

# Glenohumeral Dislocation



- The bony anatomy of the shoulder joint does not provide inherent stability.
- Only one fourth of the large humeral head articulates with the glenoid at any given time.

- the glenoid is deepened by 50% by the presence of the glenoid labrum . The labrum increases the humeral contact to 75%.
- The *labrum*:- is a special cartilaginous structure inside the shoulder. It is attached almost completely around the edge of the glenoid.

## End View of Scapula

Acromion

Clavicle

Coracoid  
process

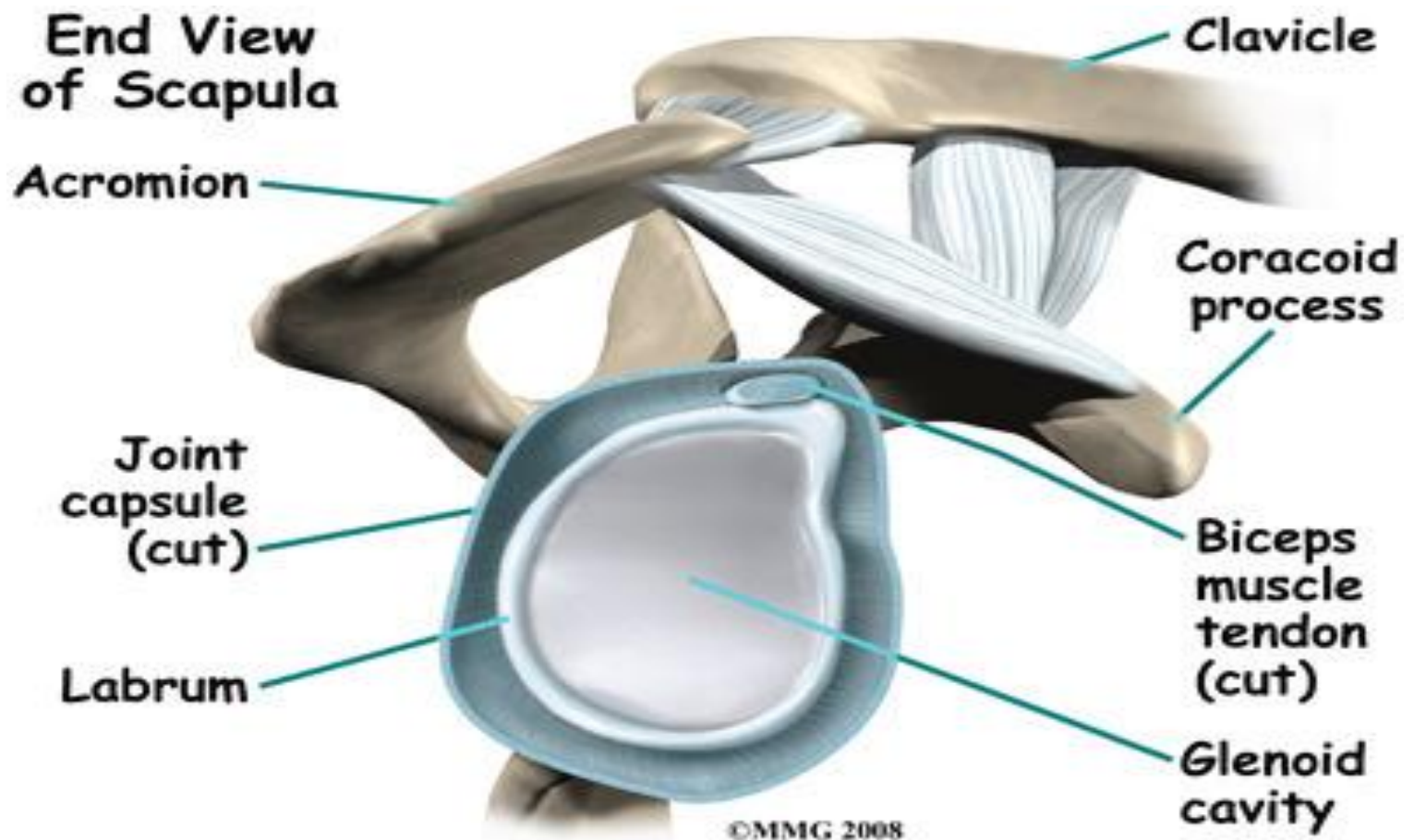
Joint  
capsule  
(cut)

Labrum

Biceps  
muscle  
tendon  
(cut)

Glenoid  
cavity

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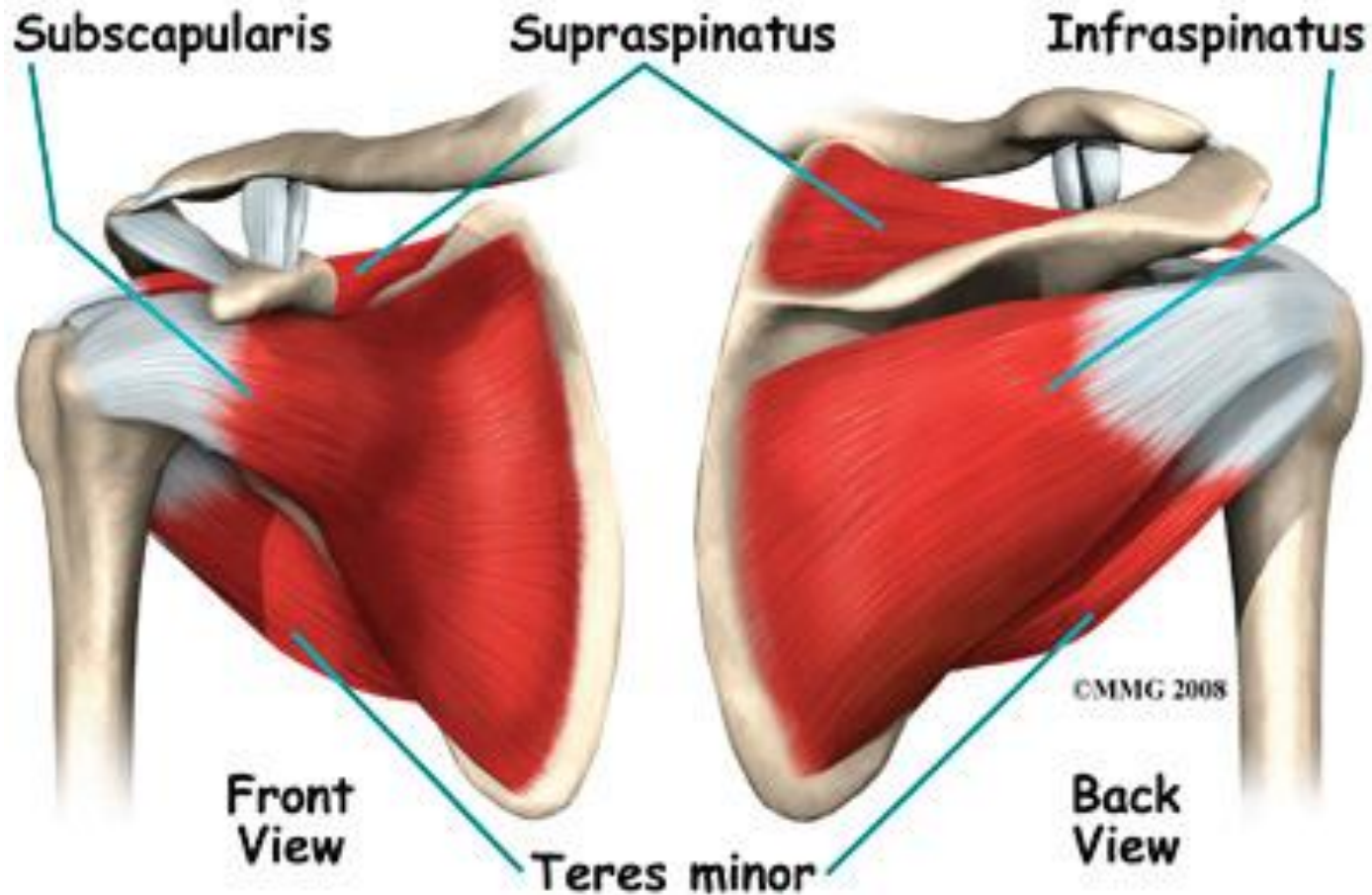


- Integral to the glenoid labrum is the insertion of the tendon of the long head of the biceps, which inserts on the superior aspect of the joint and blends to become indistinguishable from the posterior glenoid labrum .
- The shoulder joint capsule is lax and thin and, by itself, offers little resistance or stability. Anteriorly, the capsule is reinforced by three capsular thickenings or ligaments that are intimately fused with the labral attachment to the glenoid rim.

The intrinsic muscle forces from the rotator •  
cuff provide compressive or stabilizing  
forces.

# The Rotator Cuff

## Muscles of the Rotator Cuff



# SHOULDER JOINT STABILITY

- The glenohumeral joint is a highly mobile ball and socket joint
- The ***stability*** of the joint depends upon four factors:
- ***1- suction cup effect of the labrum*** (cartilage rim which increases depth of cup)  
***2 – negative intra-articular pressure and limited joint volume***  
***3 – static stabilizers*** (labrum and ligaments)  
***4 – dynamic stabilizers*** (muscle groups, especially the rotator cuff, biceps and subscapularis muscles)



# EPIDEMIOLOGY

- The shoulder is the most commonly dislocated major joint of the body, accounting for up to 45% of dislocations.
- Most shoulder dislocations are anterior; this occurs between eight and nine times more frequently than posterior dislocation, the second most common direction of dislocation.
- Inferior and superior shoulder dislocations are rare

# ANTERIOR GLENOHUMERAL DISLOCATION

## Anterior Dislocation



# Mechanism of Injury

.Indirect trauma to the upper extremity with forceful abduction, extension, and external rotation of the shoulder is the most common mechanism

.Direct, anteriorly directed impact to the posterior shoulder may produce an anterior dislocation

# Clinical Evaluation

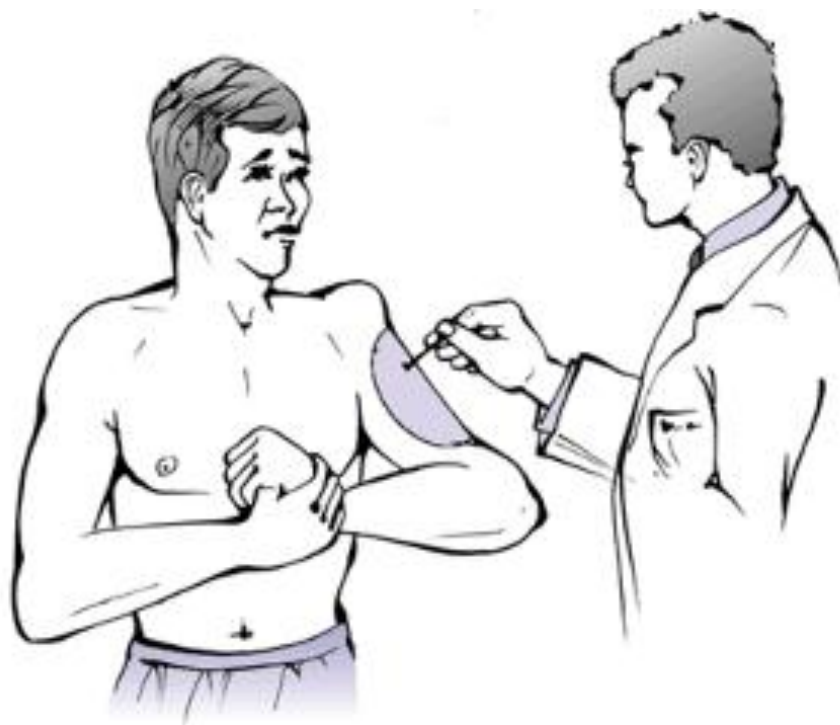
.The patient typically presents with the injured shoulder held in slight abduction and external rotation. The acutely dislocated shoulder is painful, with muscular spasm

.Examination typically reveals squaring of the shoulder owing to a relative prominence of the acromion, a relative hollow beneath the acromion posteriorly, and a palpable mass anteriorly

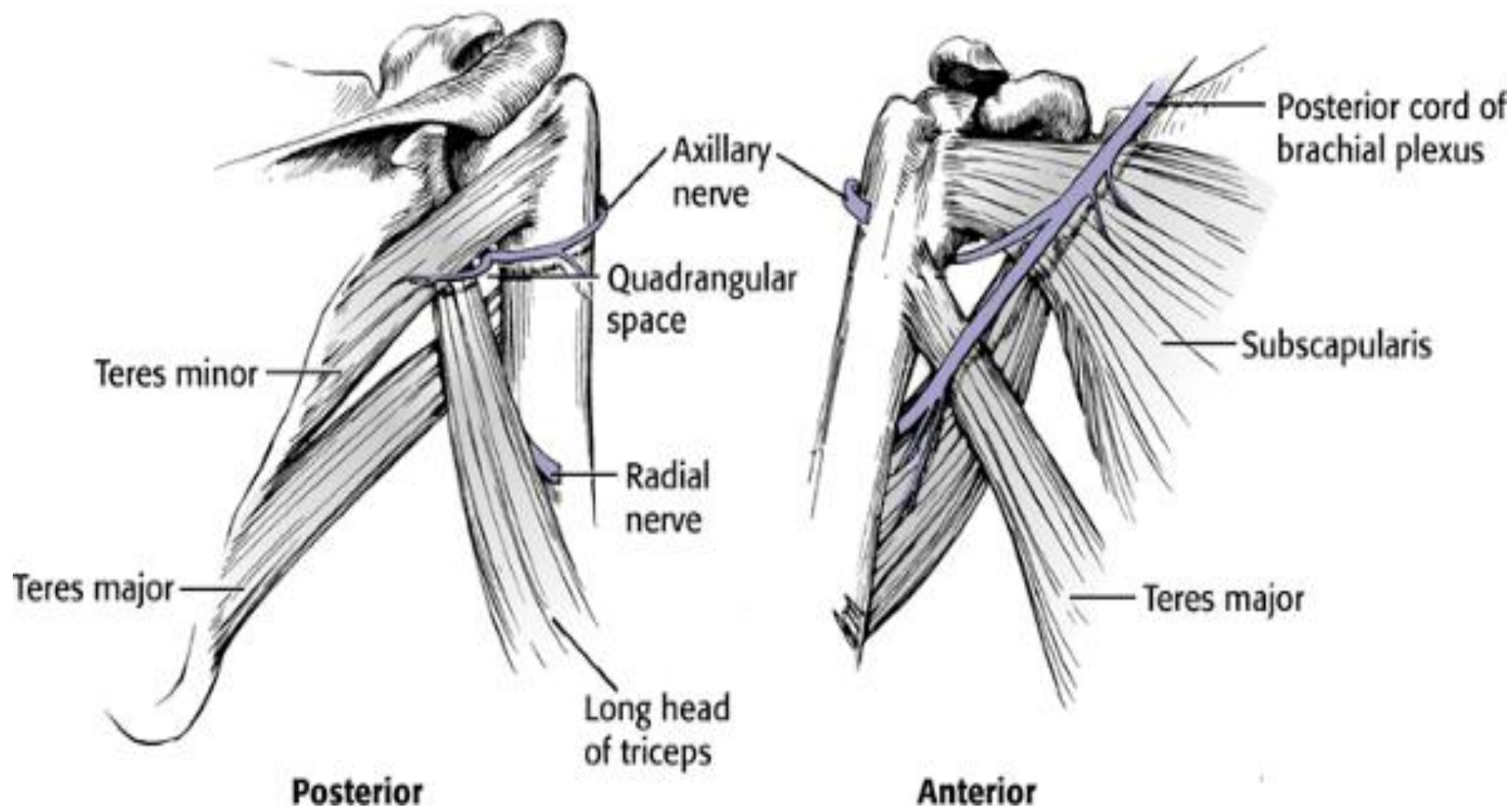
A careful neurovascular examination is • important, with attention to axillary nerve integrity. Deltoid muscle testing is usually not possible, but sensation over the deltoid may be assessed. Musculocutaneous nerve integrity can be assessed by the presence of sensation on the anterolateral forearm.

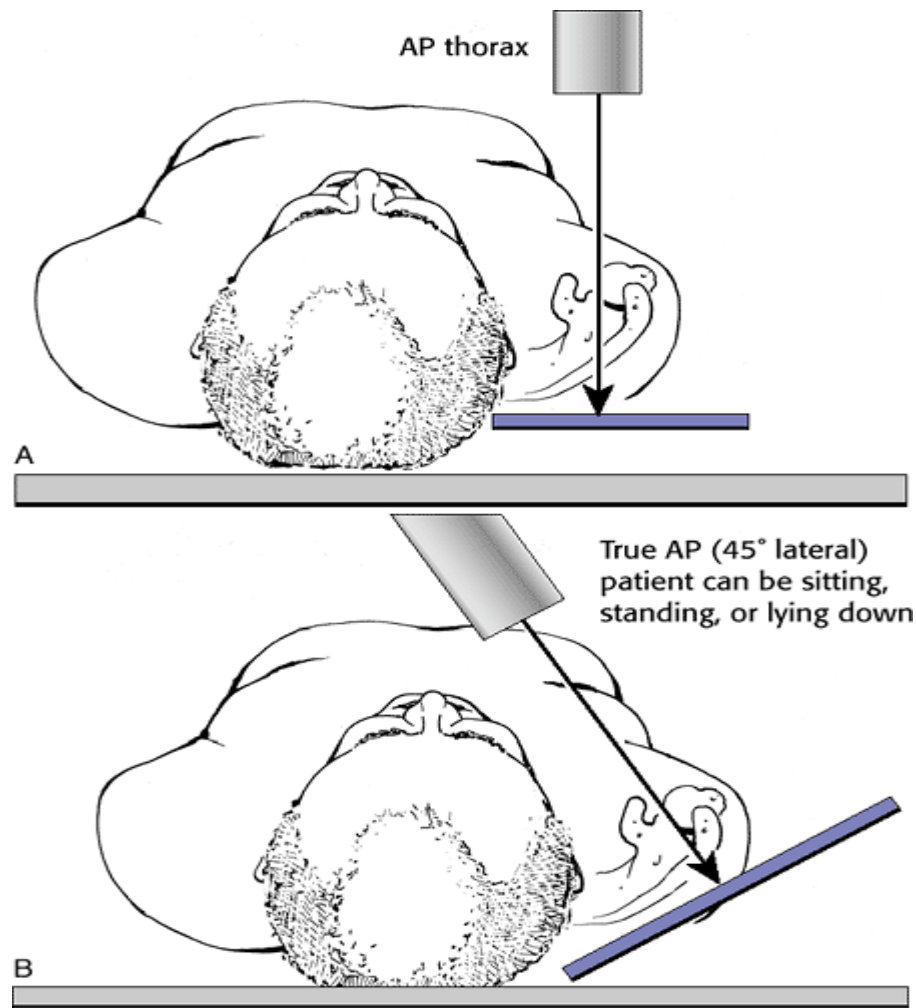


A



B







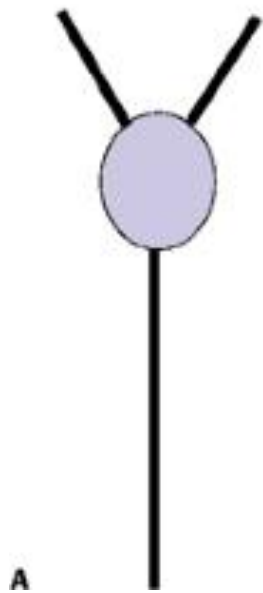
- In normal shoulders, the articular surface of the humeral head should overlap the elliptical shadow of the glenoid .
- A dislocated glenohumeral joint is suggested when this overlap is significantly altered.
- distance between the anterior glenoid rim and the humeral head that is greater than 6 mm is highly suggestive of a posterior shoulder dislocation (positive rim sign)



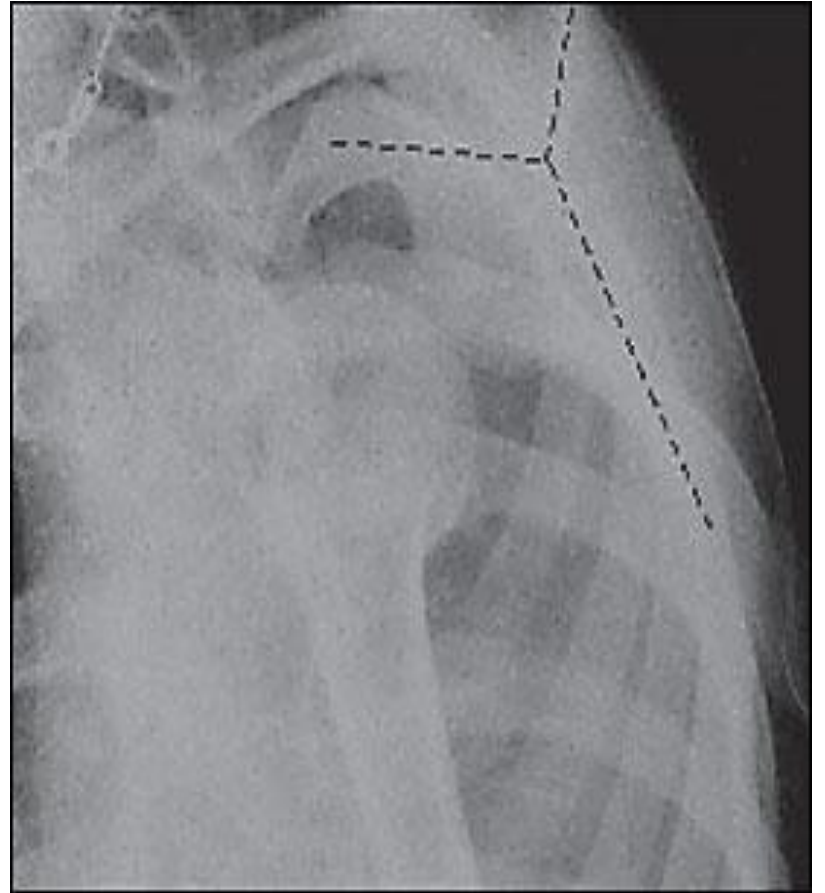
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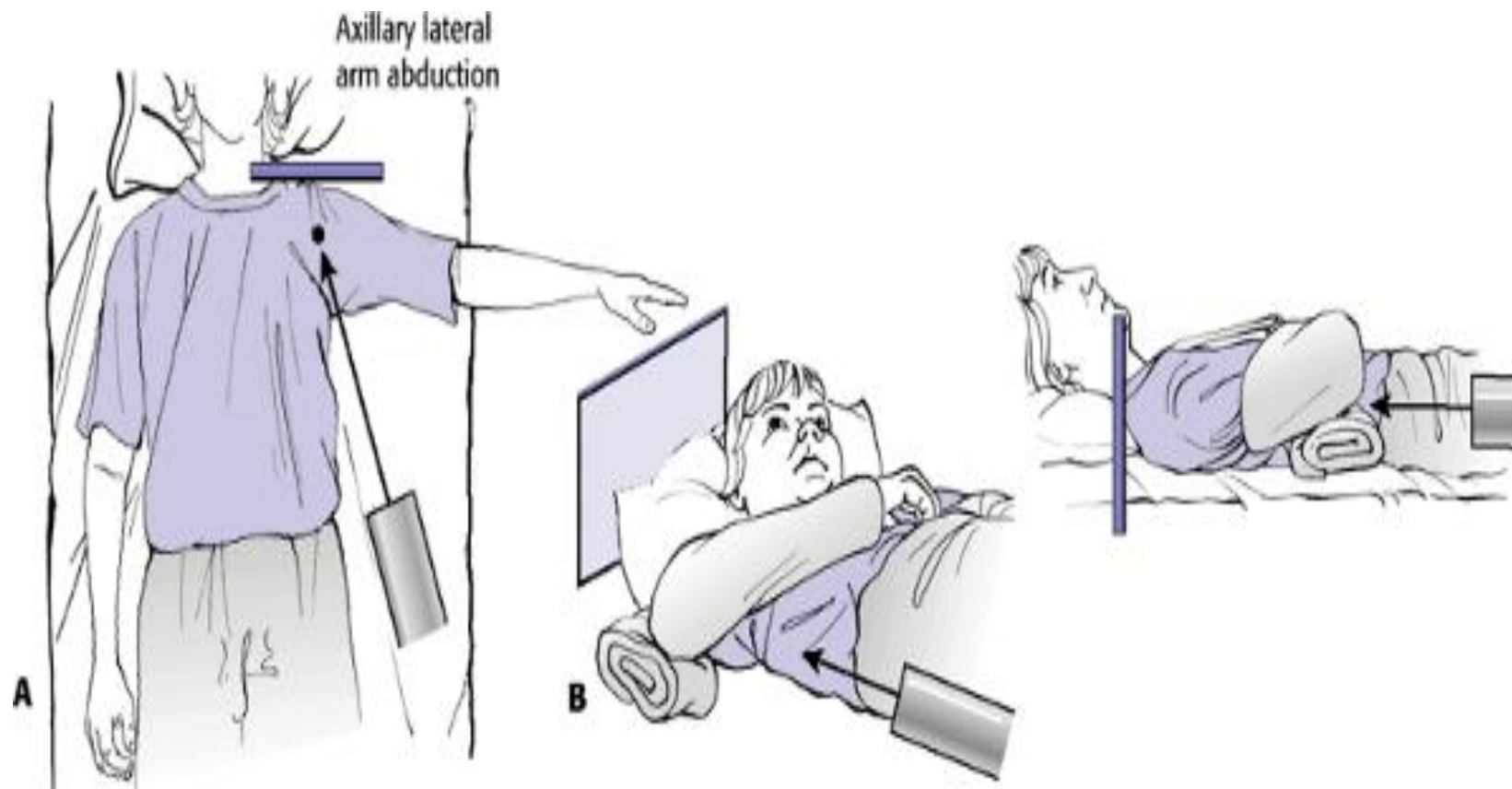


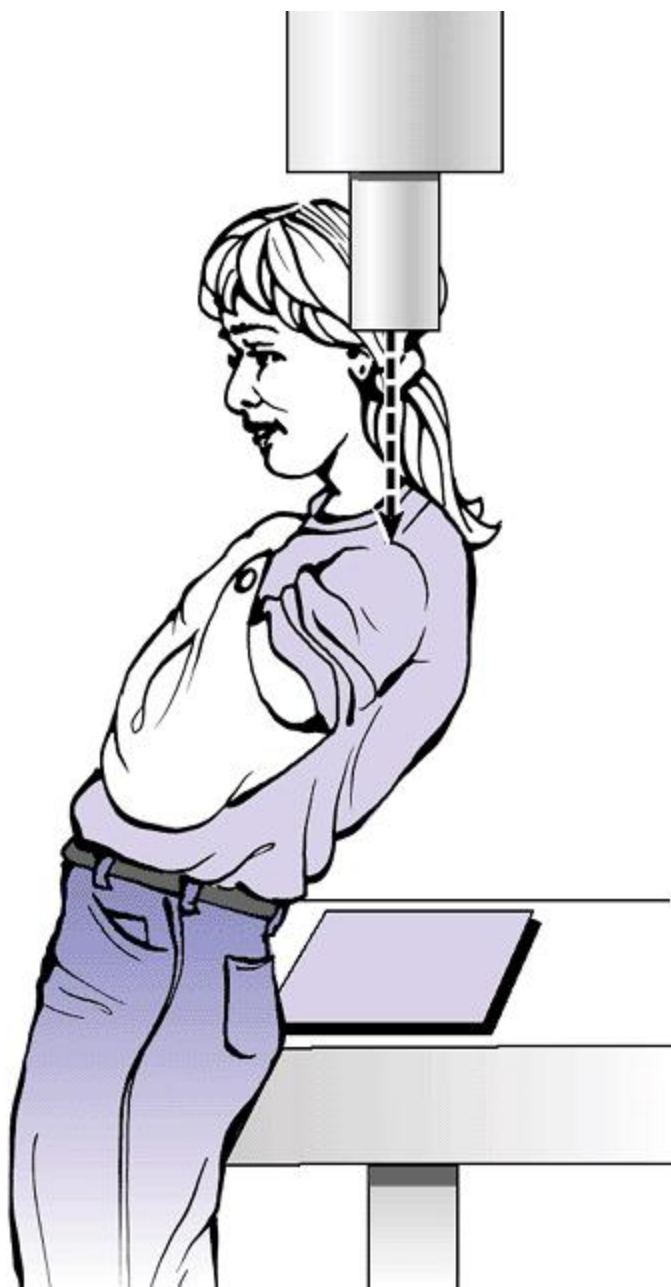
B



# X-ray







- Velpeau  
axillary  
lateral view  
x-ray

# Treatment

Closed reduction should be performed after adequate clinical evaluation and administration of analgesics and/or sedation. Described techniques include

# Hippocratic technique

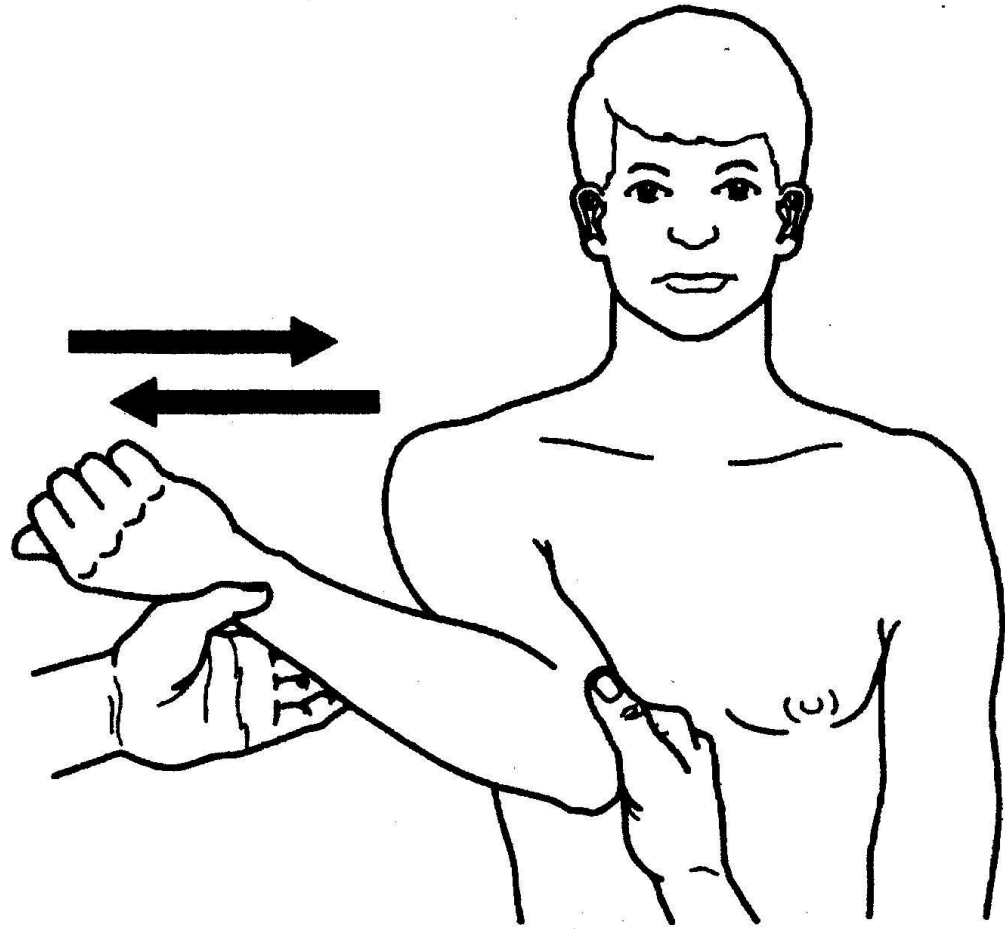


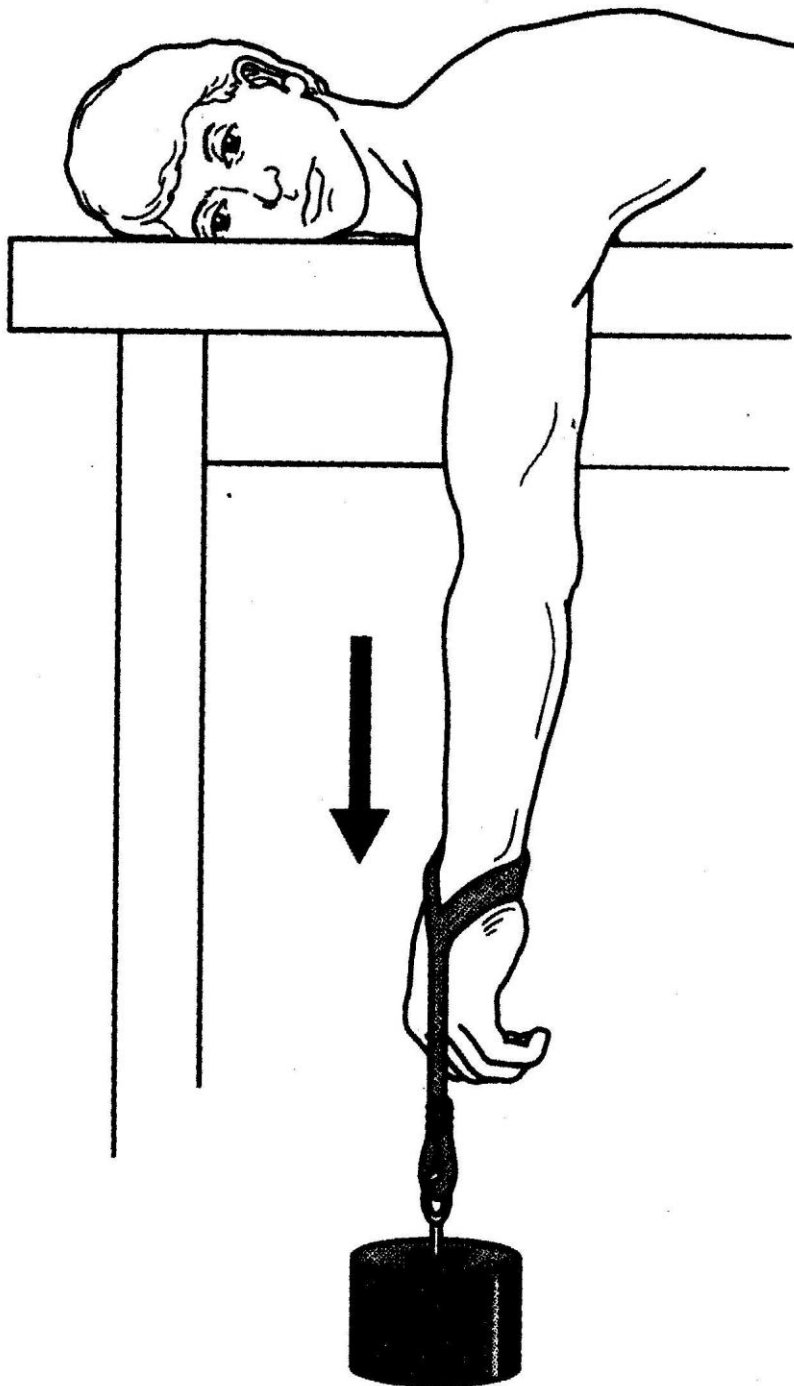
Techniques for closed shoulder reduction. The Hippocratic method (A) uses inferior traction on the arm against the countertraction provided by the foot on the thorax. Do not place the foot in the axilla, as this could cause damage to the underlying neurovascular structures. A modification of this technique uses a hand-held sheet around the thorax to provide countertraction



# Kocher maneuver

**With the patient supine and an assistant pulling against me from the axilla flex the elbow and external rotation of the arm then traction adduction and internal rotation.**



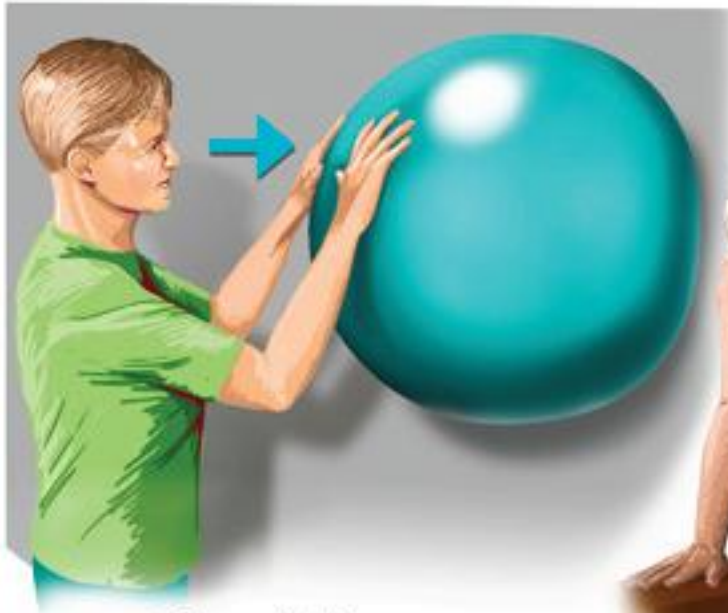


# Stimson technique

After administration of analgesics and/or sedatives, the patient is placed prone on the stretcher with the affected upper extremity hanging free. Gentle, manual traction or 5 lb of weight is applied to the wrist, with reduction effected over 15 to 20 minutes .

Postreduction care includes immobilization for 2 to 5 weeks. A shorter period of immobilization may be used for patients older than 40 years of age because stiffness of the ipsilateral hand, wrist, elbow, and shoulder tends to complicate treatment. Younger patients with a history of recurrent dislocation may require longer periods of immobilization

Aggressive occupational therapy should be instituted following immobilization, including increasing degrees of shoulder external rotation, flexion, and abduction as time progresses, accompanied by full, active range of motion to the hand, wrist, and elbow



## Shoulder Exercises



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Operative •

Indications for surgery include

Failure of closed reduction due to soft tissue or bone interposition long head of biceps or fracture fragments from the greater tuberosity or glenoid

.Fracture dislocation

.Recurrent dislocation

# Complications

Recurrent dislocation: related to ligament and capsular changes

The most common complication after dislocation is recurrent dislocation

:Incidence •

Age 20 years: 80% to 92% (lower in non-athletes)

Age 30 years: 60%

Age 40 years: 10% to 15%

- Prognosis is most affected by age at the time of initial dislocation.
- Incidence is unrelated to the type or length of immobilization.
- Patient activity has been identified as an independent factor for developing recurrent instability.



# Osseous lesions :

- Hill-Sachs lesion
- Glenoid lip fracture (bony Bankart lesion)
- Greater tuberosity fracture
- Fracture of acromion or coracoid
- Posttraumatic degenerative changes

- Nerve injuries: These involve particularly the musculocutaneous and axillary nerves, usually in elderly individuals; neurapraxia almost always recovers, but if it persists beyond 3 months it requires further evaluation with possible exploration.

Soft tissue injuries:

- Rotator cuff tear (older patients)
- Capsular or subscapularis tendon tears

# POSTERIOR GLENOHUMERAL DISLOCATION

- These injuries represent 10% of shoulder dislocations and 2% of shoulder injuries.
- They are often unrecognized by primary care and emergency physicians, with 60% to 80% missed on initial examination.

# Mechanism of Injury

- Indirect trauma: This is the most common mechanism.
  - The shoulder typically is in the position of adduction, flexion, and internal rotation.
  - Electric shock or convulsive mechanisms may produce posterior dislocations owing to the greater muscular force of the internal rotators (latissimus dorsi, pectoralis major, and subscapularis muscles) compared with the external rotators of the shoulder (infraspinatus and teres minor muscles.)
- Direct trauma: This results from force application to the anterior shoulder, resulting in posterior translation of the humeral head.

# Clinical Evaluation

- Clinically, a posterior glenohumeral dislocation does not present with striking deformity; the injured upper extremity is typically held in the traditional sling position of shoulder internal rotation and adduction.
- A careful neurovascular examination is important to rule out axillary nerve injury, although it is much less common than with anterior glenohumeral dislocation

# Radiographic Evaluation

- Trauma series of the affected shoulder: AP, scapular-Y, and axillary views. A Velpeau axillary view may be obtained if the patient is unable to position the shoulder for a standard axillary view .
- Glenohumeral dislocations are most readily recognized on the axillary view; this view may also demonstrate the reverse Hill-Sachs defect.

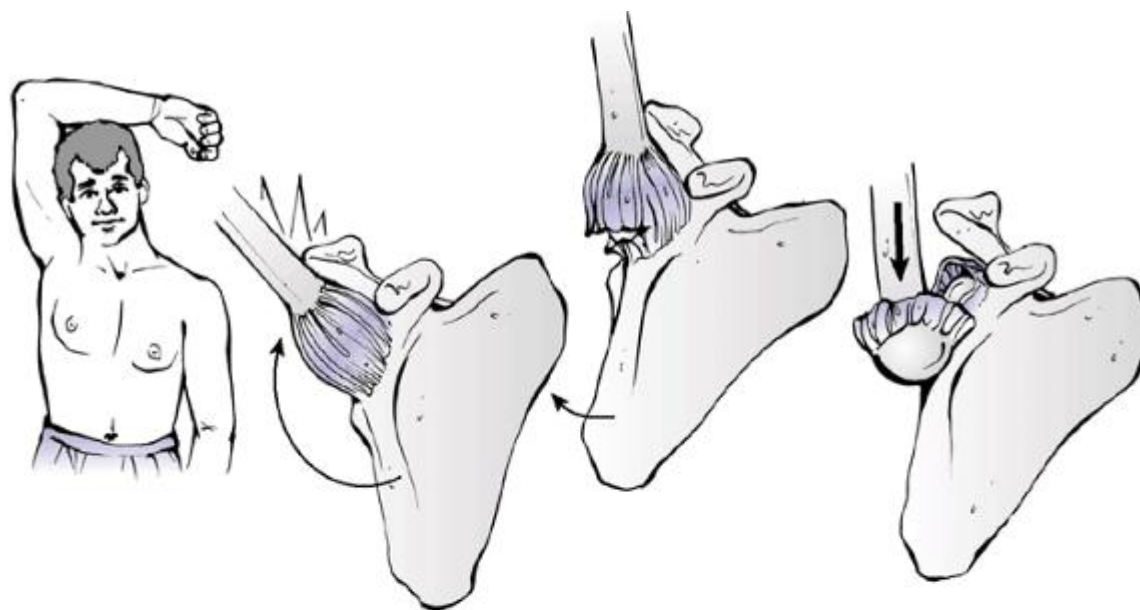
# Treatment

- Closed reduction requires full muscle relaxation, sedation, and analgesia.
- With the patient supine, traction should be applied to the adducted arm in the line of deformity with gentle lifting of the humeral head into the glenoid fossa.

# INFERIOR GLENOHUMERAL DISLOCATION

- It results from a hyperabduction force causing impingement of the neck of the humerus on the acromion, which levers the humeral head out inferiorly.





A



B

# Clinical Evaluation

- Patients typically present in a characteristic salute fashion, with the humerus locked in 110 to 160 degrees of abduction and forward elevation. Pain is usually severe.
- The humeral head is typically palpable on the lateral chest wall and axilla.
- A careful neurovascular examination is essential, because neurovascular compromise almost always complicates these dislocations.

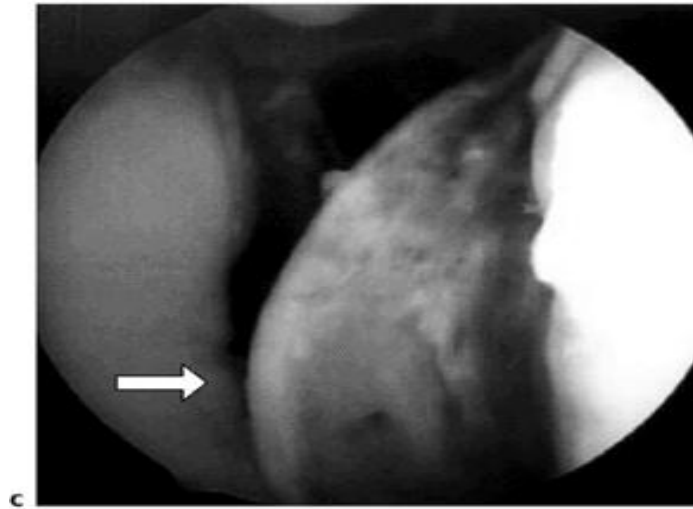
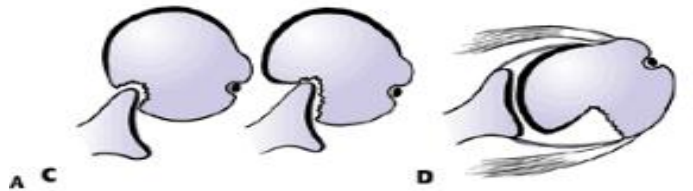
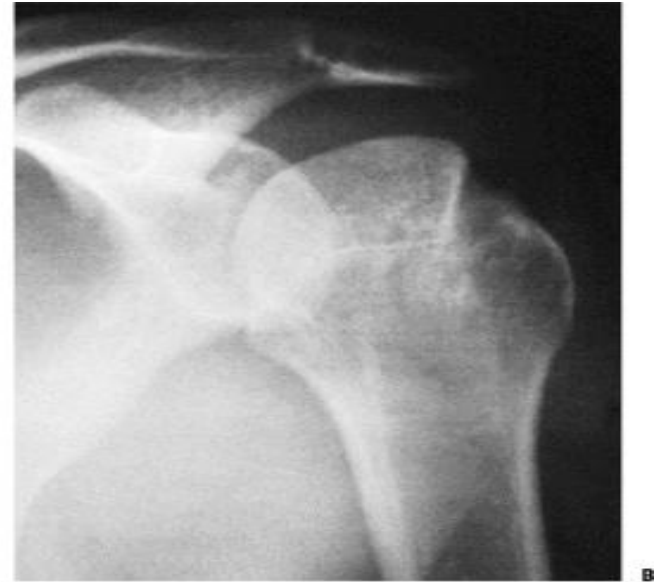
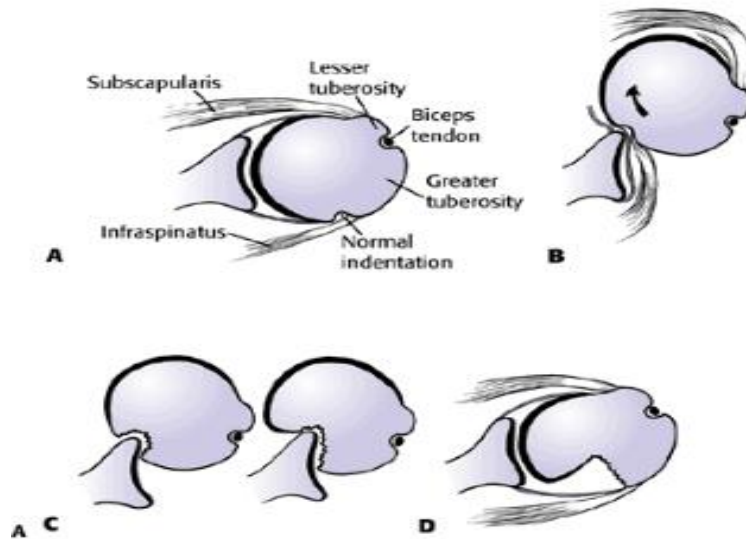
# Treatment

- Reduction may be accomplished by the use of traction-countertraction maneuvers.
- Axial traction should be performed in line with the humeral position (superolaterally), with a gradual decrease in shoulder abduction. Countertraction should be applied with a sheet around the patient, in line with, but opposite to the traction vector.
- The arm should be immobilized in a sling for 3 to 6 weeks, depending on the age of the patient. Older individuals may be immobilized for shorter periods to minimize shoulder stiffness

# Recurrent shoulder dislocation

- The traumatic detachment of the glenoid labrum (*Bankart lesion*)
- Excessive laxity of the shoulder capsule from a single macrotraumatic event or repetitive microtraumatic events .
- Hill-Sachs lesion:- humeral head impaction fracture can be produced as the shoulder is dislocated anteriorly, and the humeral head is impacted against the rim of the glenoid at the time of dislocation
- This Hill-Sachs lesion is a defect in the posterolateral aspect of the humeral head . Instability results when the defect engages the glenoid rim in the functional arc of motion at 90 degrees abduction and external rotation as described

# Hill-sachs lesion



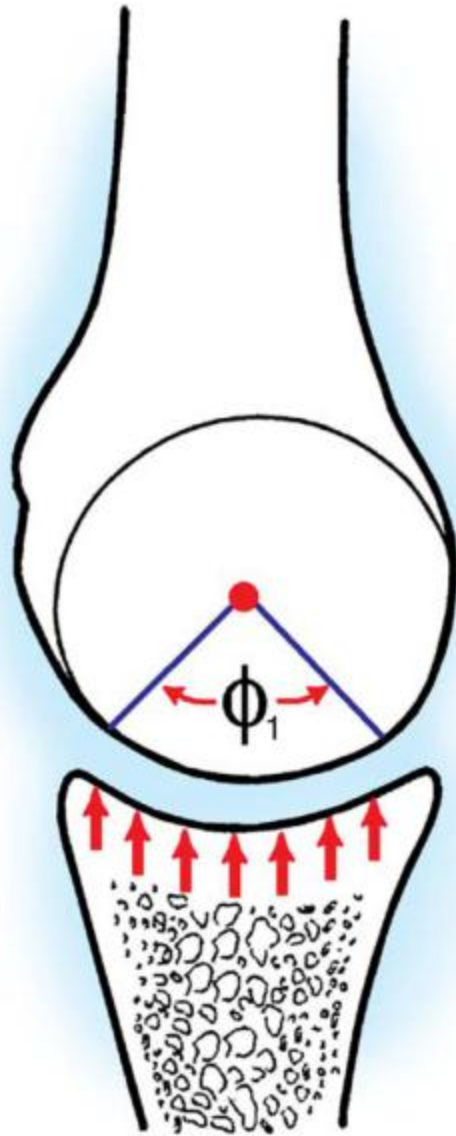


Stryker notch view for humeral head defects. The patient is in the supine position with the arm flexed to 120 degrees so that the hand can be placed on the top of the head. The x-ray beam is then angled approximately 10 degrees. The x-ray can clearly reveal the presence of any (arrow) osseous defects

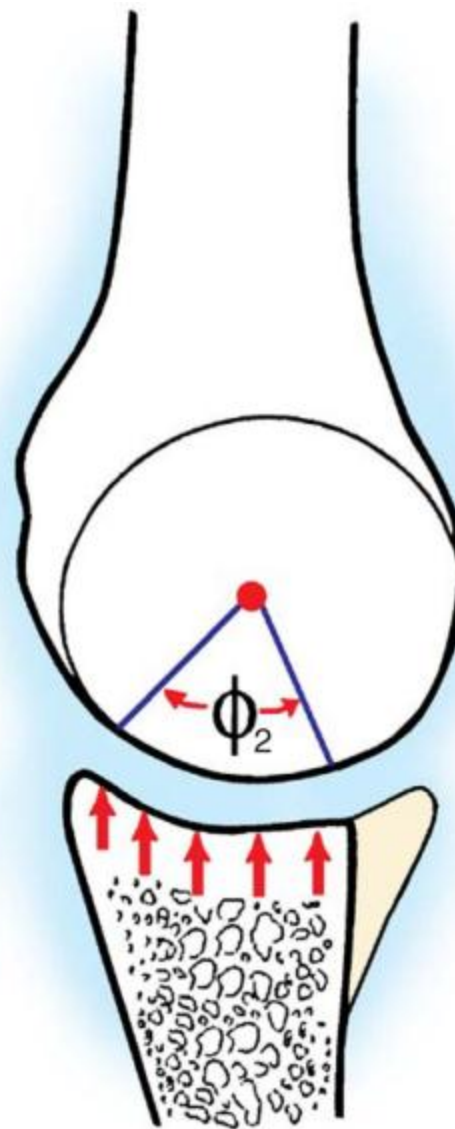


Glenoid rim fractures also can occur with •  
an anterior or posterior dislocation. If these  
lesions involve more than 20% of the  
glenoid, they can result in recurrent  
instability.

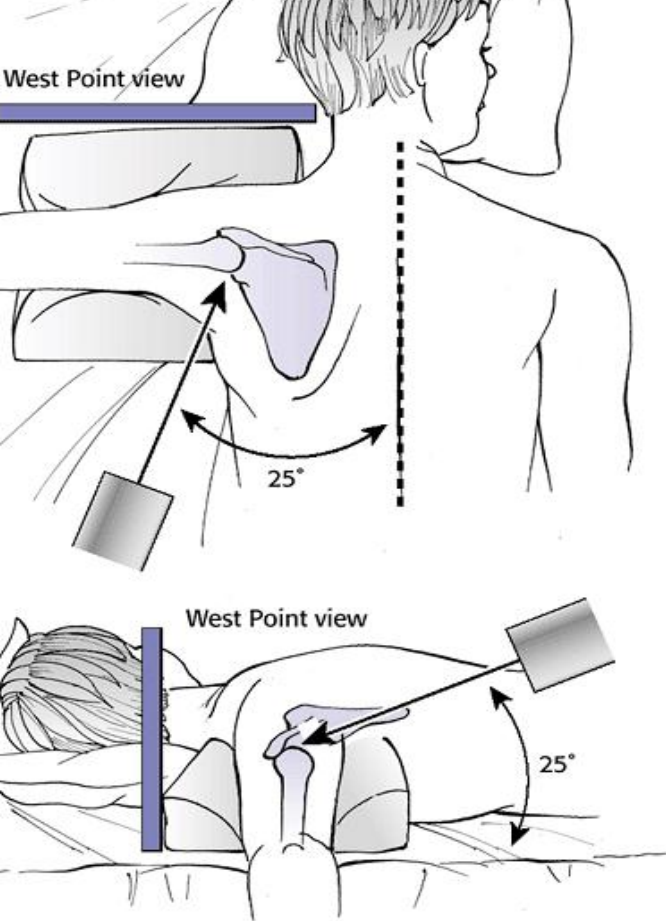




Normal glenoid



Bone-deficient glenoid



West Point view for the •  
 identification of a glenoid rim lesion.  
 This x-ray is taken with the patient  
 in the prone position. The beam is  
 angled approximately 25 degrees  
 to provide a tangential view of (A)  
 the glenoid. In addition, the beam is  
 to (B) angled 25 degrees downward  
 highlight the anterior and posterior  
 aspects of the glenoid. In this  
 fashion, the entire glenoid rim can  
 .(C) be clearly visualized



# Classification of shoulder instability

- The direction of instability as unidirectional, bidirectional, or multidirectional.
- The degree of instability :- sublaxation or dislocation
- The duration of the symptoms :-acute, subacute, chronic, or recurrent . The dislocation is classified as chronic if the humeral head has remained dislocated longer than 6 weeks
- The type of trauma associated with the dislocation :-  
macrotraumatic, in which a single traumatic event results in dislocation, or microtraumatic (acquired), in which repetitive trauma at the extremes of motion results in plastic deformation of the capsulolabral complex.

- The patient's age :-recurrence rates of more than 90% in patients younger than 20 years old. patients older than 40 years old had a recurrence rate of about 10%.
- The mental set of the patient -:Some patients with posterior instability learn to dislocate their shoulder through selective muscular contractions and in these patients surgical treatment is doomed to failure

# The drawer test



The drawer test. While stabilizing the scapula with one hand, the other hand grasps the humeral head. A gentle pressure is then applied toward the center of the glenoid. At the same time, the humeral head is manually translated in the anterior and in the posterior direction .



# Sulcus test



The sulcus test for inferior instability of the shoulder. With the patient in the sitting position, a downward traction is placed on the adducted arm) A .( With a positive test )B ,(excessive inferior translation produces a dimple )arrow (on the lateral aspect of the acromion

# Apprehension and surprise test



- The apprehension(test and the fulcrum) for anterior instability. With the patient supine, the shoulder is abducted and externally rotated such that it is in a position vulnerable to dislocation. Symptomatic patients will report the sensation of apprehension or “getting ready to dislocate.”



The apprehension (test and the relocation test for anterior instability. With the patient supine, the shoulder is abducted and externally rotated such that it is in a position vulnerable to dislocation. With a positive relocation test, the apprehension is reduced with a posteriorly directed force on the shoulder .



# The jerk test



The jerk test for posterior instability. With the patient in or supine either sitting position, the arm is abducted and internally rotated. An axial load is then placed on the humerus while the arm is moved horizontally across the body. With a positive test, patients demonstrate a sudden jerk when the humeral head slides off of the back of the glenoid and when it is reduced back onto the glenoid

B

# Acronyms for Types of Recurrent Shoulder Instability

- TUBS:  
    *T*raumatic  
    *U*nidirectional  
    *B*ankart lesion  
    *S*urgery is often necessary.

AMBRI:

*A*traumatic  
    *M*ultidirectional  
    *B*ilateral  
    *R*ehabilitation is the primary mode of treatment.  
    *I*nferior capsular shift is often performed if surgery is indicated

# Operative Treatment for Anterior Instability

- a) failed appropriate nonoperative therapy •
- b) recurrent dislocation at a young age •
- ‘c) irreducible dislocation •

# Arthroscopic Procedures

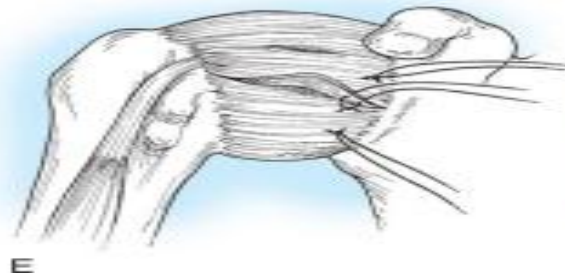
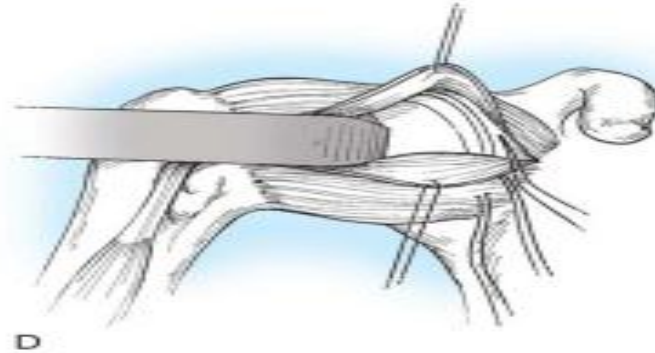
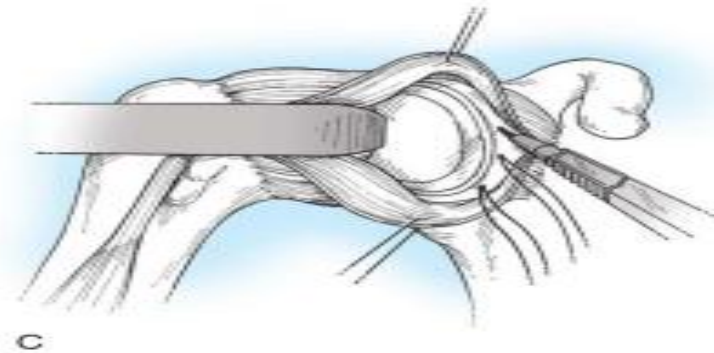
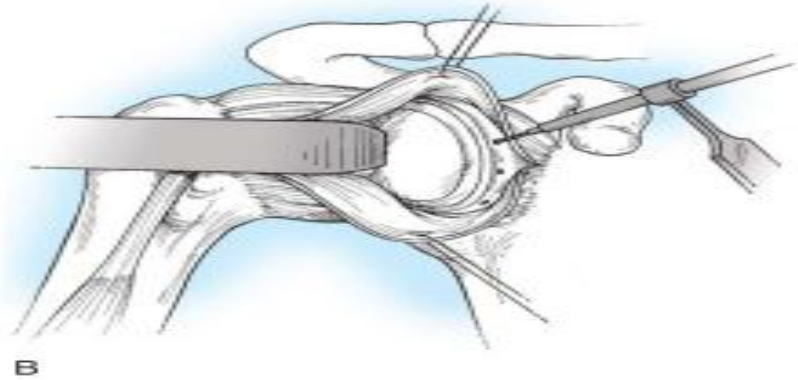
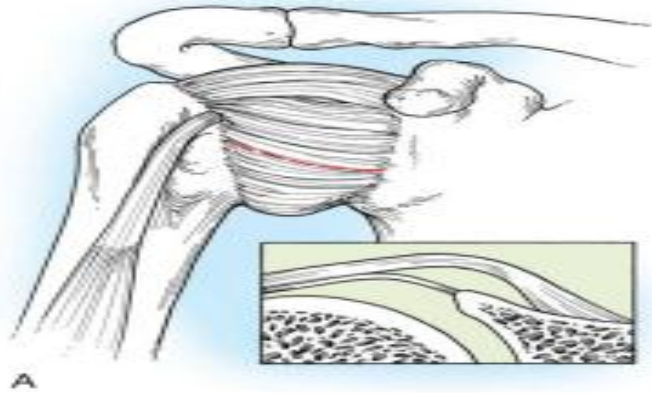
- arthroscopic Bankart procedure
- thermal capsulorrhaphy
- Rotator cuff repair

# Open Soft Tissue Procedures

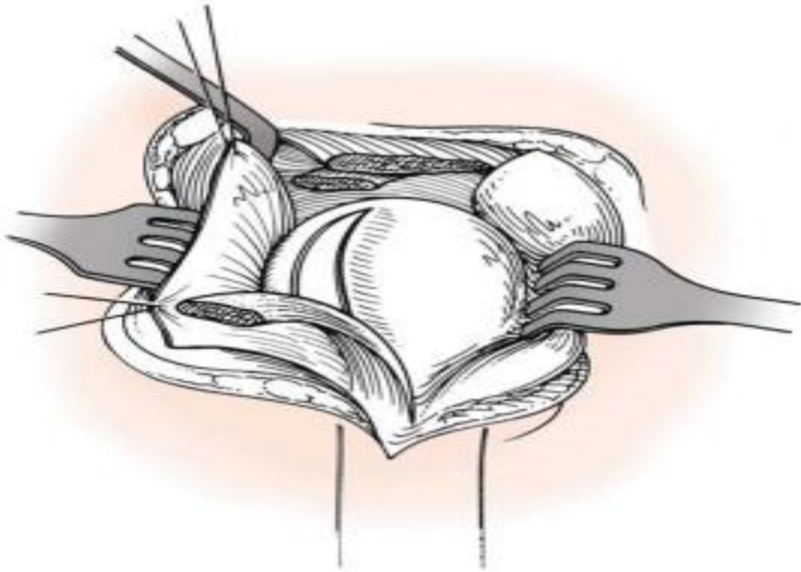
Bankart procedure:-In this procedure, the labral defect is identified and the labrum is mobilized and then reattached to its original anatomic site on the anterior inferior glenoid rim by drill holes in the glenoid or by suture anchors

- The two flaps of the capsule are then imbricated on each other by shifting the inferior flap superiorly and the superior flap inferiorly

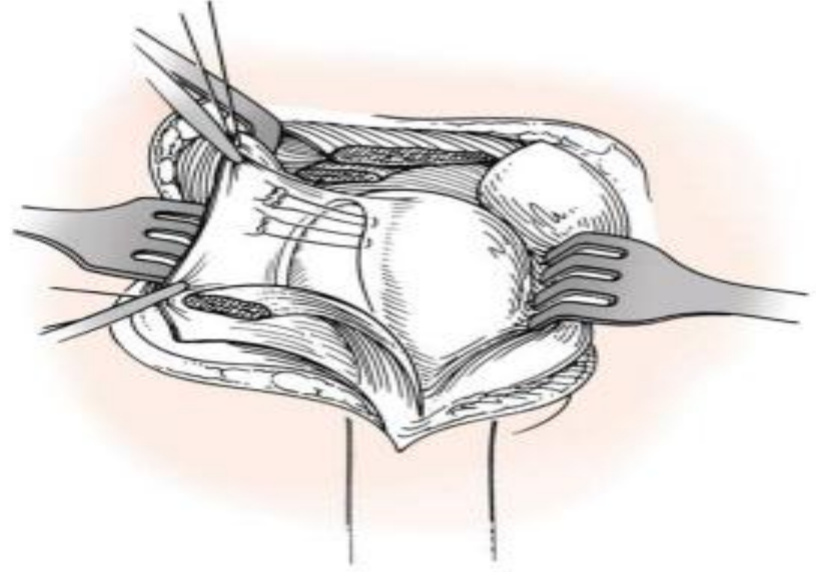
# Modified Bankart Repair



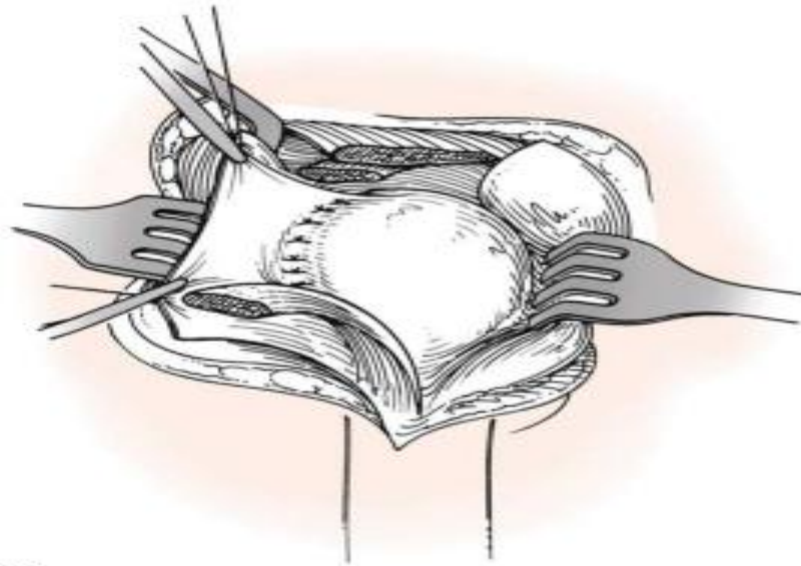
# Putti-Platt Operation



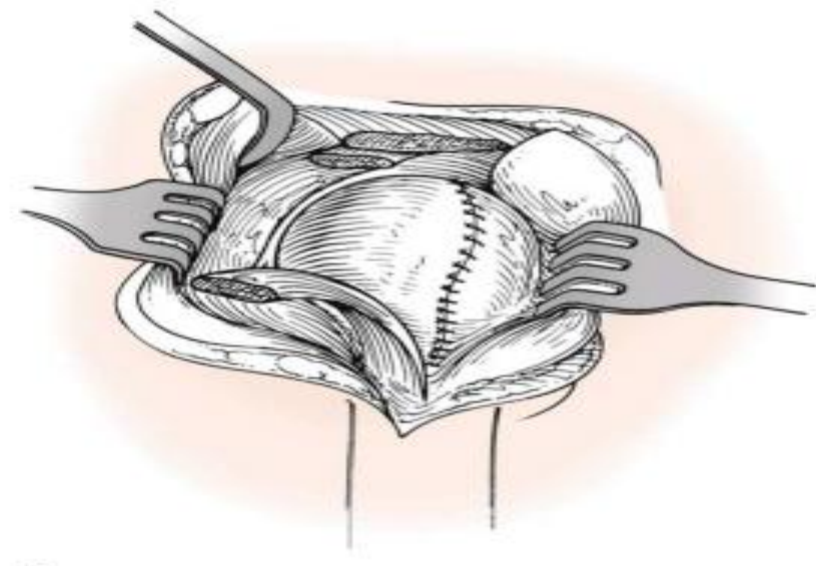
A



B



C

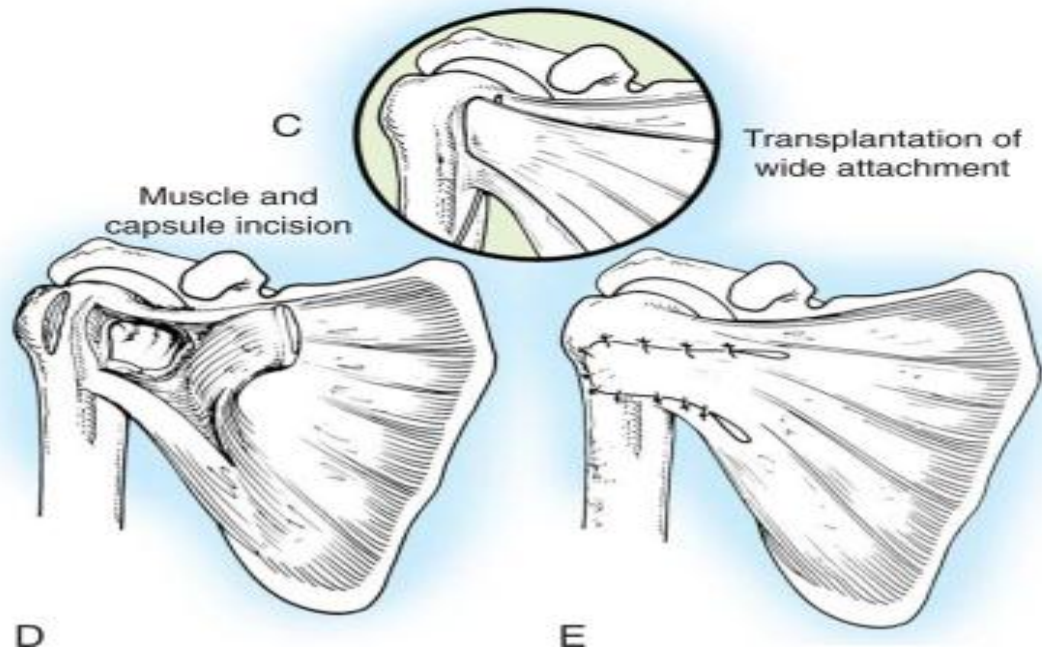
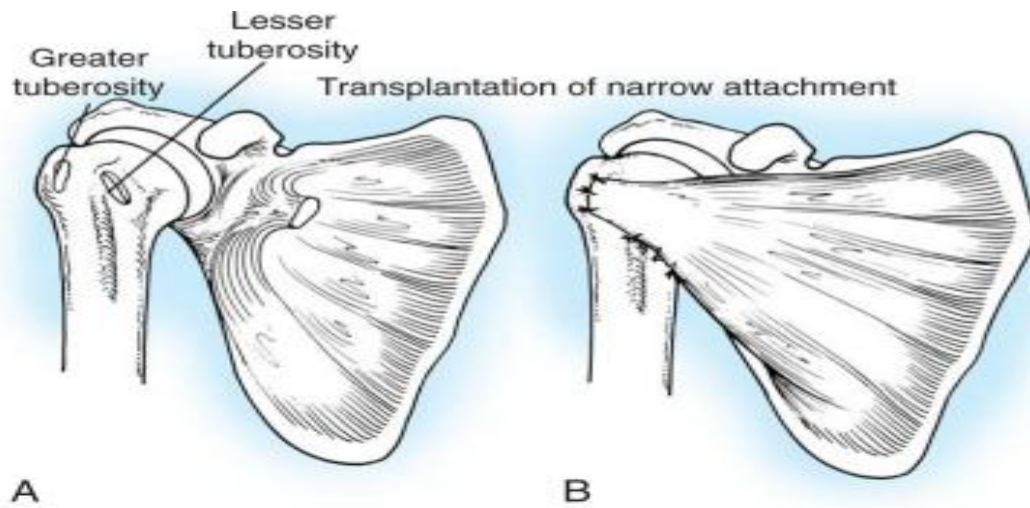


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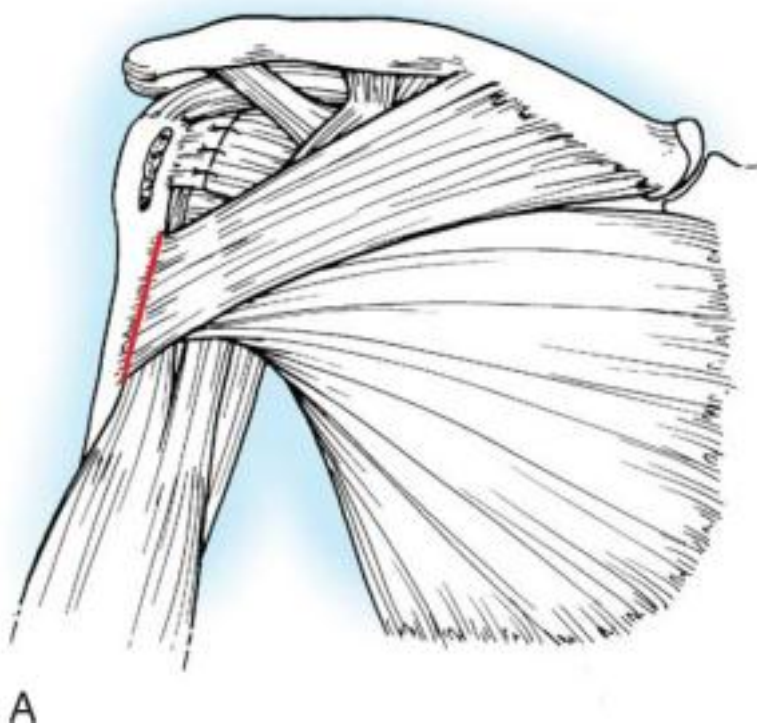
# Magnuson-Stack procedure

- the insertion of the subscapularis tendon is transferred from the lesser tuberosity to a position that is lateral to the bicipital groove. With this technique, the primary goal is to create a tight anterior soft tissue sling that will support the humeral head against anterior translation .





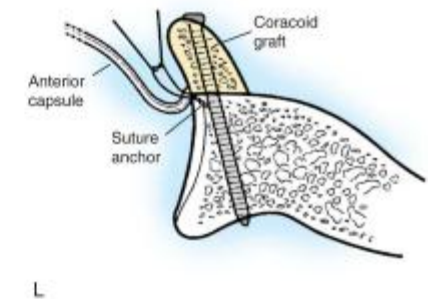
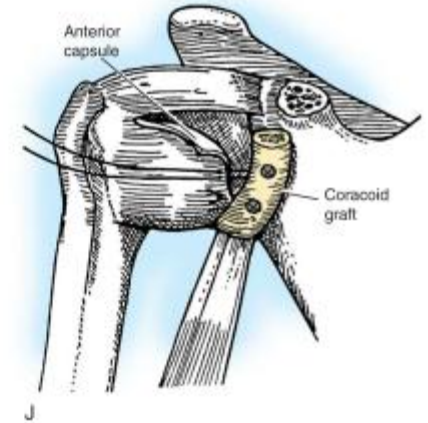
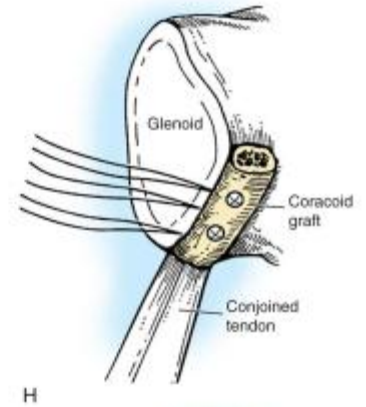
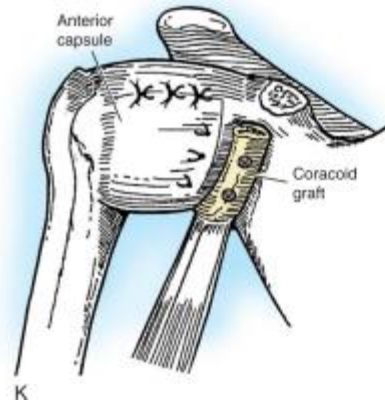
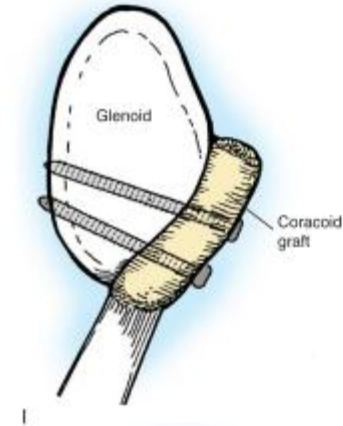
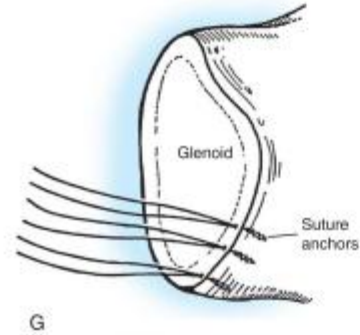
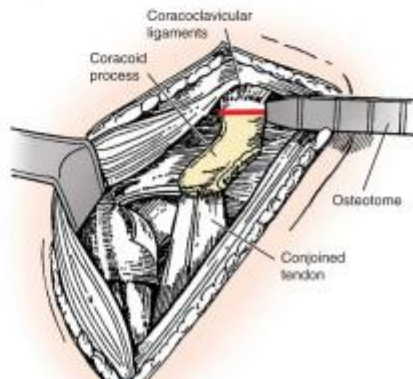
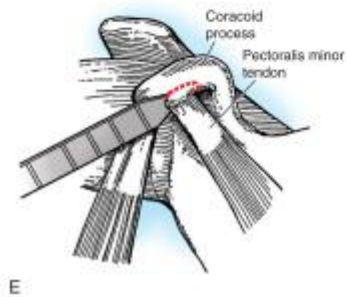
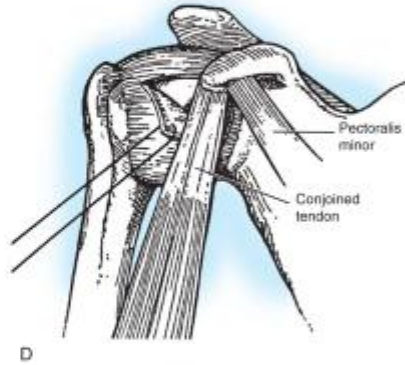
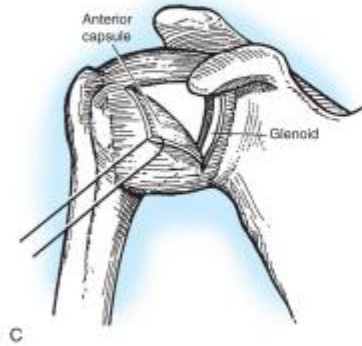
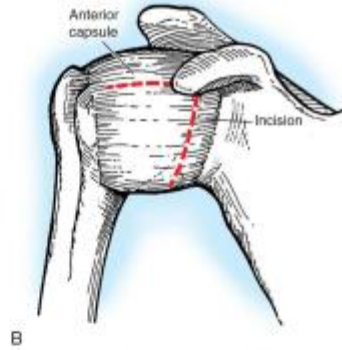
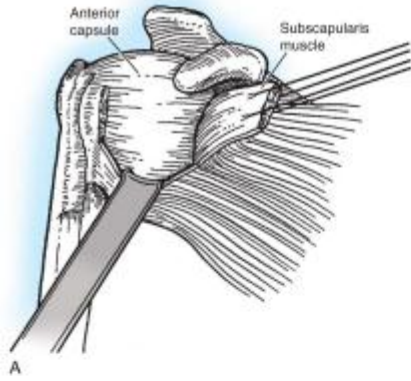
# Pectoralis major transfer for treatment of subscapularis deficiency



# Open Bony Procedures

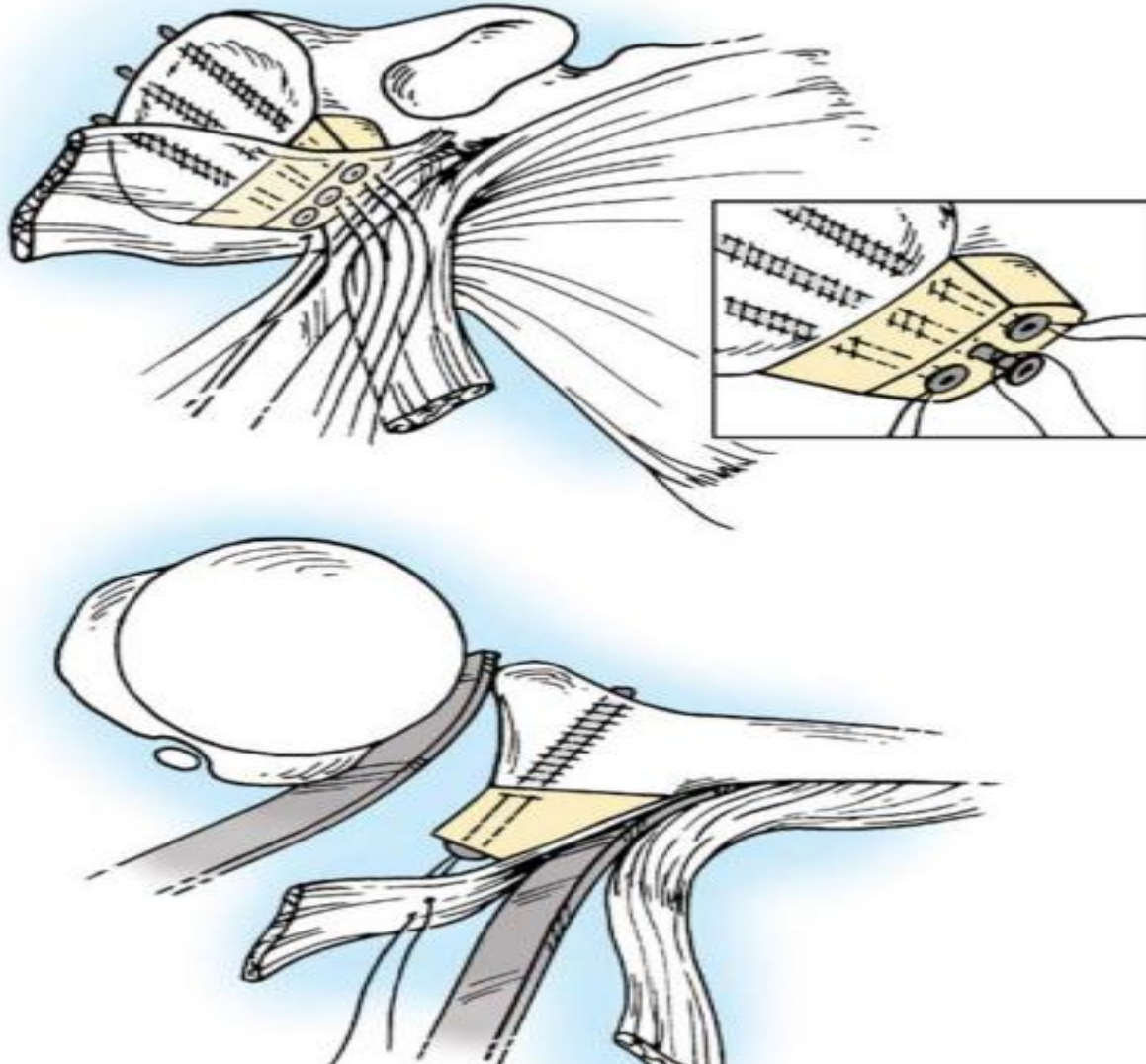
- a piece of bone is placed on the glenoid neck such that additional surface is extended onto the native glenoid. The graft provides additional surface to interact against the humeral head and to act as a buttress against anterior dislocation.

# Burkhart and DeBeer





# glenoid reconstruction with iliac bone graft



For large Hill-sacks defect:- transfer of subscapularis tendon to fill the defect

The use of lesser tuberosity with its attached subscapularis tendon

Thank you