Management :

Conservative :

Ø Rest to joint during acute stage.
Ø Provide sling.
Ø Mild passive shoulder exercises
Ø To prevent the problem, a common recommendation is to keep the
shoulder joint fully moving to prevent a frozen shoulder.
Ø Physical therapy and occupational therapy can help with continued
movement.

➡ The condition tends to be self-limiting and usually resolves over time without surgery. Most people regain about 90% of shoulder motion over time.

IMPINGEMENT SYNDROME

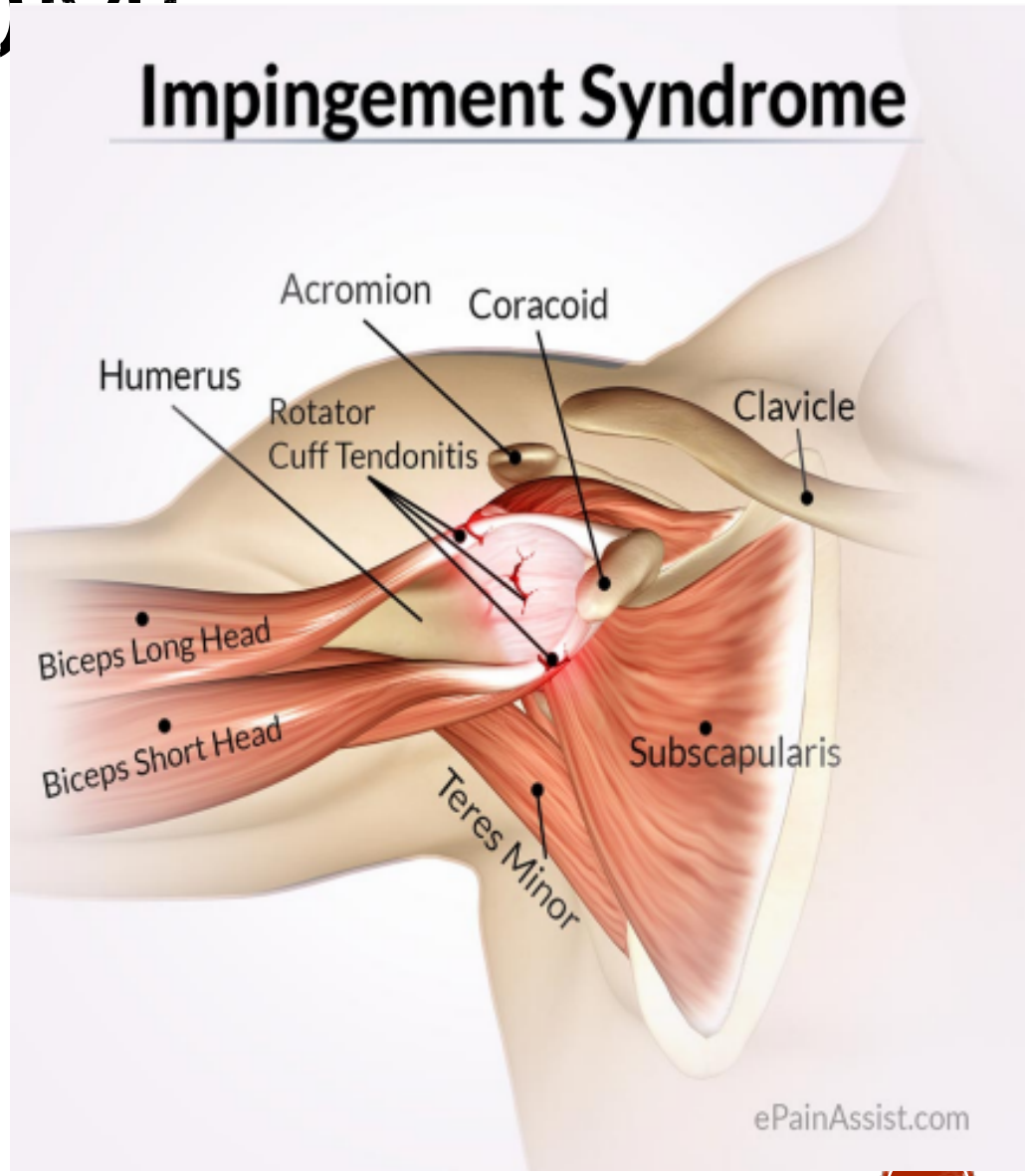
- Compression of the rotator cuff against the anterior structure of coracoacromial arch, anterior 1/3 of the acromion, coraco-acromial ligament & AC joint.
- Supraspinatus is thickened in this disease
- Tendonitis > inflammation> edema> thickening > impingement (and the cycle is repeated again)
- Causes of impingement syndrome:

1-AC joint arthritis

2-bursitis

3-fractured acromion

4- certain types of acromion are at more risk



Stages of Impingement Syndrome :

- Stage 1: Edema and hemorrhage (patients usually <25 years)
- Stage 2: Fibrosis and tendinitis (patients 25-40 years)
- Stage 3: RC tear, biceps tendon rupture, bony change (patients generally, >40 years)

Clinical Presentation:

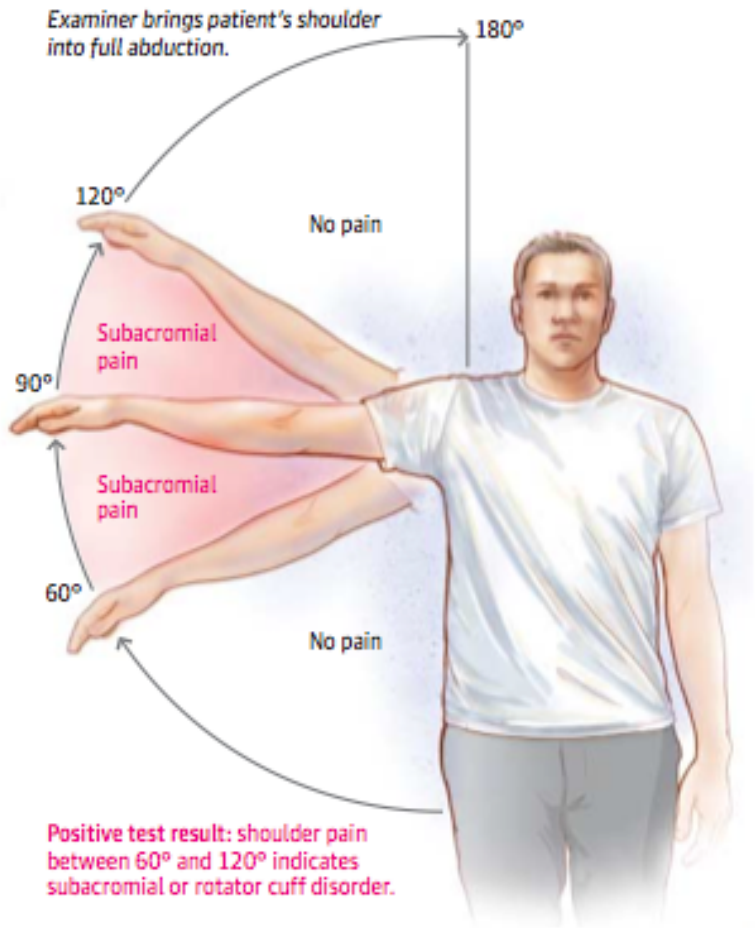
Symptoms:

- shoulder pain: (insidious onset , exacerbated by overhead activities and lifting objects away from body , night pain)
- Weakness with active abduction in midrange
- Limited internal rotation compared to normal side

Physical examination :

Positive impingement tests
Positive or negative rotator cuff tear tests

Impingement tests:



Neer's test

Hawkins-Kennedy Test

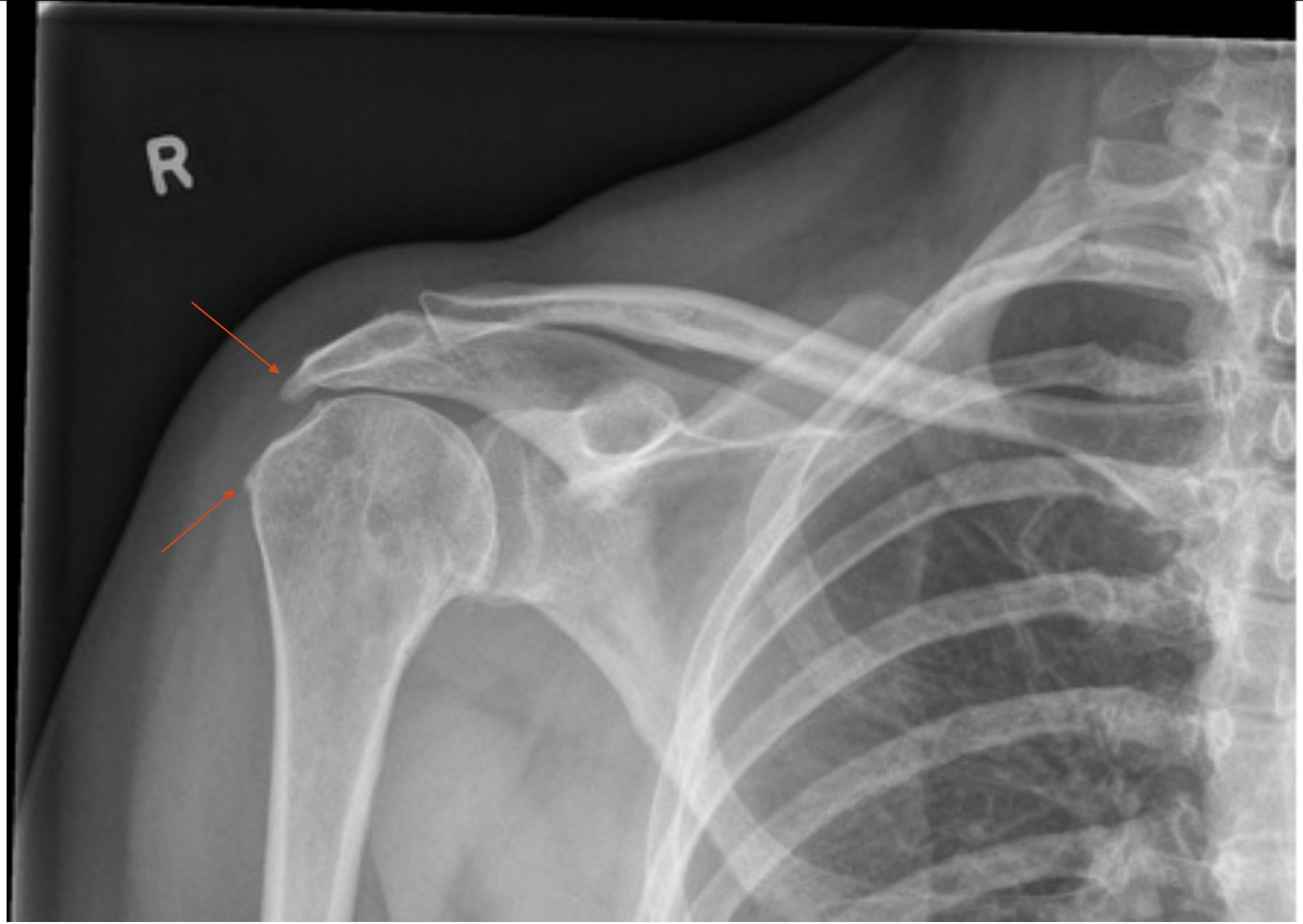
Investigations:

- **Plain x ray**
- Findings :
  - Traction osteophytes
  - Calcification of the coracoacromial ligament
  - Cystic changes within the greater tuberosity
  - Hooked acromion
- **MRI :**

Evaluating the degree of rotator cuff Pathology

- **CT /US :**

Accurately image the rotator cuff tendons and muscle bellies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Management :

First line Management is
non operative , by :

1. Activity Modification
2. NSAIDS For 2-3 Weeks (best choice is Naproxin)
3. Physiotherapy
4. Stretching, strengthening
5. Manual therapy-6 weeks

ROTATOR CUFF TEAR

• important functions of the Rotator cuff muscle:

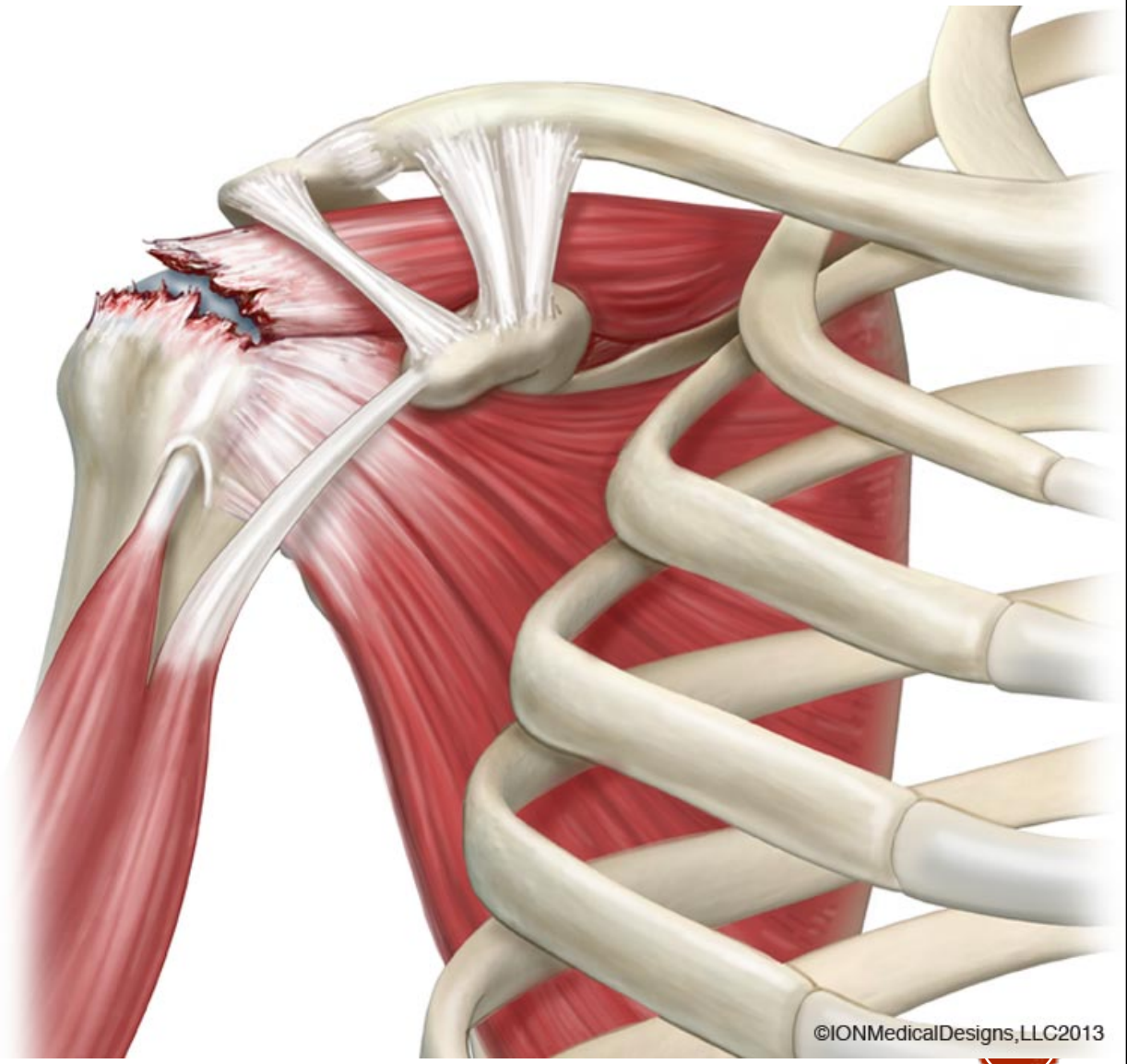
~ Counterbalance the upward pull of the deltoid on the humerus.

~ Hold the head of the humerus secure in the glenoid.

~Externally rotate the shoulder which is important during arm elevation

• The pain increases at night due to increase in prostaglandin level

• DDx:
1- MI (DON'T mess MI, can present with ONLY shoulder pain)
2- cervical spine disease
3- any shoulder disease



Mechanisms of tear is either acute or chronic

1- Acute :acute avulsion injuries
• acute subscapularis tears seen in younger patients following a fall
• acute SIT tears seen in patients > 40 yrs with a shoulder dislocation

2- Chronic : (more common)
• chronic degenerative tear (intrinsic degeneration is the primary etiology)
• Chronic impingement

Types of rotator cuff tear:

1-partial thickness tear → least to affect movement

2-full thickness tear → pain isn't related to degree of tear

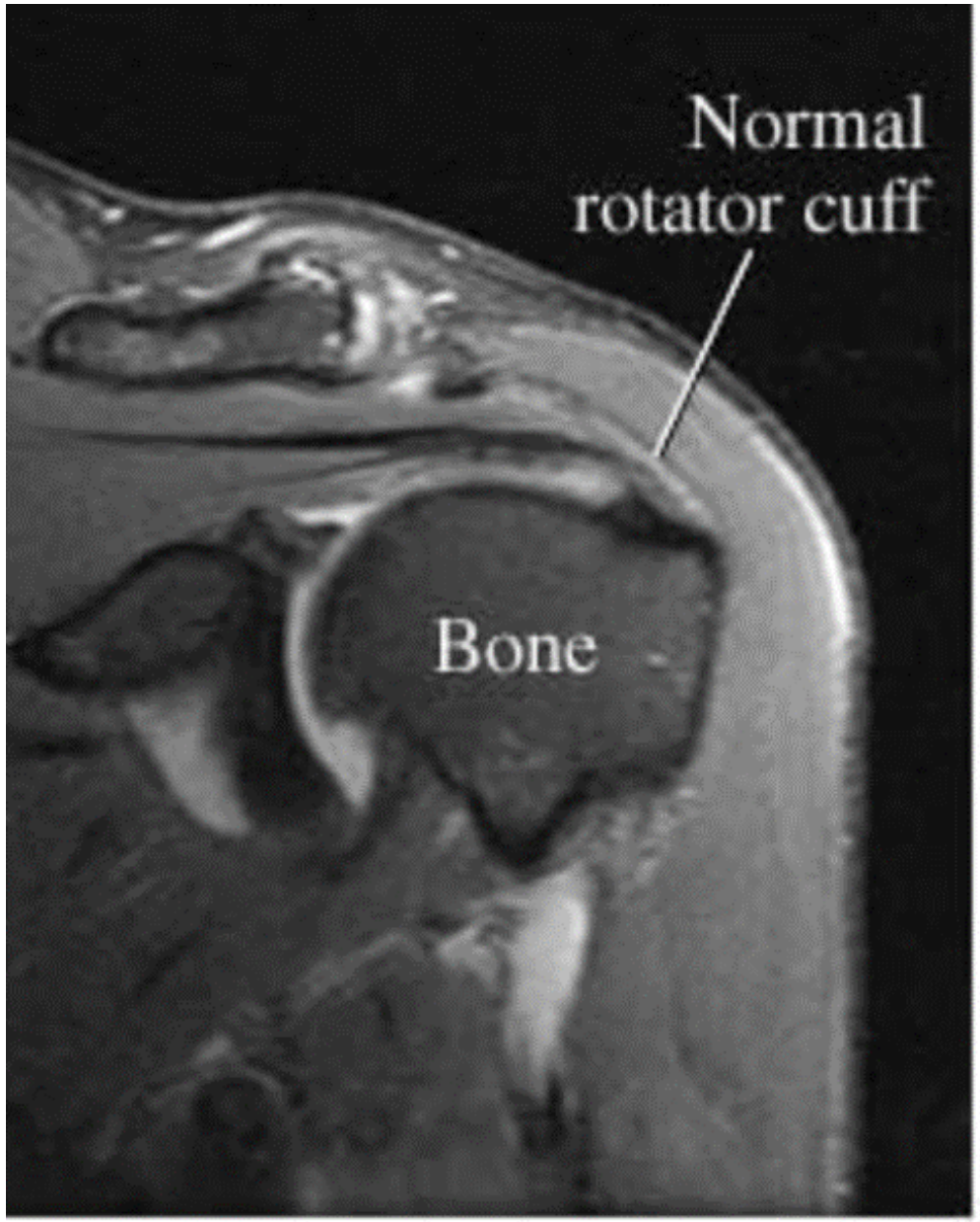
3-complete full thickness tear (full rupture) → severe pain

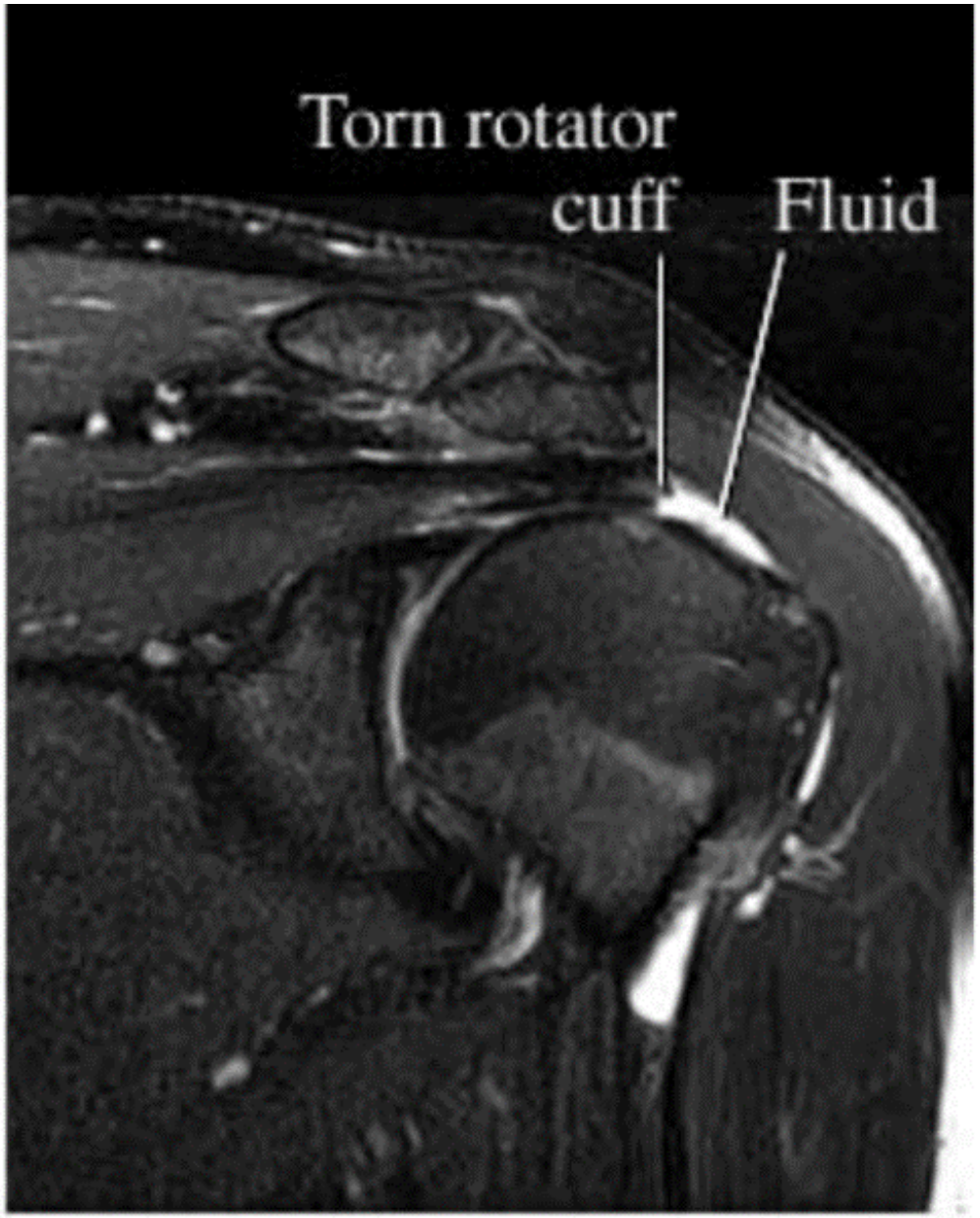
Clinical presentation

Symptoms :

- Pain around shoulder
- non resolving or responding to NSAIDS
- Sleep disturbed by pain
- Weakness during activities of daily living

Investigations : MRI


Normal
rotator cuff
Bone


Torn rotator
cuff
Fluid

Treatment :

Nonoperative

First line of treatment for most tears

1. Physical therapy

2. NSAIDS

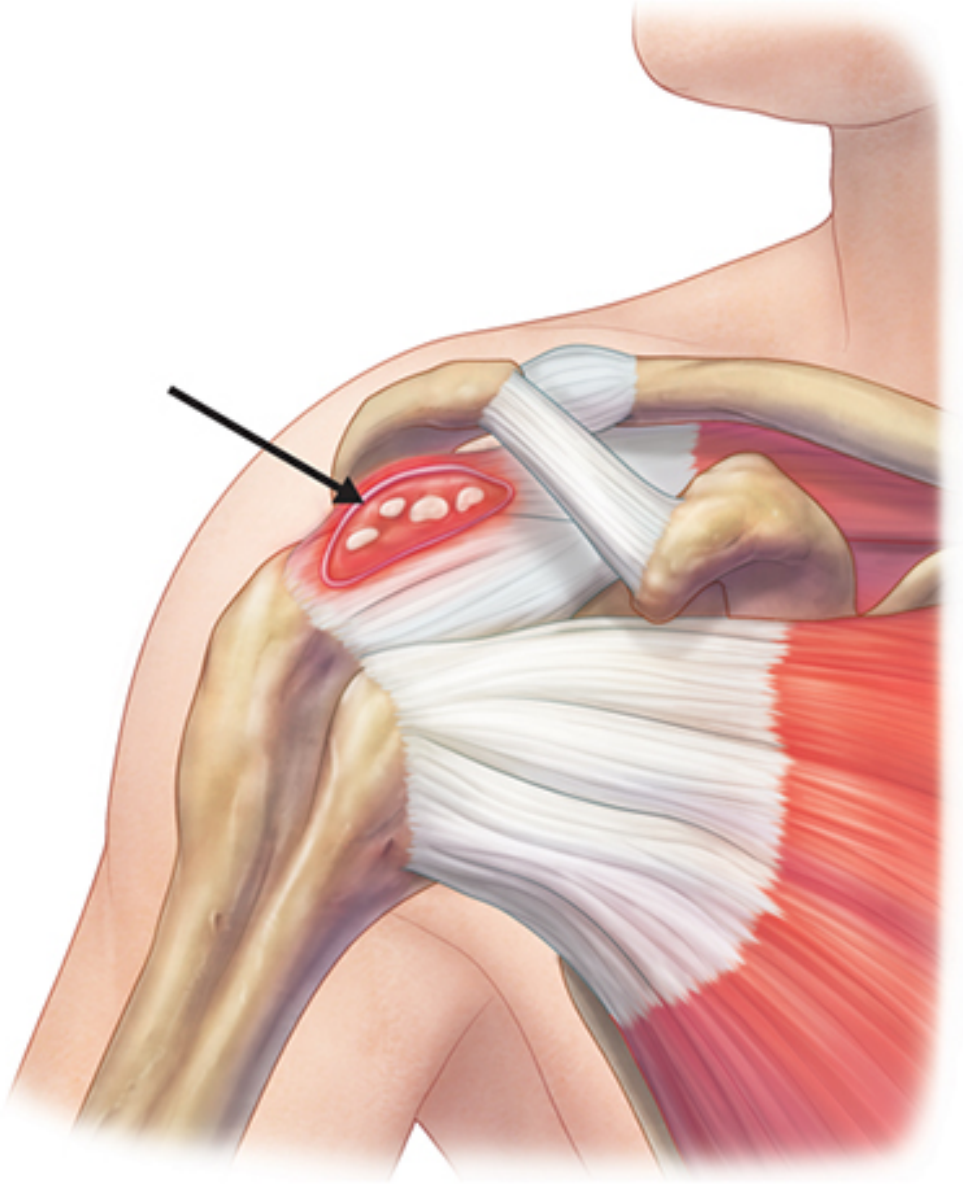
3. Corticosteroid injections:
if impingement thought to be major cause of symptoms.

Operative

1. Subacromial decompression and rotator cuff debridement alone
2. Rotator cuff repair (arthroscopic or mini- open)
3. Tendon release, debridement of degenerative tissue and repair
4. Tendon transfer
5. Reverse total shoulder arthroplasty

CALCIFIC TENDONITIS:

- Calcific tendinitis is a form of tendinitis, a disorder characterized by deposits of hydroxyapatite (a crystalline calcium phosphate) in any tendon of the body, but most commonly in the tendons of the rotator cuff (shoulder), causing pain and inflammation.
- The condition is related to and may cause adhesive capsulitis ("frozen shoulder")
- 2% in the 5 th decade, but zero% in the 6 th decade, this means it is self-limiting
- Usually idiopathic, but can be associated with DM, IHD, and epilepsy ·
- Most common muscle to be affected is supraspinatus



Classified into:

1-acute : acute pain with normal x-ray (you may think it is septic joint!)

2-subacute: decreased pain, normal x-ray

3-chronic: more than 3 months, calcification appears on x-ray

Investigations : Xray

Treatment :

Conservative only , no surgery is required :
Analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) are useful to a limited extent.

Corticosteroid injections may be useful when the shoulder is acutely inflamed but otherwise are not generally useful except for the temporary relief of pain.

***NOTE**: in all shoulder disorders, supraspinatus is the the most affected one → ex; Calcific tendonitis and rotator cuff tear.


Thank you