DISLOCATION OF SHOULDER

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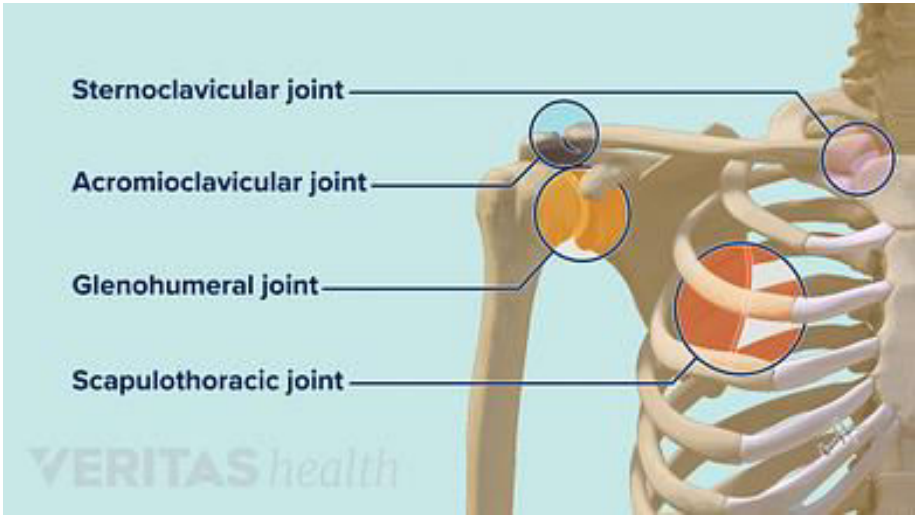
INTRODUCTION

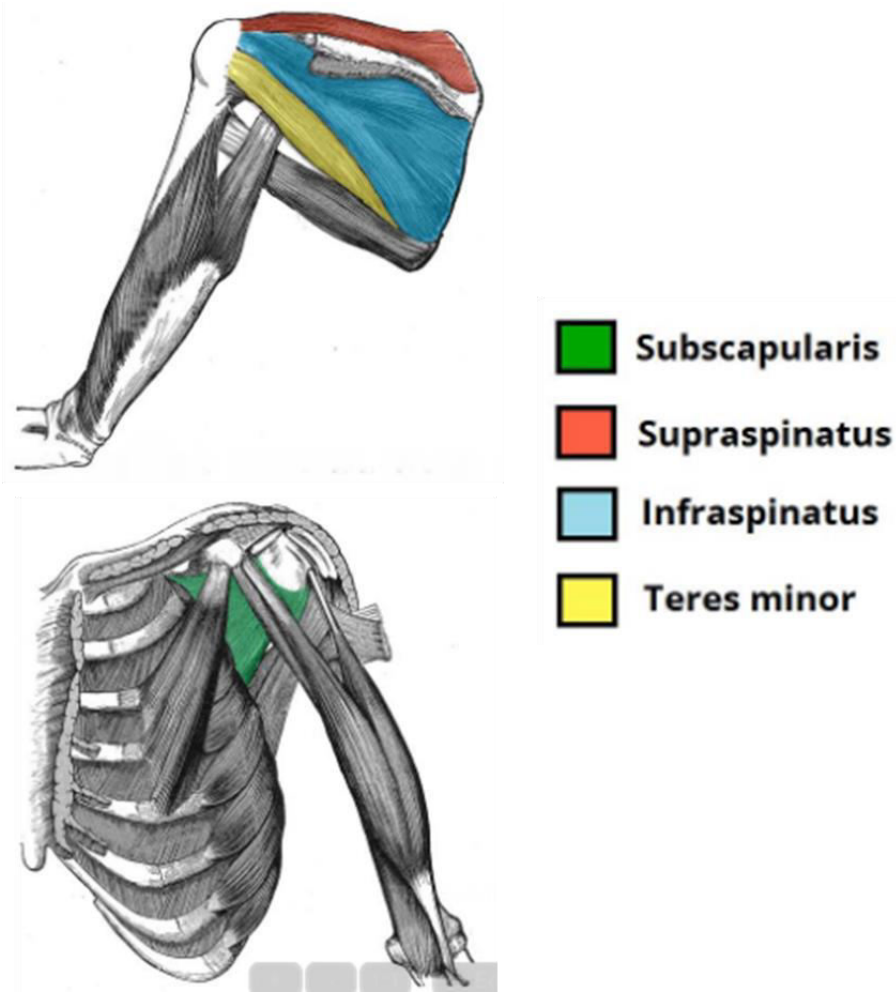
- Shoulder joint is a ball and socket joint.
- It is formed by scapula and clavicle (which is also called as shoulder girdle)and proximal humerus.
- It has the greatest range of motion than any other joint in the body.
- Due to wide range of movement it is most unstable joint.
- Joints in the Shoulder Complex
    1. Glenohumeral
    2. Acromioclavicular
    3. Sternoclavicular
    4. Scapulothoracic



Muscles of shoulder joint

- The muscles of the shoulder girdle provide vital stability for the mobile shoulder joint

The rotator cuff muscles (supraspinatus, Infraspinatus, Teres minor and Subscapularis) to stabilize the humeral head in the glenoidfossa, also have roles in shoulder rotation movements.



Shoulder Dislocations

- A joint is dislocated when its articular surfaces are wholly displaced one from the other, so that all apposition between them is lost.
- It is most unstable large joint.

CLASSIFICATION

- 1.Acute Dislocation - Anterior dislocation
  - Posterior dislocation
  - Inferior dislocation
- 2. Recurrent dislocation

ANTERIOR DISLOCATION

Mechanism of injury – Due to direct or indirect force.

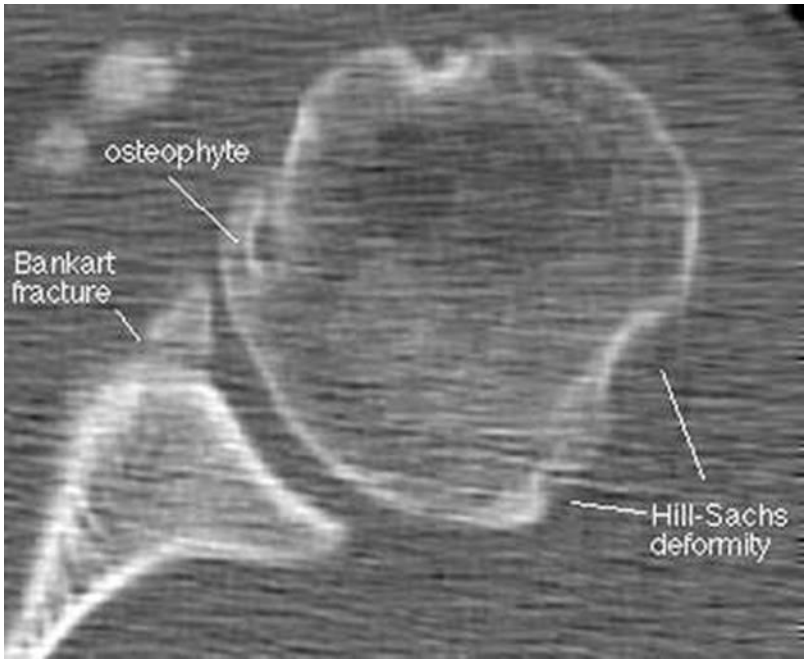
- Direct blow from the posterior aspect of the shoulder
- Indirect force – fall on an out stretched hand with the shoulder abducted and externally rotated most common mechanism.

Depending on the position of dislocated head it is further classified into three types

- Pre glenoid -the head lies in front of the glenoid
- Sub coracoid -the head lies below the coracoid process
- Sub clavicular -the head lies below the clavicle

Pathological changes

- **1) Bankarts lesion:** due to stripping of the glenoidal labrum along with the periosteum from the anterior surface of glenoid and scapular neck
- **2) Hill sachs Lesion:** this is a depression on the humeral head in its postero lateral qaudrant caused by impingement by the anterior edge of glenoid.
- 3) Roundening off of the anterior glenoid rim



CLINICAL FEATURES –

- Severe pain
- Arm is held in position of abduction and external rotation and the elbow is supported with opposite hand.
- Adduction is restricted.

ON EXAMINATION-

- Normal contour of shoulder is lost, it becomes flattened.
- Fullness is present below clavicle.

Special test-

- **Dugas test-** Inability to touch opposite shoulder.
- **Hamilton ruler test-** tip of acromion and lateral epicondyle of humerus can be joined by a ruler.
- **Callaway test-** vertical circumference of axilla is increased as compared to the normal side.
- **Regiment badge sign-** it is an area of anaesthesia around deltoid due to injury to axillary nerve.

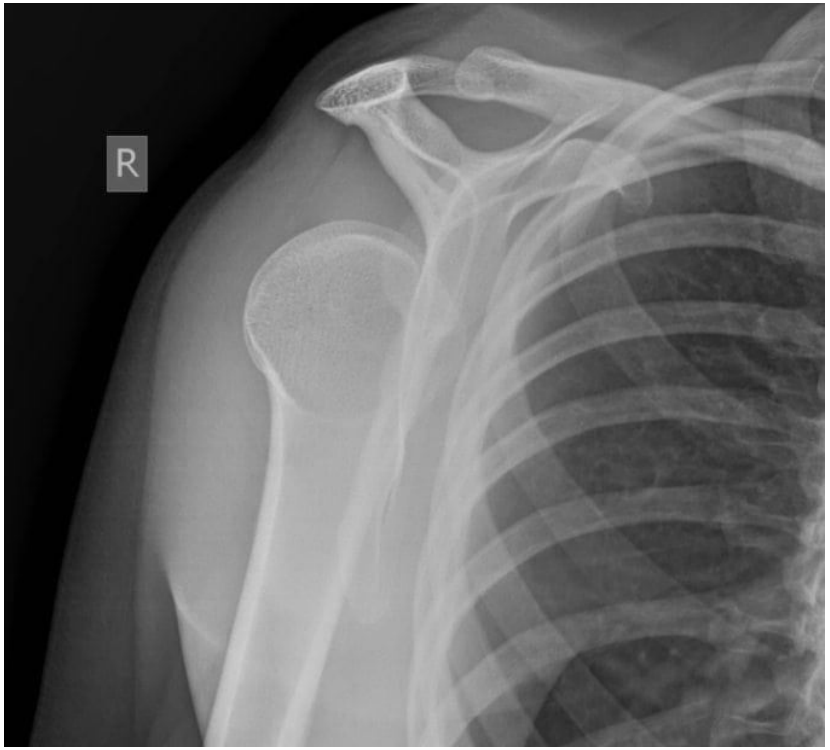
POSTERIOR DISLOCATION

Mechanism of injury-

- Direct force –blow from anterior aspect of shoulder
- Indirect force- due to Fall on a out streched hand with shoulder in internal rotation and adduction.
- During an epileptic attack or electric shock.
- It is a rare condition so the diagnosis is often missed.
- Types 1.SUB ACROMIAL

  2.SUB GLENOID

  3.SUB SPINOUS



PATHOLOGICAL CHANGES

- Similar to Hillsachs lesion, it is found on anteromedial aspect of head of humerus.

CLINICAL FEATURES-

- severe pain
- Arm is held in position of adduction and internal rotation
- Abduction is restricted

EXAMINATION

- The front of the shoulder may look flat .
- Patient may have the normal contour of the shoulder.

INFERIOR DISLOCATION

- Luxatio erecta
- Extremely rare variety
- Head of humerus is pushed down below the glenoid

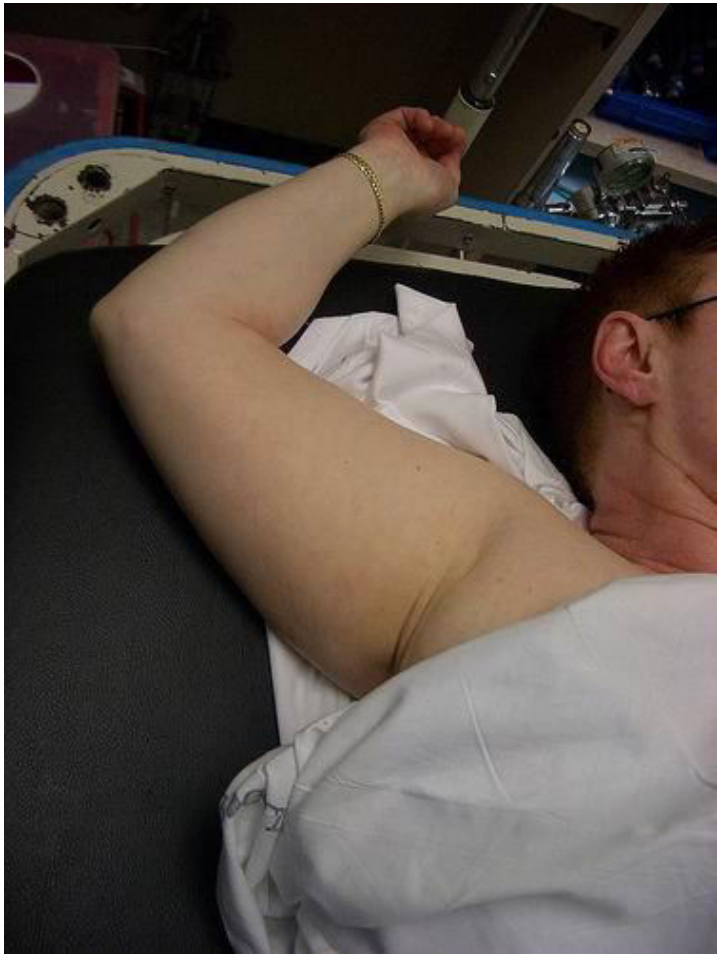
MODE OF INJURY

- Severe hyperabducton force.

EXAMINATION

- Arm is held in wide abduction –elevation almost by the side of head,this occurs when the limb is strongly abducted.

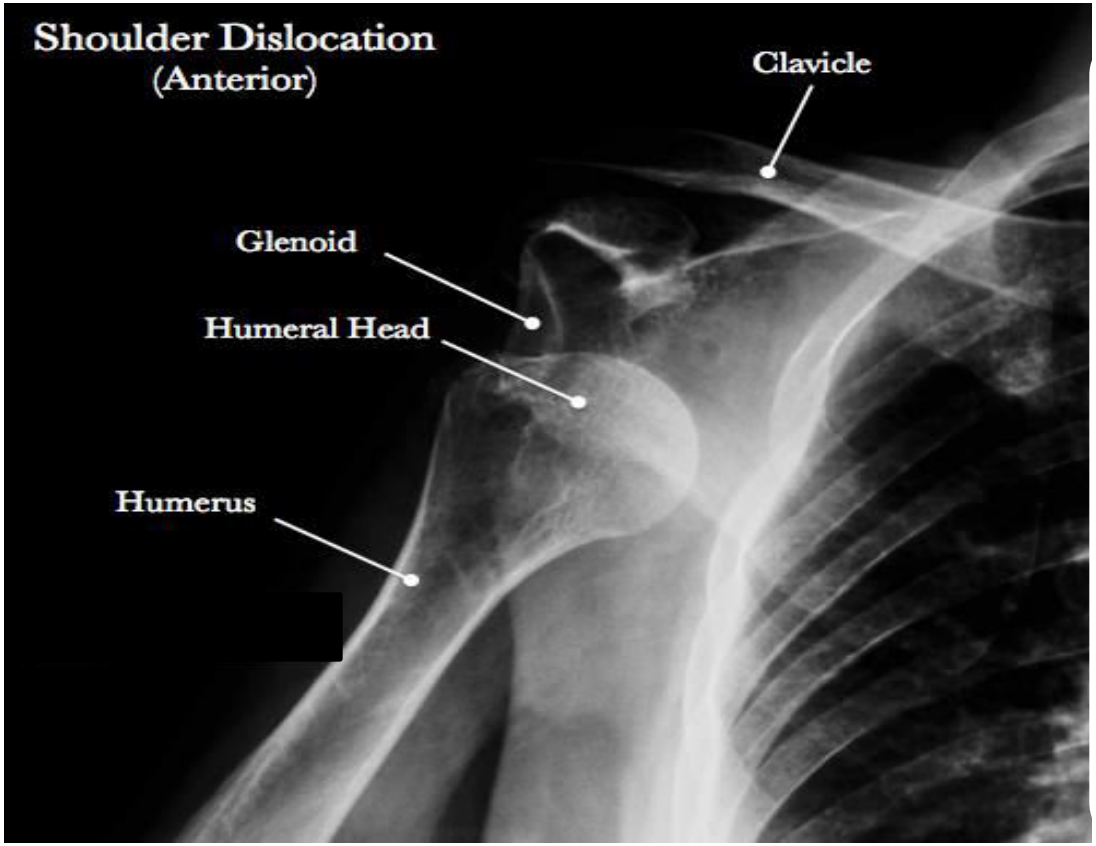
LUXATIO ERECTA

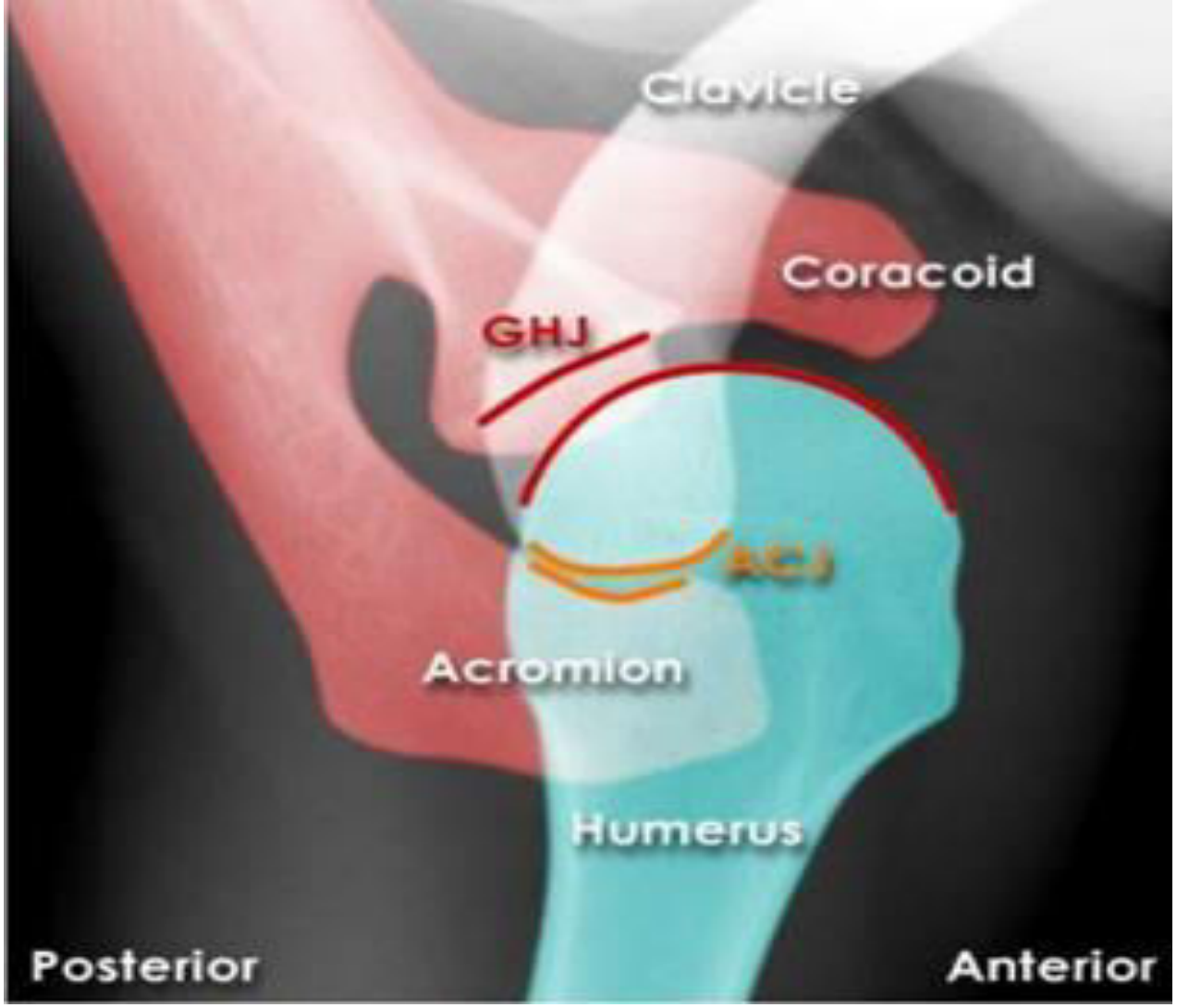


MANAGEMENT OF ANTERIOR SHOULDER DISLOCATIONS

Xray

- The AP x-ray will show the overlapping shadows of the humeral head and glenoid fossa, with the head usually lying below and medial to the socket.





Normal Axial view

the glenohumeral joint is aligned normally

the acromioclvicular joint is aligned normally

Axial view- anterior dislocation

humeral head surface is no longer aligned with the glenoid

Humeral head lies anterior to the glenoid

Management

- **Emergency**
- Should be reduced in < 24 hours or else AVN of head of humerus
- Immobilised strapped to the trunk for 3-4 weeks and rested in a collar and cuff

NONOPERATIVE TREATMENT

- **CLOSED REDUCTION FOR ACUTE DISLOCATION**

- Under i.v. analgesia + sedation
- Under intra-articular lignocaine
- If initial closed reduction unsucessful , degree of sedation & analgesia evaluated , if not successful , under G.A for closed / open reduction

REDUCTION MANOEUVERS

Traction-countertraction

Traction-Countertraction

- Note how the clinician on the left has the sheet wrapped around him, allowing him to use his body weight to create traction.
- Some clinicians employ gentle external rotation to the affected arm while providing traction.

Hippocrates Method

Surgeon applies sustained traction to arm and counter traction is by keeping his foot into the axilla the foot acts as a fulcrum against which the head placed into its position.

Stimpson's Technique

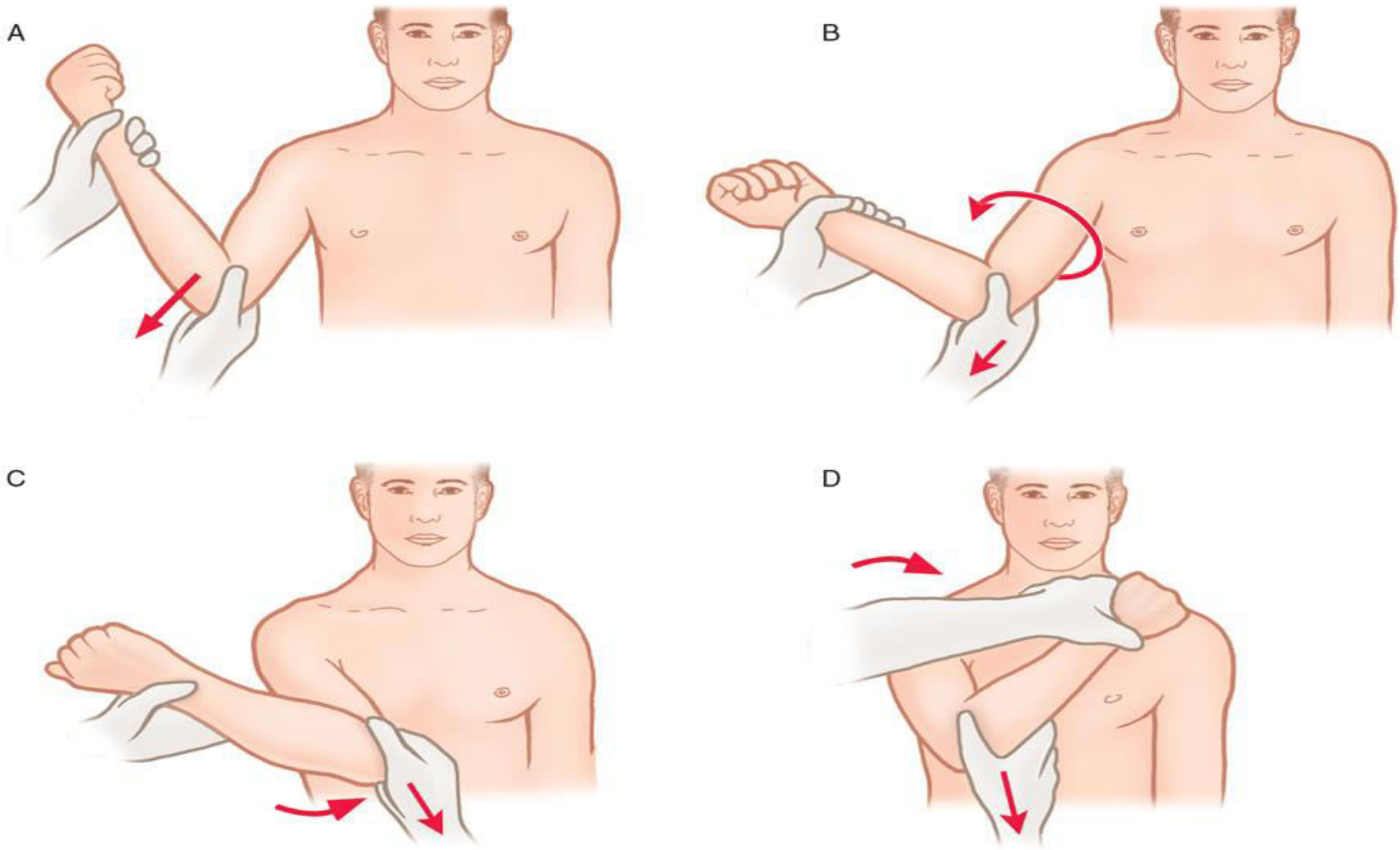
- The patient is placed prone on the stretcher with the affected shoulder hanging off the edge.
- Weights (10-15 lbs) are fastened to the wrist to provide gentle, constant traction.

Stimpson's technique

KOCHERS MANOEUVRE :

- commonly used method.
- Traction – with the elbow flexed to a right angle steady traction is applied along the long axis of humerus
- External rotation- arm is rotated externally
- Adduction of arm
- Internal rotation of arm

KOCHERS TECHNIQUE



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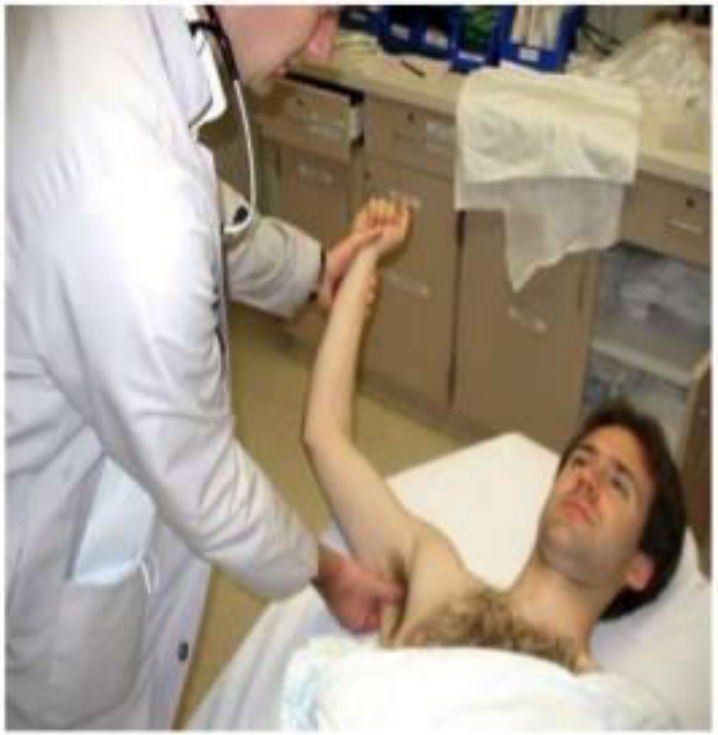
Milch's Technique

- The arm is abducted and the physician's thumb is used to push the humeral head into its proper position.
- Gentle traction in line with the humerus is provided with the physician's opposite hand.



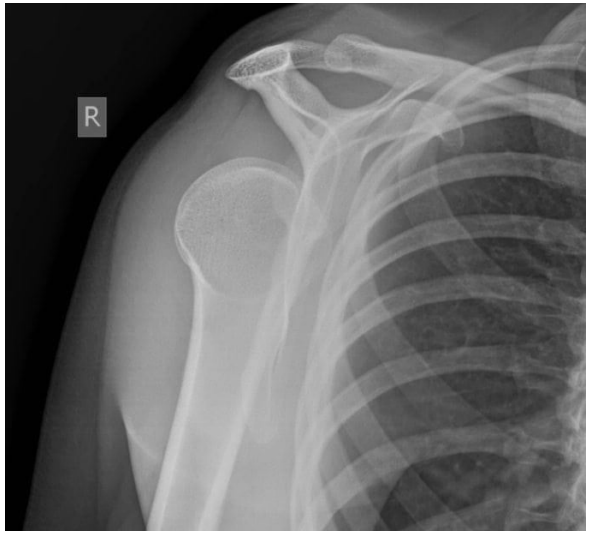
Management

- The arm is rested in a sling for about three weeks in those under 30 years of age (who are most prone to recurrence) and for only a week in those over 30 (who are most prone to stiffness).
- Then movements are begun, but combined abduction and lateral rotation must be avoided for at least 3 weeks.
- Throughout this period, elbow and finger movements are practised every day.

POSTERIOR DISLOCATION

X-RAYS

- AP radiograph Of shoulder showing over lapping shadow of humeral head and the glenoid and an empty glenoid Fossa.
- In This x-ray-Humeral head looks abnormal d/t medial rotation -- ELECTRIC BULB SIGN
- An axial view radiograph shows subluxation/ dislocation with indentation of anterior aspect of humerus head.



POSTERIOR SHOULDER DISLOCATION REDUCTION

- The underlying approach to the traction-countertraction technique demonstrated in this photograph is similar to that employed in the reduction of anterior dislocations.
- The notable difference is positioning. Note that the patient is upright and the clinician providing traction is standing in front of the patient.

NONOPERATIVE

- **Acute reduction and immobilization in external rotation for 4 to 6 weeks**
  - Indications
    - Should be initially attempted for all acute traumatic posterior dislocations
  - Most dislocations reduce spontaneously
  - Technique
    - Immobilize in 10-20 degrees of external rotation with elbow at side
    - After 6 weeks advance to physical therapy (rotator cuff strengthening and periscapular stabilization) and activity modification (avoid activities that place arm in high-risk position)

INFERIOR DISLOCATION X-rays

XRAY

- The humeral shaft is shown in the abducted position with the head sitting below the glenoid.
- It is important to search for associated fractures of the glenoid or proximal humerus.

  - NOTE: True inferior dislocation must not be confused with postural downward displacement of the humerus, which results quite commonly from weakness and laxity of the muscles around the shoulder, especially after trauma and shoulder splintage; here the shaft of the humerus lies in the normal anatomical position at the side of the chest.
  - The condition is harmless and resolves as muscle tone is regained.

Reduction

TREATMENT

- Inferior dislocation can usually be reduced by pulling upwards in the line of the abducted arm, with counter-traction downwards over the top of the shoulder.
- If the humeral head is stuck in the soft tissues, open reduction is needed.
- It is important to examine again, after reduction, for evidence of neurovascular injury.
- The arm is rested in a sling until pain subsides and movement is then allowed, but avoiding abduction for 3 weeks to allow the soft tissues to heal.

OPERATIVE TREATMENT

Indications :

- ❖ Recurrent dislocation at young age
- ❖ Open dislocation
- ❖ Irreducible dislocation
- ❖ Unstable joint reduction

Surgical options :

- ❖ Arthroscopic repair
- ❖ Open technique with soft tissue repair
- ❖ Open technique with bony augmentation

OPERATIVE

- Arthroscopic Bankart repair +/- capsular shift
- Open Bankart repair +/- capsular shift
- Latarjet (coracoid transfer) and Bristow Procedures for glenoid bone loss
- Autograft (tricortical iliac crest) or allograft (iliac crest or distal tibia) for glenoid bone loss
- Remplissage technique for Hill Sachs defects
- Bone graft reconstruction for Hill Sachs defects
- Putti-Platt / Magnuson-Stack / Boyd-Sisk

OPEN PROCEDURE

- **BANKART REPAIR** – ReattachMent of glenoid labrum and inferior glenohumeral ligament to anterior glenoid often combined with capsular shift.

- **LATARJET CORACOID TRANSFER** – Distal 2cm of coracoid transfer to anerior glenoid neck with two screw fixation and reattachment of coracoacromial ligament to anterior glenohumeral capsule.

- **ANTERIOR CAPSULOLABRAL RECONSTRUCITON-** Glenoid based capsular shift designed for over head athletes.

SUPPLEMENTARY PROCEDURES

- **REMPLISSAGE**- Arthroscopic infra spinatous and posterior capsule fixation into hillsachs lesion using suture anchors.

- **HUMERAL HEAD ALLOGRAFT-** Osteoarticular allograft inserted into hillsachs lesion.

- **PARTIAL HUMERAL HEAD RESURFACING-** Cobalt chrome component is inserted in to hill sachs lesion typically performed with latarjet.

- **ROTATOR INTERVAL CLOSURE-** Open or arthroscopic superior capsular shift of medial glenohumeral ligament to superior glenohumeral ligament.

REVISION SURGERIES

- **ALLOGENOUS BONE GRAFTING OF GLENOID-** Iliac crest or distal tibia secured to anterior glenoid neck with screws.

- **HUMERAL HEMIARTHROPLASTY** – Humeral component is retroverted to 50 degrees to achieve stability.

- **ROTATIONAL HUMERAL OSTEOTOMY-** Subcapital external rotation osteotomy to rotate hill sachs lesion outside glenoid track.

- **ALLOGRAFT ANTERIOR CAPSULOLABRAL RECONSTRUCTION- Allograft** tendon used to reconstruct anterior band of inferior glenohumeral ligament to middle glenohumeral ligament.

HISTORICAL PROCEDURES

- **BRISTOW CORACOID TRANSFER-** Distal 1 cm of coracoid transferred and secured with 1 screw coracoacromial ligament preserved.

- **CASPARI TECHNIQUE-** Arthroscopic transglenoid suture repair of glenoid labrum.

- **STAPLE CAPSULORRHAPHY-** Reattachment of capsule to glenoid neck with a staple.

- **PUTTI- PLATT** – Subscapularis shortening and advancement .

HISTORICAL PROCEDURES CONTD….

- **MAGNUSSON STACK** - Subscapularis transfer to greater tuberosity.

- **THERMAL CAPSULAR SHRINKAGE-** Use of thermal energy to reduce capsular volume.

COMPLICATIONS

EARLY

- ROTATOR CUFF TEAR
- AXILLARY NERVE INJURY
- AXILLARY ARTERY INJURY
- FRACTURE DISLOCATION

LATE

- SHOULDER STIFFNESS

RECURRENT SHOULDER DISLOCATION

- **Standard double-contrast arthrography** – helpful if excessive capsular capacity with an enlarged axillary pouch is noted .
- **CT with 3D reconstruction** – effectively shows bony lesions such as Hill-Sachs lesions , glenoid rim #s , glenoid version , some soft tissue abnormalities .
- **Double-contrast CT arthrography** – especially useful in patients without clear cut clinical signs of subluxation or dislocation , also showing soft tissue and labral defects .
- **Gadolinium-enhanced MRI** – best minimally invasive view of capsular or labral damage , detecting humeral avulsion of gleno humeral ligament (HAGL) lesions , which require repair **.**

NONOPERATIVE

- **Acute reduction, ± immobilization, followed by therapy**
  - **Indications**
    - management of first time dislocators remains controversial
  - **Reduction**
    - simple traction-countertraction is most commonly used
    - relaxation of patient with sedation or intraarticular lidocaine is essential
  - **Immobilization**
    - some studies show immobilization in external rotation decreases recurrence rates
    - thought to reduce the anterior labrum to the glenoid leading to more anatomic healing
    - subsequent studies have refuted this finding and the initially published results have not been reproducible
  - **Physical therapy**
    - strengthening of dynamic stabilizers (rotator cuff and periscapular musculature)

COMPLICATIONS

- **Recurrence**
  - often due to unrecognized glenoid bone loss treated with a soft tissue only procedure
  - can be due to poor surgical technique (ie, < 3 suture anchors)
  - increased risk with preoperative risk factors including age < 20, male sex, contact/collision sport
- **Shoulder pain**
- **Nerve injury**
  - musculocutaneous
  - axillary
- **Stiffness**
  - especially in external rotation
- **Infection**
- **Graft lysis (Latarjet)**
- **Hardware complications**
  - anchor pull-out (Bankart repair)
  - screw pull-out (Latarjet)
- **Chondrolysis**
  - historically due to use of thermal capsulorraphy (now contraindicated) or intra-articular pain pumps (now contraindicated)

THANK YOU