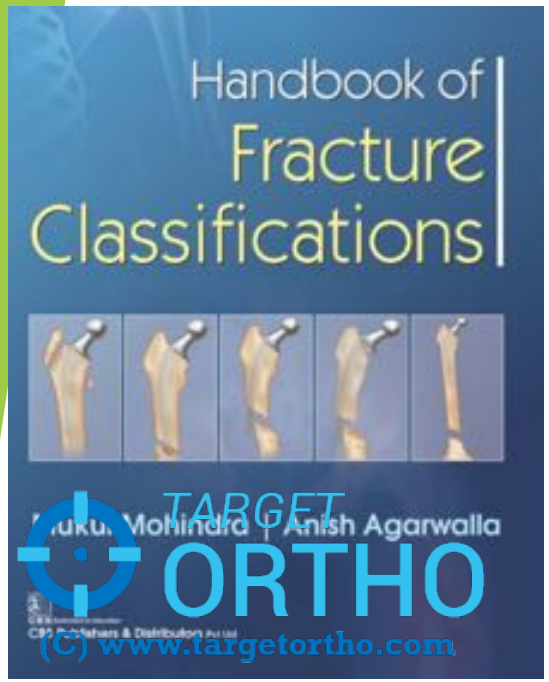
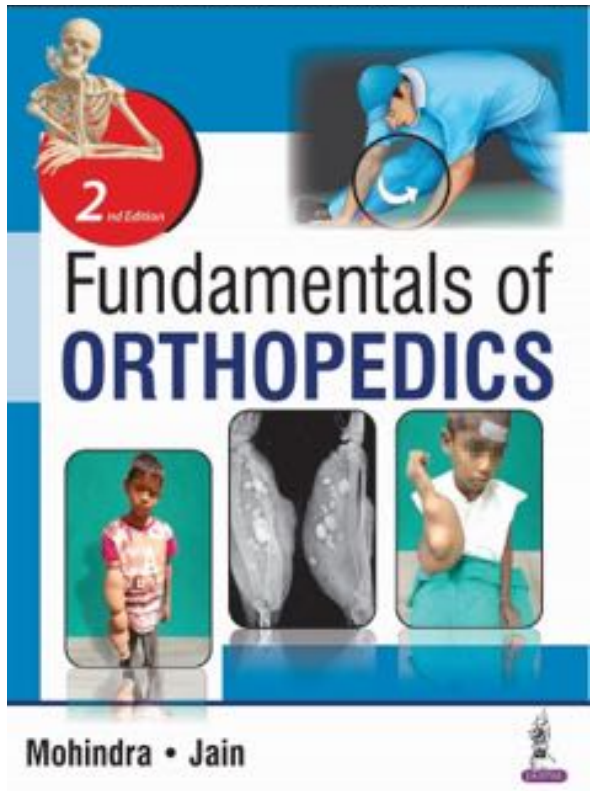
ANTERIOR SHOULDER INSTABILITY

DR.MUKUL MOHINDRA

M.S (Ortho), DNB, MNAMS
Dip. SICOT (Belgium)
FNB (Arthroscopy and Sports Medicine)
Fellowship (Minimally invasive arthroplasty), Athens (SICOT)

Specialist
CGHS Specialist Wing and CIO
Safdarjung Hospital
VMM College





INSTABILITY

- *Inability to maintain* the humeral head centered in the glenoid fossa and coracoacromial arch throughout ROM.
- Instability ≠ Joint laxity ≠ Subluxation/ Dislocation
- **Laxity** = *Incomplete* loss of glenohumeral articulation unassociated with pain
- **Subluxation** = *Partial* loss of glenohumeral articulation with symptoms
- **Dislocation** = *Complete* loss of glenohumeral articulation

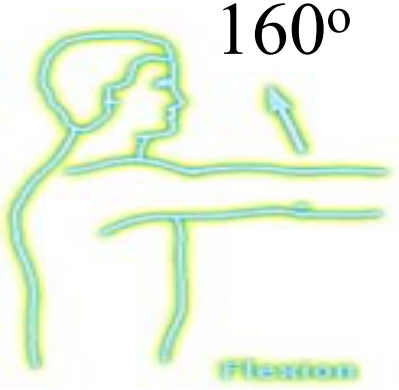
Highest MOBILITY

Pre-disposing Factors

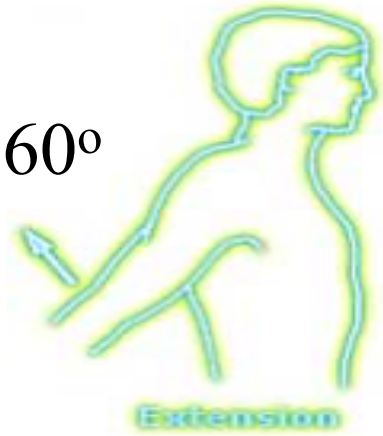
- ✓Age
- ✓Contact sports
- ✓Hyper-laxity

SHOULDER ROM

160°

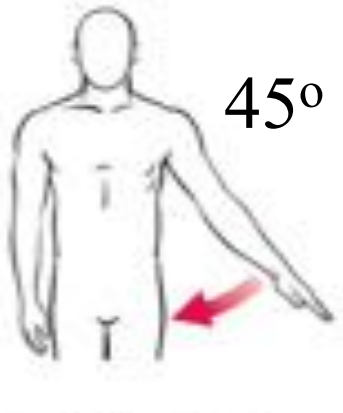


60°

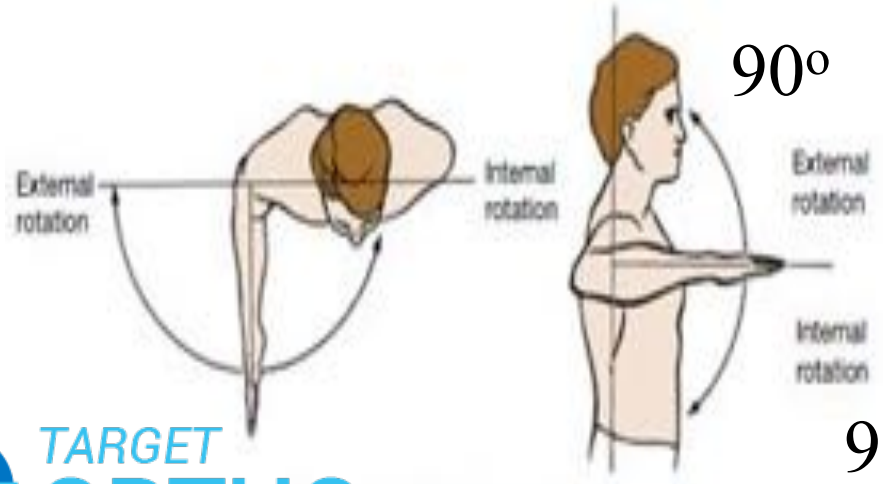


180°

45°

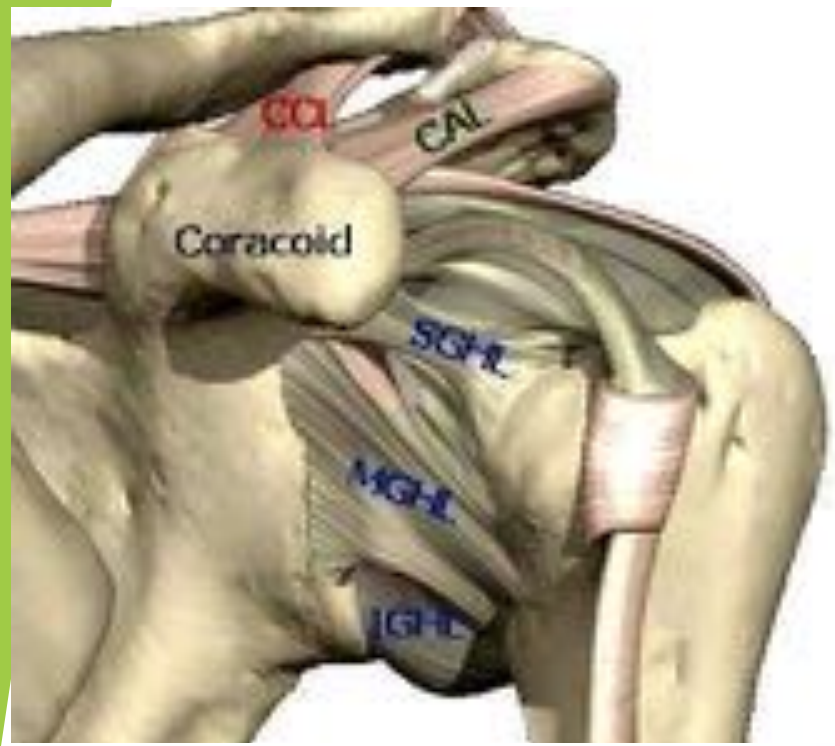


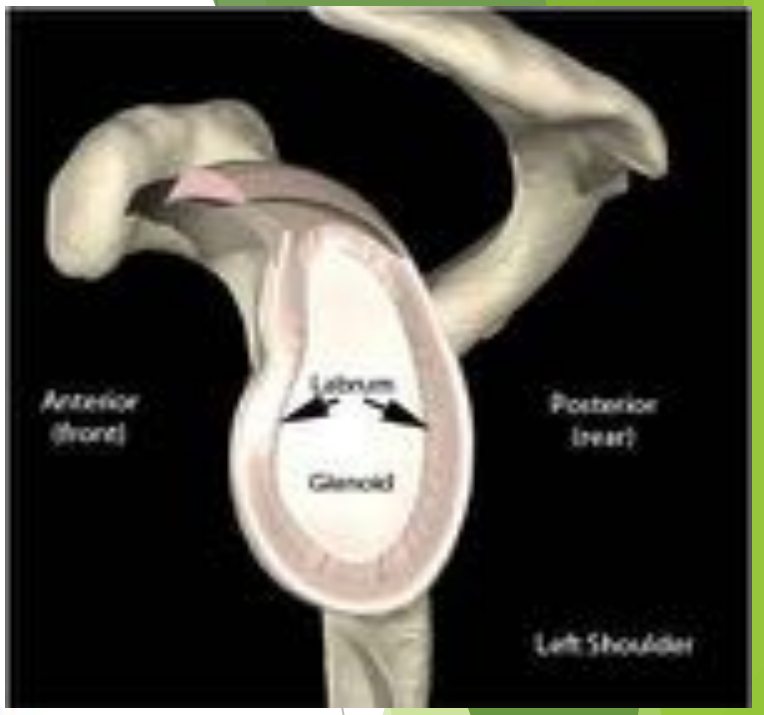
90°

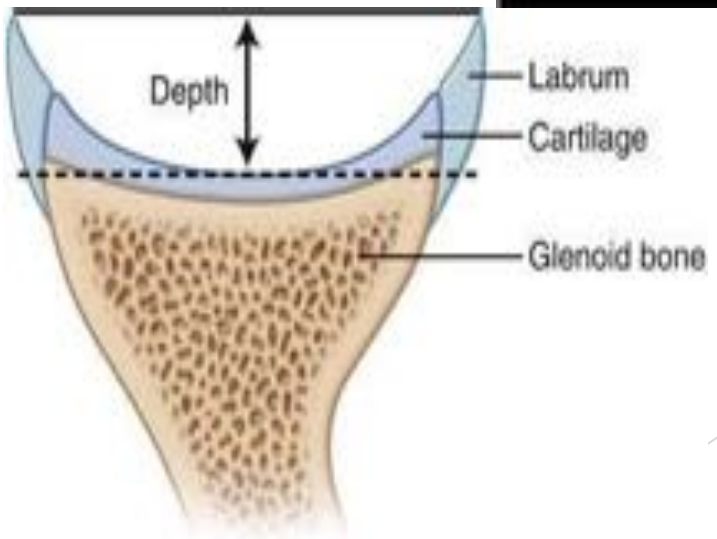


90°

RECURRENT SHOULDER INSTABILITY







CLASSIFICATION

Cause
- Traumatic event (macrotrauma)
- Atraumatic event (voluntary, involuntary)
- Microtrauma
- Congenital condition
- Neuromuscular condition (Erb's palsy, cerebral palsy, seizures)

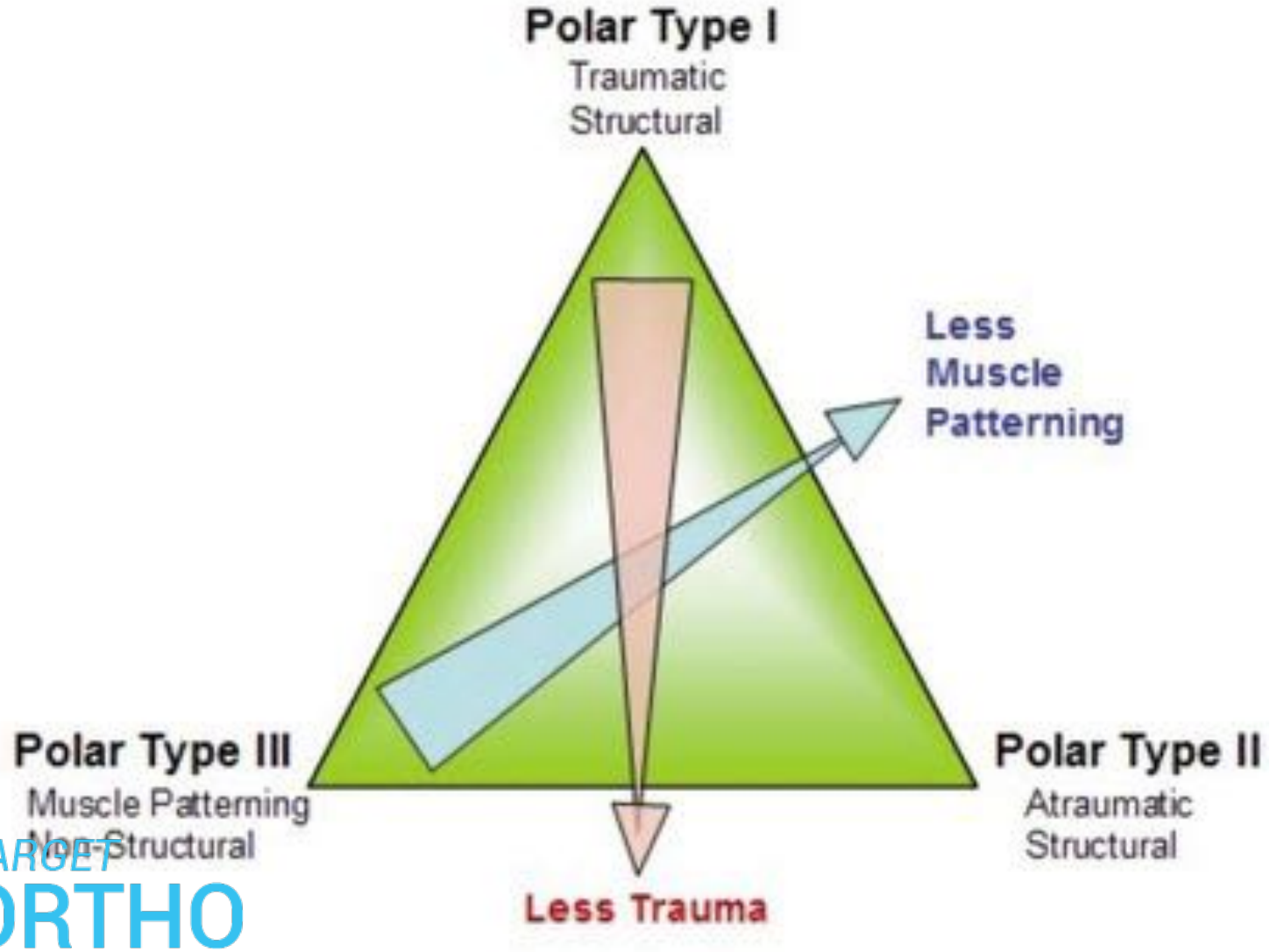
Direction
- Anterior
- Posterior
- Inferior
- Multidirectional

Degree
- Dislocation
- Subluxation
- Microtrauma (transient)

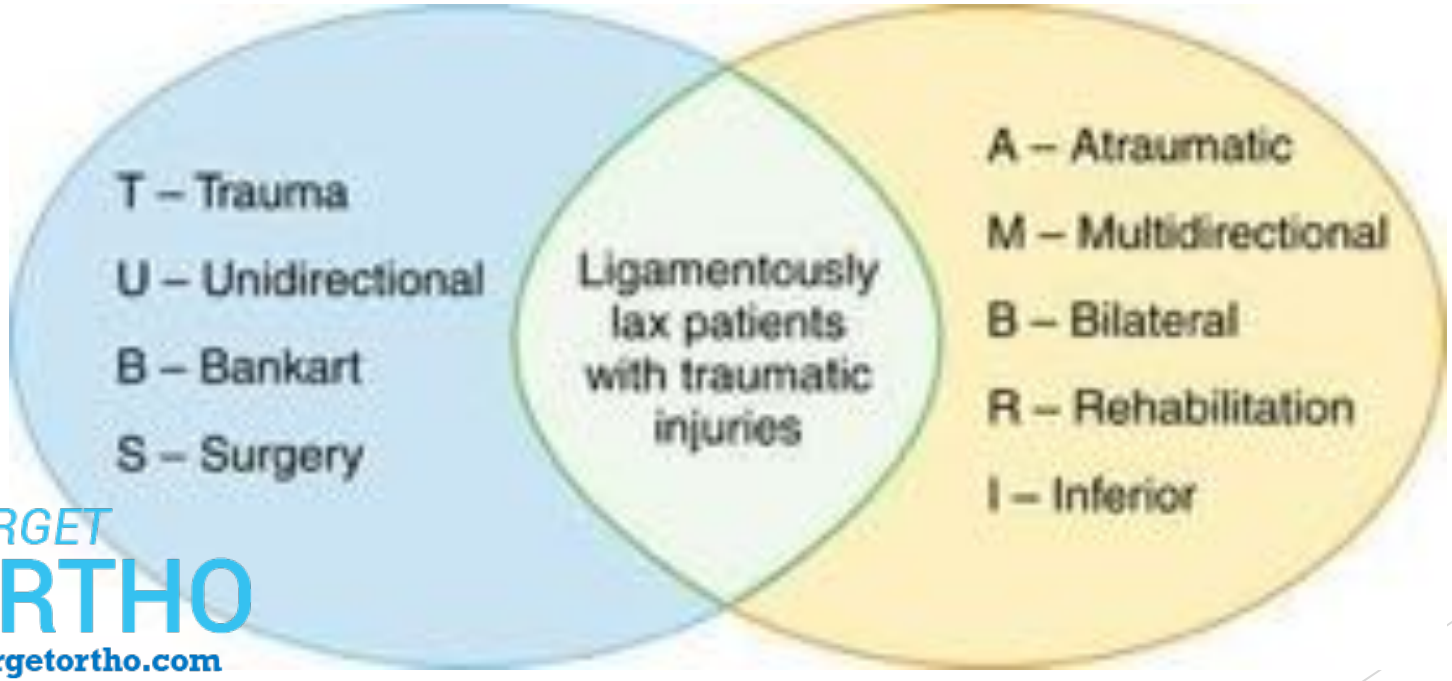
From Warner JJ, Altchek DW. Arthroscopic Repairs for Instability. In: Warner JJP, Iannotti JP, Gerber C, eds. *Complex and Revision Problems in Shoulder Surgery* Philadelphia: Lippincott–Raven Publishers, 1997: 19, with permission.

STANMORE CLASSIFICATION

Jaggi and Lambert, 2010



MATSEN's CLASSIFICATION



HISTORY

- Previous episode of dislocation/ subluxation
- Apprehension
- Chronic pain in abduction and external rotation

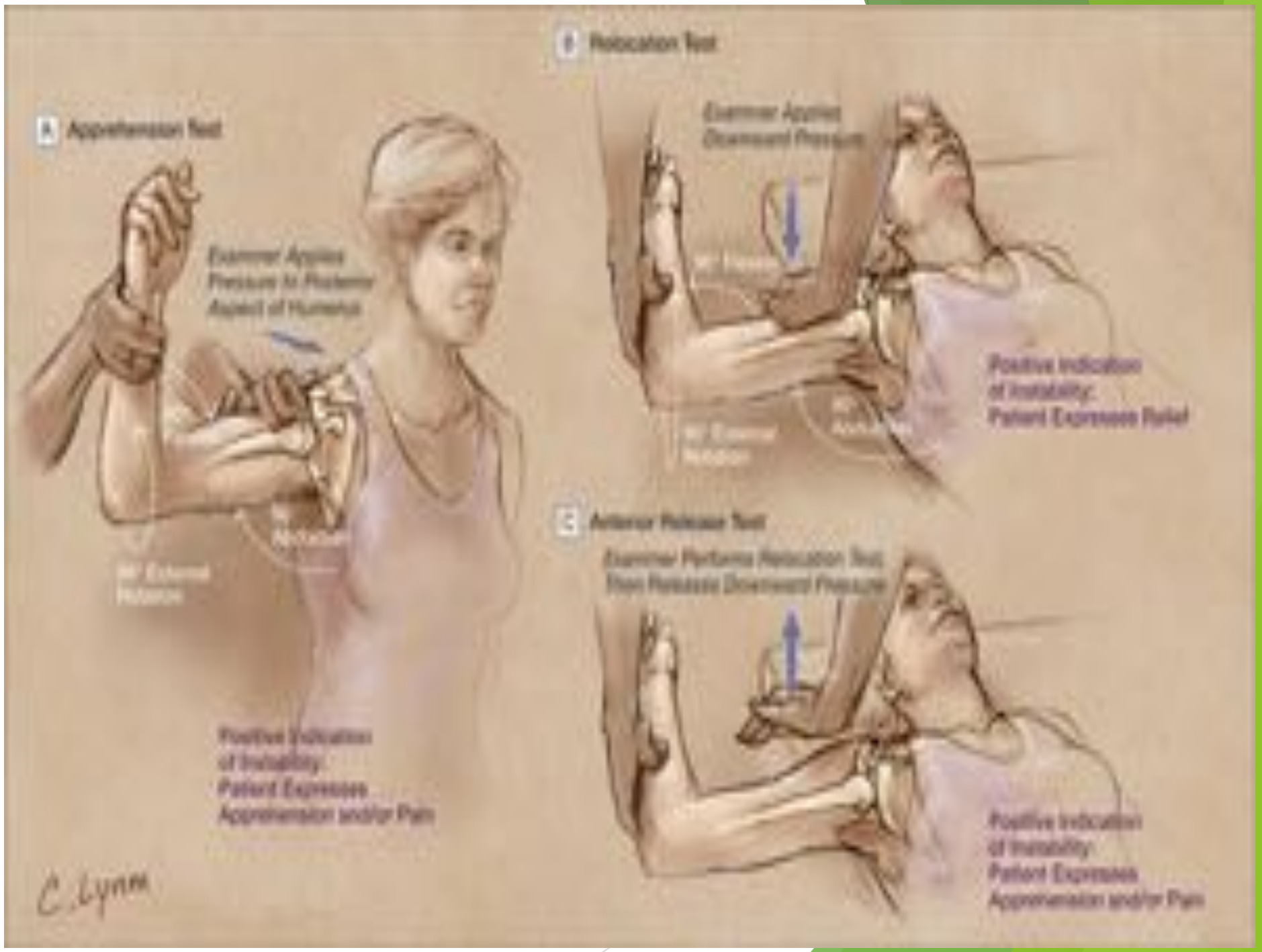
the **Unstable painful shoulder (UPS)** was *described by Boileau et al. in 2011*

As an indication of unrecognized anteroinferior instability that causes persistent pain in young athletes. These patients have anatomic lesions suggestive of instability; however, there is often no history of recurrent instability episodes.

CLINICAL TESTS

- LOAD AND SHIFT TEST
- APPREHENSION, RELOCATION, RELEASE TEST
- ROCKWOOD TEST
- ROWE TEST
- PRONE ANTERIOR INSTABILITY TEST
- ANDREW'S ANTERIOR INSTABILITY TEST
- ANTERIOR DRAWER TEST

Apprehension, Relocation and Release



Rowe Test

Patient lies supine & places the hand behind the head. The examiner places one hand (clenched fist) against the post. Humeral head & pushes up while extending the arm slightly.

POSITIVE test: apprehension or pain.

PRONE ANTERIOR INSTABILITY TEST

Prone. The examiner abducts the patient's arm to 90° and laterally rotates it 90°. While holding this position with one hand at the elbow, the examiner places the other hand over the humeral head and pushes it forward.

POSITIVE test: reproduction of patient's symptoms

ANDREW's ANTERIOR INSTABILITY TEST

Supine with shoulder Abducted 130˚ and laterally rotated 90˚. The examiner stabilizes the elbow and distal humerus with one hand & uses the other hand to grasp the humeral head & lift it forward.

POSITIVE test: reproduction of patient's symptoms

Rockwood Test

The examiner laterally rotates the shoulder at 0 degree. The arm is abducted to 45˚, and passive lateral rotation is repeated. Same procedure is repeated at 90˚ & 120˚.

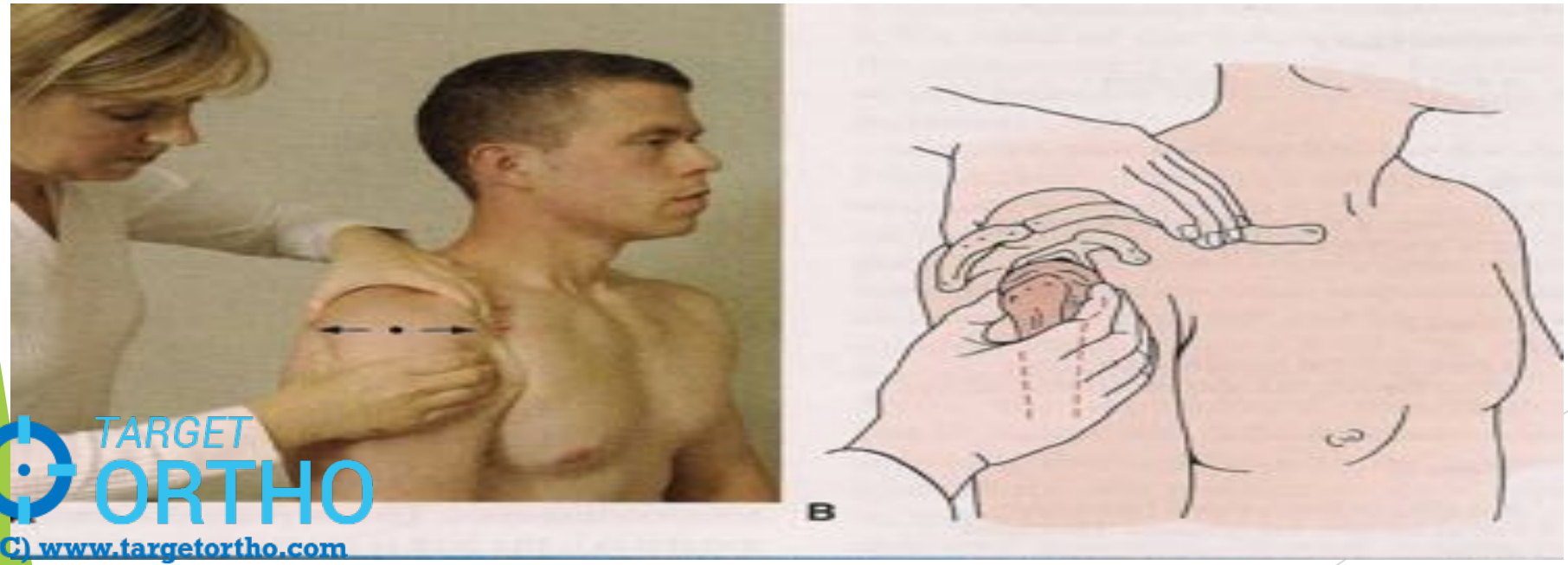
POSITIVE test: Marked apprehension with Pain when the arm is tested at 90˚. At 45˚ & 120˚, the patient shows some uneasiness & some pain; at 0˚ there is rarely apprehension.

Load and Shift Test

(SENSTIVITY- 90%, SPECIFICITY- 85%)

Patient sits with no back support and the examiner stabilized the shoulder with one hand and the other hand grasps the head of the humerus with the thumb over the posterior humeral head & the fingers over the ant. humeral head. The humerus is then gently pushed anteriorly or posteriorly.

GRADING

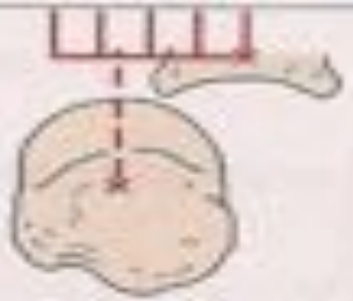


Normal Laxity

a mild amount of translation
(0-25%)

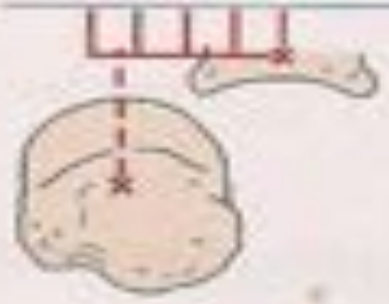
Grade I

a feeling of the humeral head riding upto the glenoid rim
(25-50%)



Grade II

a feeling of the humeral head over riding the rim, but spontaneously reduces
(>50%)



Grade III

a feeling of the humeral head over riding the rim, but remains dislocated
(50%)

Figure 5-46

Grades of anterior glenohumeral translation.

ANTERIOR DRAWER TEST [SHOULDER]

Supine. The examiner places the hand of the affected shoulder in the examiner's axilla, holding the patient's hand with the arm so that the patient remains relaxed. The shoulder to be tested is abducted bet. 80° & 120°, forward flexed up to 20°, and laterally rotated up to 30°.

The examiner then stabilizes the pt's scapula with the opposite hand, pushing the spine of the scapula forward with the index and middle fingers. The examiner's thumb exerts counterpressure on the pt's coracoid process. Using the arm that is holding the pt's hand, the examiner places his or her hand around the pt's relaxed upper arm & draws the humerus forward.

POSITIVE test: Anterior instability is decided depending on the amount of anterior translation.

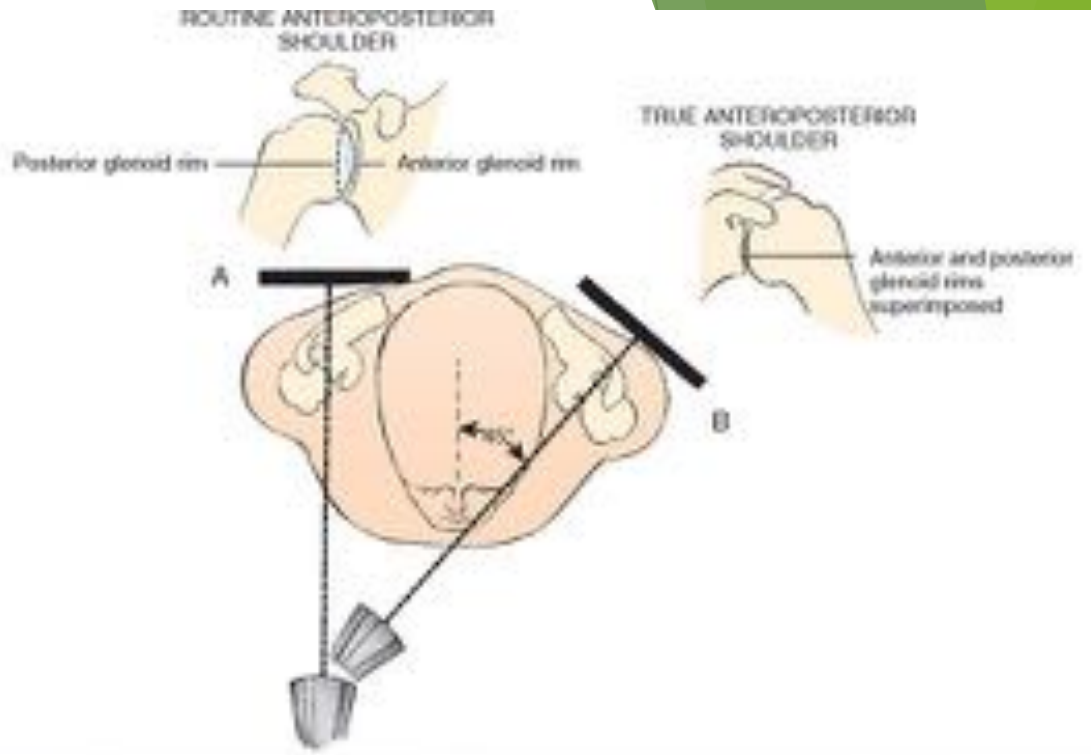
IMAGING

CT

MRI

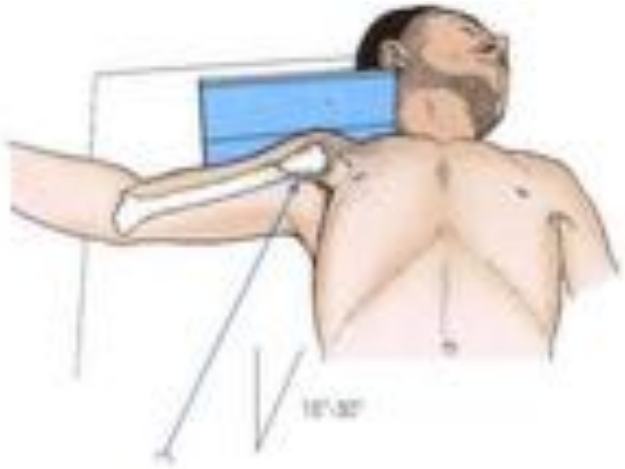
X rays

TRUE AP VIEW (GRASHEY VIEW): AP oblique view with arm in Internal rotation to prevent overlap of the humeral head with glenoid.

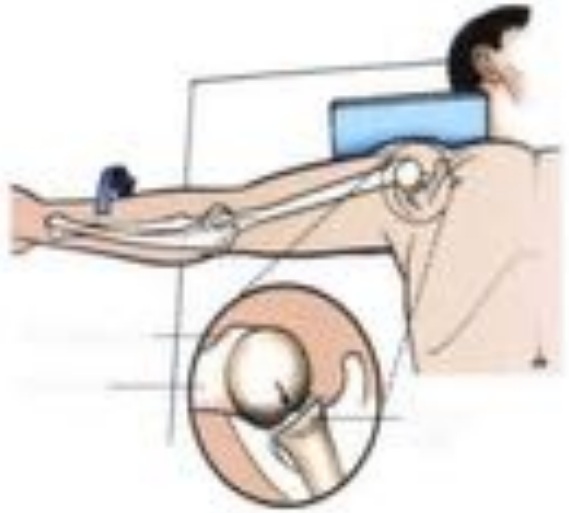


LATERAL PROJECTIONS: True lateral Axillary view; Velpeau Axillary view

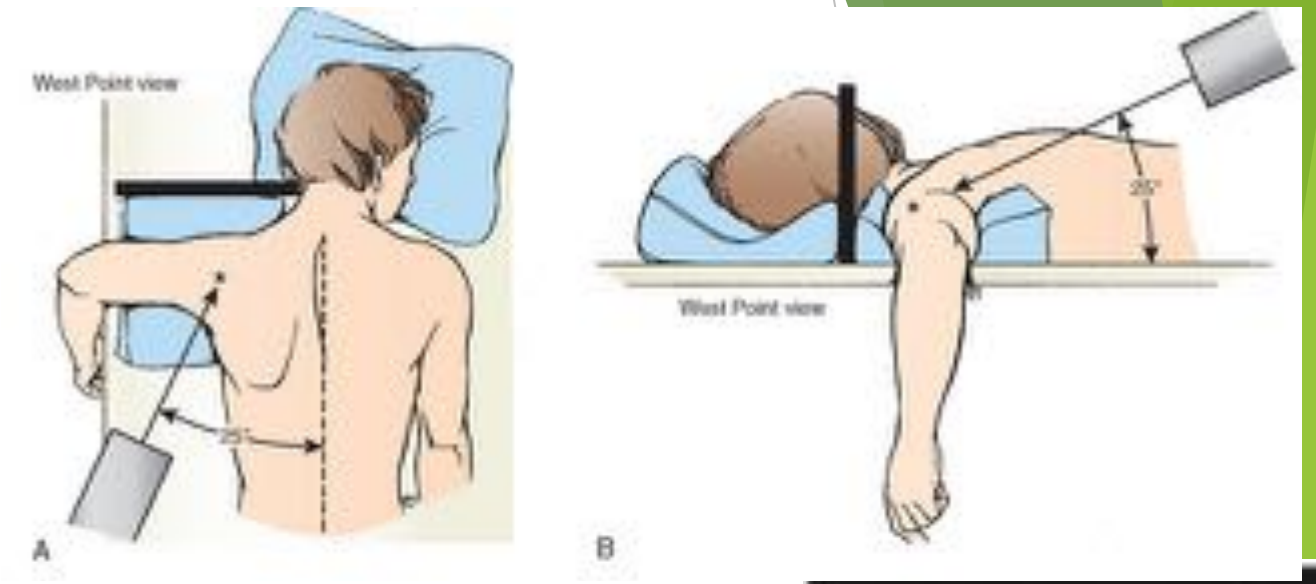
Inferosuperior axial shoulder joint: Lawrence method.



Inferosuperior axial shoulder joint: Rafert modification. Note the exaggerated external rotation of arm and thumb pointing downward. If present, a Hill-Sachs defect would show as a wedge-shaped depression on the posterior aspect of the articulating surface of the humeral head.*arrow*



WEST POINT AXILLARY VIEW: Helps in identification and even quantification of antero-inferior glenoid bone loss

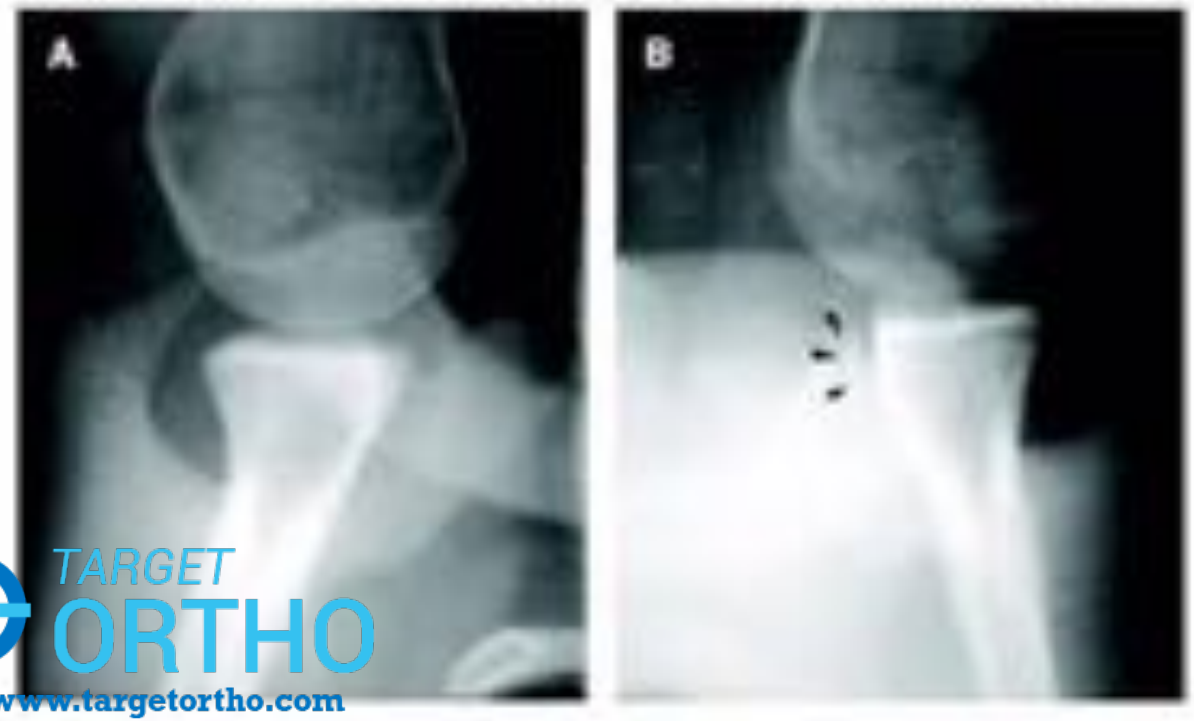


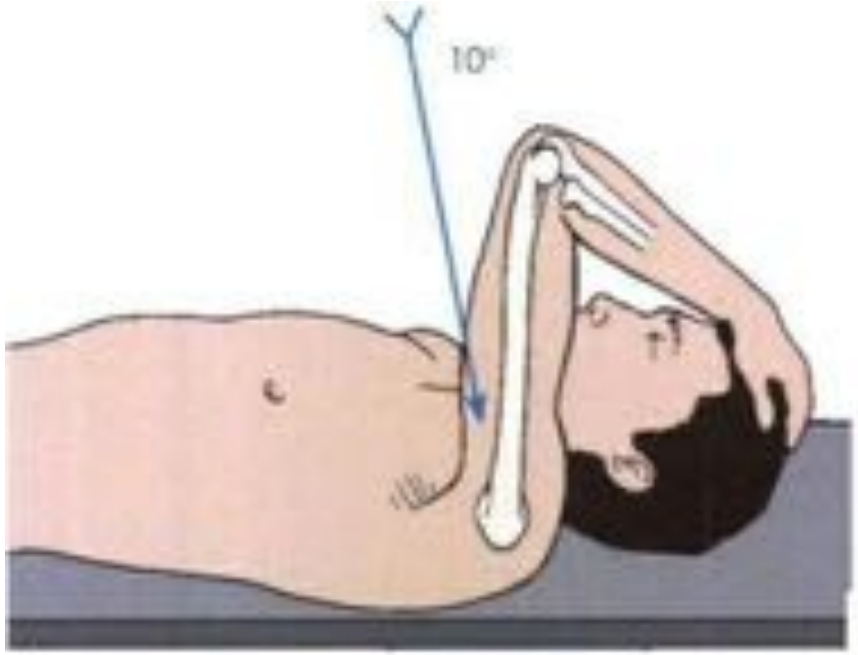
SCAPULAR Y VIEW (Tangential lateral X ray): Defines the direction of dislocation

BERNAGEAU VIEW: Shows exact anterior contour of the glenoid

Blunted angle sign: Rounding of the normal sharp triangular antero-inferior glenoid profile

Cliff Sign: Loss of contour of ‘triangle’ without a visible osseous fragment





EVALUATION CRITERIA

The following should be clearly demonstrated:

- Overlapping of coracoid process and clavicle
- Long axis of the humerus aligned with the long axis of the patient's body
- Bony trabeculation of the head of the humerus

AP axial humeral notch: Stryker notch method

Central ray

- Angled 10 degrees cephalad, entering the coracoid process.

Structures shown:

The resulting image will how the po - terosuperior and posterolateral areas of the humeral head.

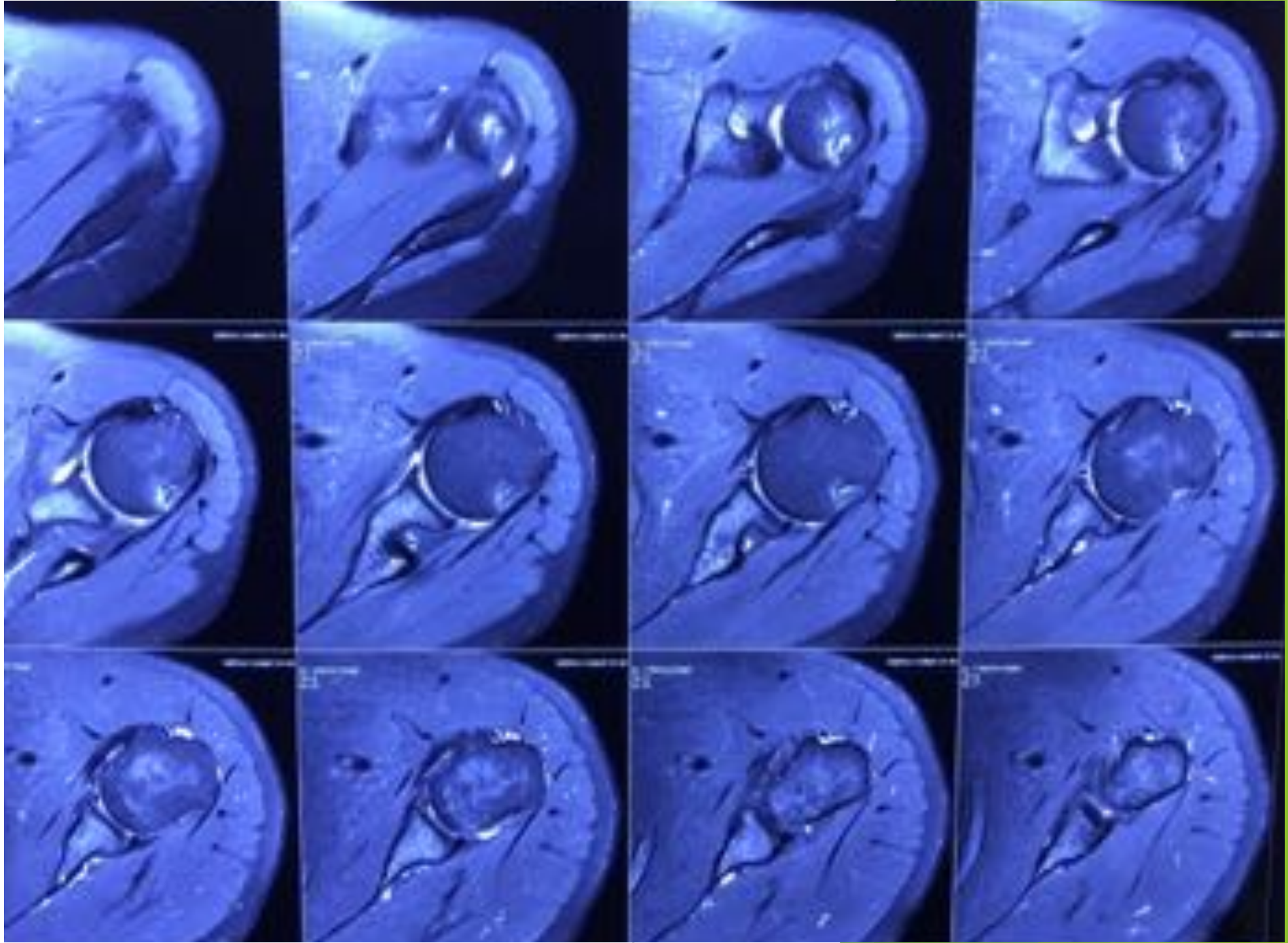
GARTH PROJECTION (Apical Oblique)

- **POSITIONING:**
  - The patient is positioned erect (either standing or sitting)with their back against a vertical Bucky
  - The patient is then rotated toward the affected side so they attain a 45 degree posterior oblique position.
  - The elbow is usually flexed with the patient's arm held across the chest.

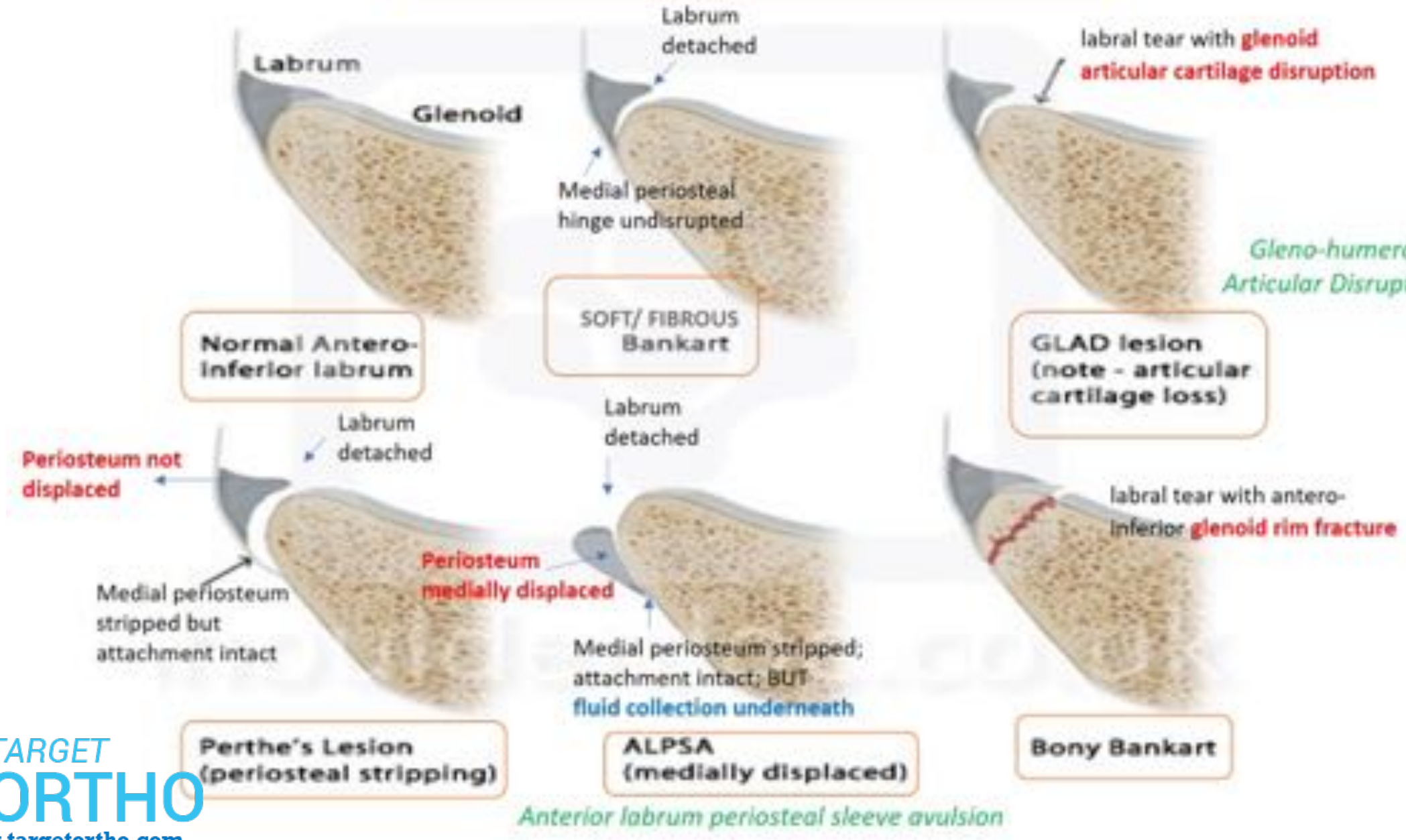
RADIOGRAPHY

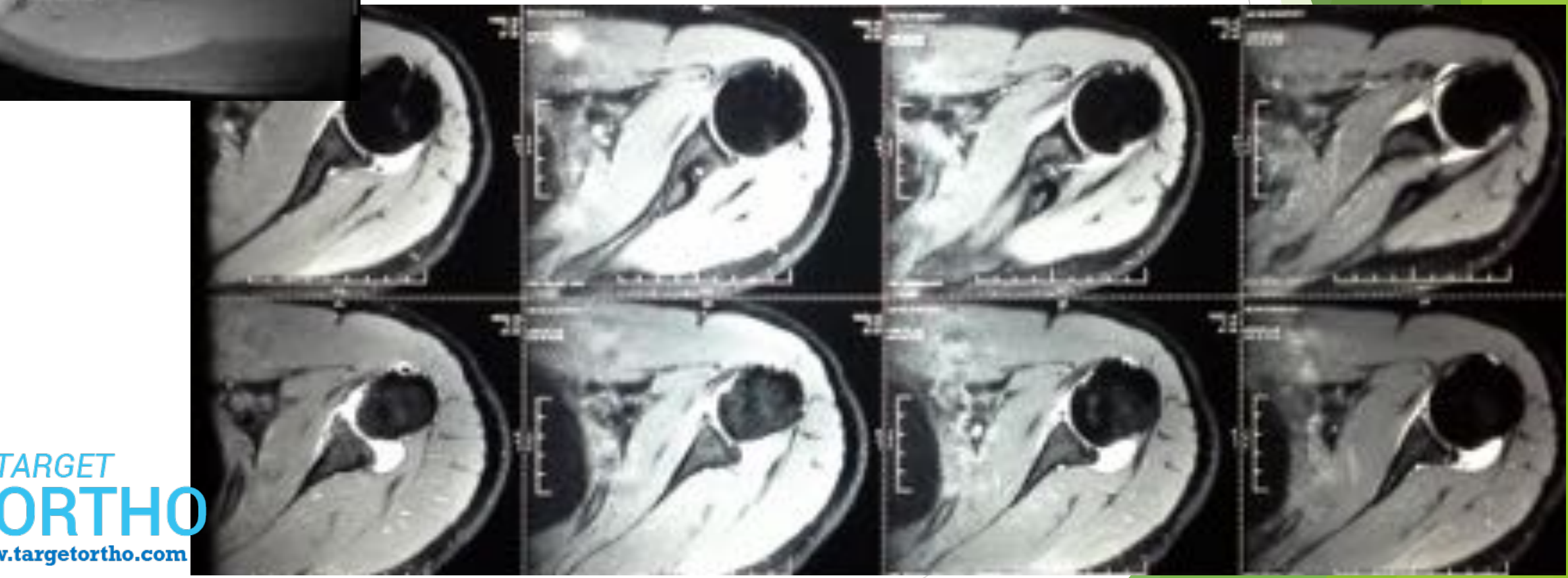
Specialized views	Position of patient	Used to assess	Demonstrates
Apical oblique [68, 69]	Supine. Involved arm is flexed at the elbow and hand is placed across the chest. Injured shoulder is placed in the 45° posterior oblique position. Central beam is angled 45° caudad	Shoulder injuries	Glenoid rim fractures, Hill-Sachs lesions, humeral head subluxation, soft tissue calcification
West Point view [68, 69]	Prone. Involved shoulder on a pad raised 8 cm from tabletop. Head and neck are turned away from involved side. The cassette is placed at superior aspect of shoulder. X-ray beam is centered on the axilla with 25° downward angulation from the horizontal and 25° medial angulation from the midline	Lesions of the anteroinferior glenoid rim	Soft tissue calcification adjacent to anterior or anteroinferior rim of the glenoid or fracture of the glenoid rim
Didiee view [68, 69]	Prone. The cassette is placed under the shoulder. Arm parallel to the table top with a 7.5-cm pad under the elbow. Dorsum of hand on the hip with the thumb directed upward. Beam angled 45° lateromedially and is aimed at the humeral head		Hill-Sachs lesion
Stryker Notch view [68, 69]	Supine. Involved shoulder is raised vertically and the palm is placed behind the head. The elbow points toward the ceiling and the humerus is perpendicular to the table. The cassette is placed on the tabletop, directly below the shoulder	Posterolateral portion of the humeral head	Compression in posterolateral portion of the humeral head (i.e., Hill-Sachs lesion)

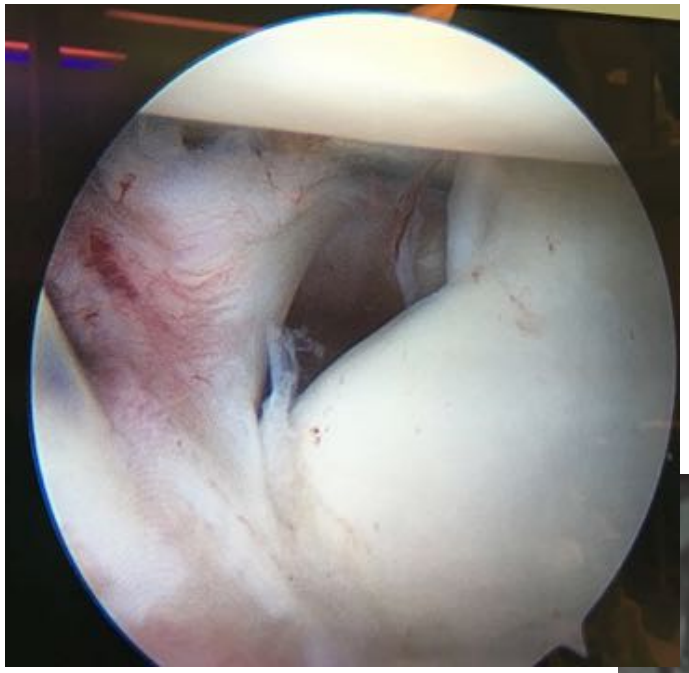
MRI

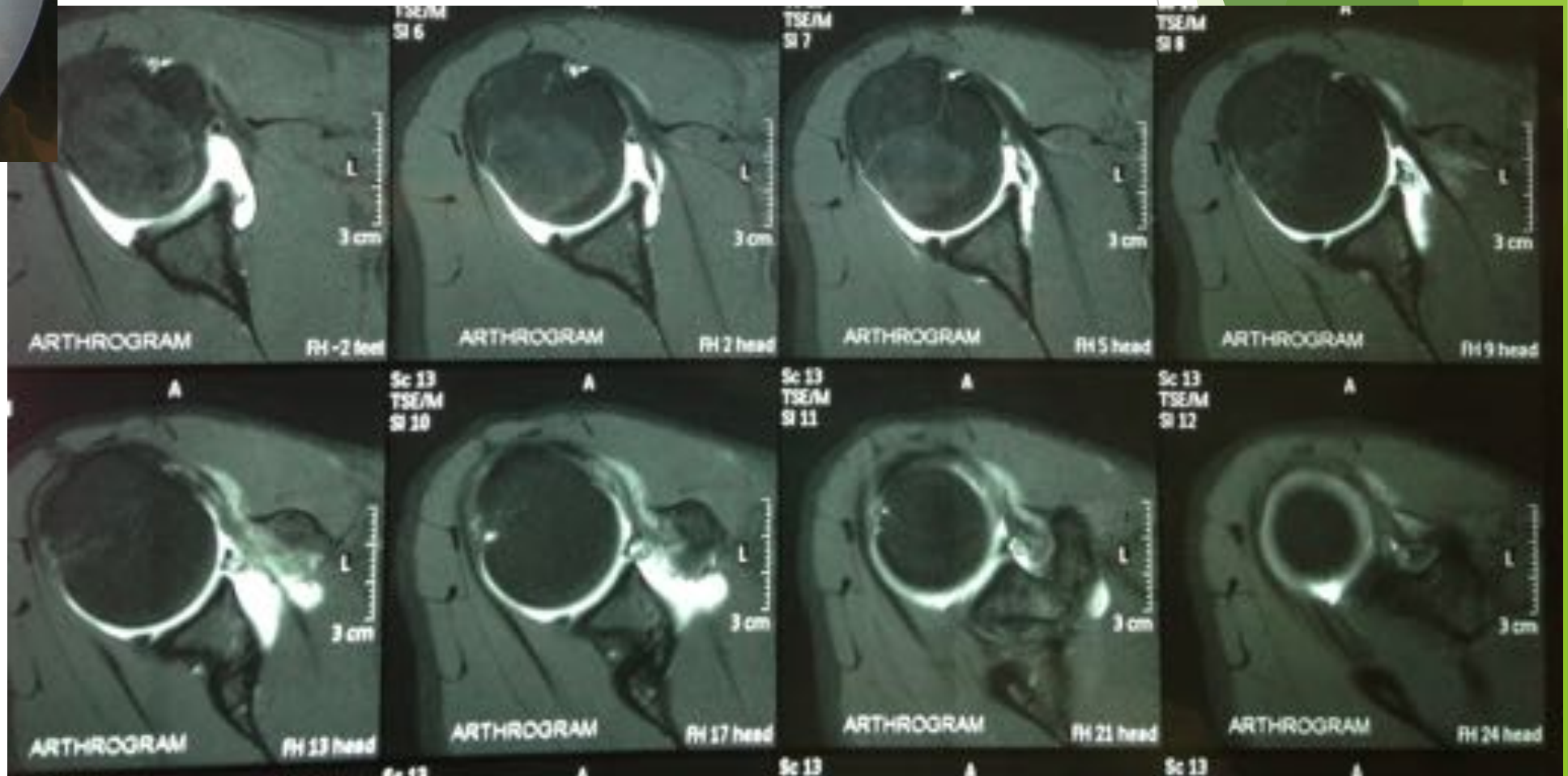


DIFFERENT VARIANTS OF LABRAL TEARS









HAGL

Humeral avulsion of Gleno humeral ligament

Nicola, 1942
Wolf et al, 1995

Bui-Mansfield

- Capsular avulsions off humerus (HAGL)
- Bony avulsions off humerus (BHAGL)
- Combination of Bankart and HAGL (Floating HAGL)
- Mid substance tear of GHL

HAGL first and then Bankart
(else overtightening of capsule)

Gadolinium enhanced

On sagittal MRI, axiallary pouch is "U" shaped. When HAGL is present, IGHL falls away from humerus and pouch becomes "J" shaped [J sign].

TREATMENT of ANTERIOR INSTABILITY

- Arthroscopic Bankart repair ± capsular plication
- Open Bankart repair ± capsular shift
- Open capsular shift
- Remplissage procedure

} Soft tissue procedures

- Latarjet procedure
- Bristow ‘s procedure

} Open/ Arthroscopic bony procedures

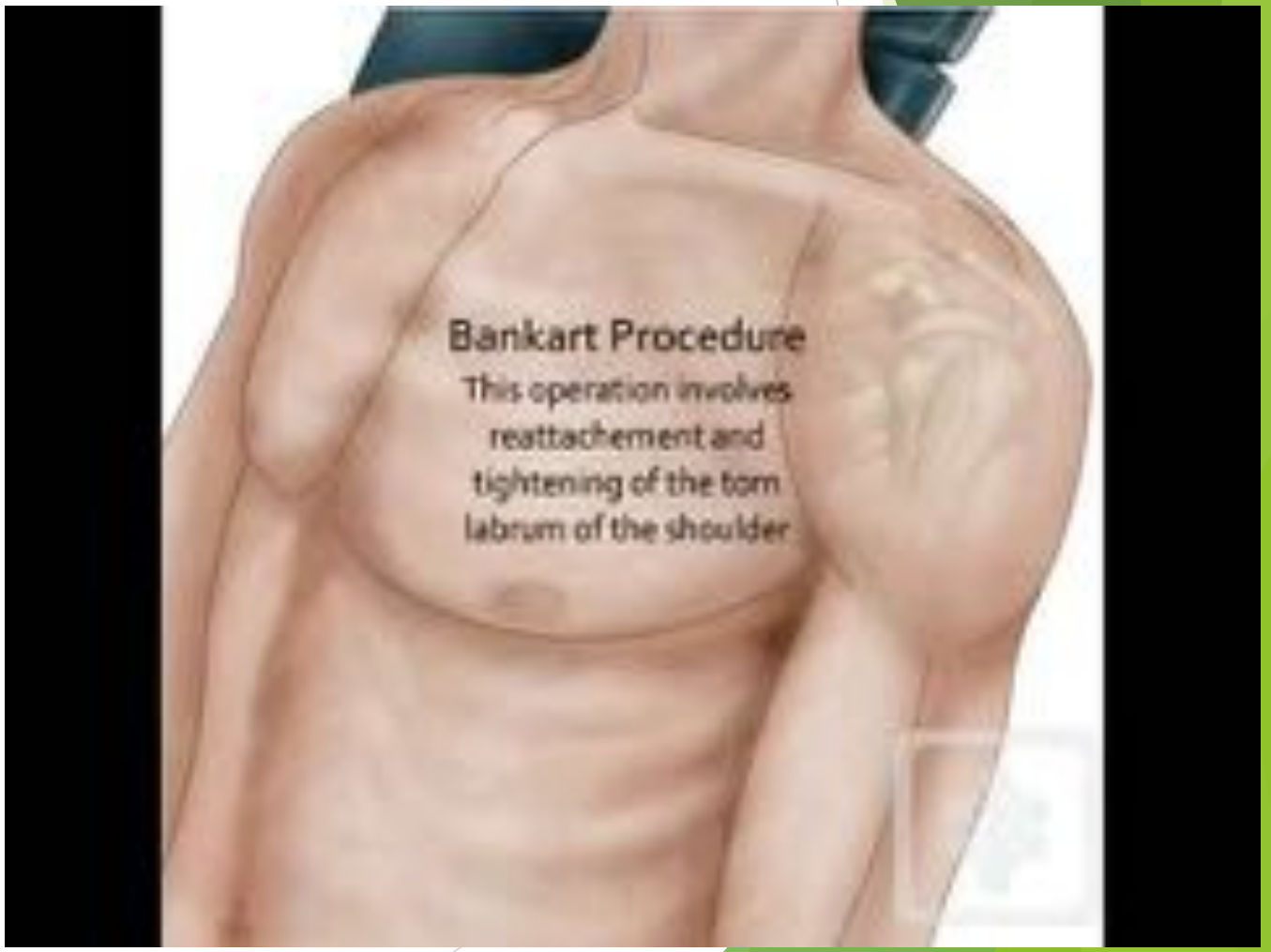
- Putti-platt & Magnuson Stack
- Boyd-Sisk

} Historic interest

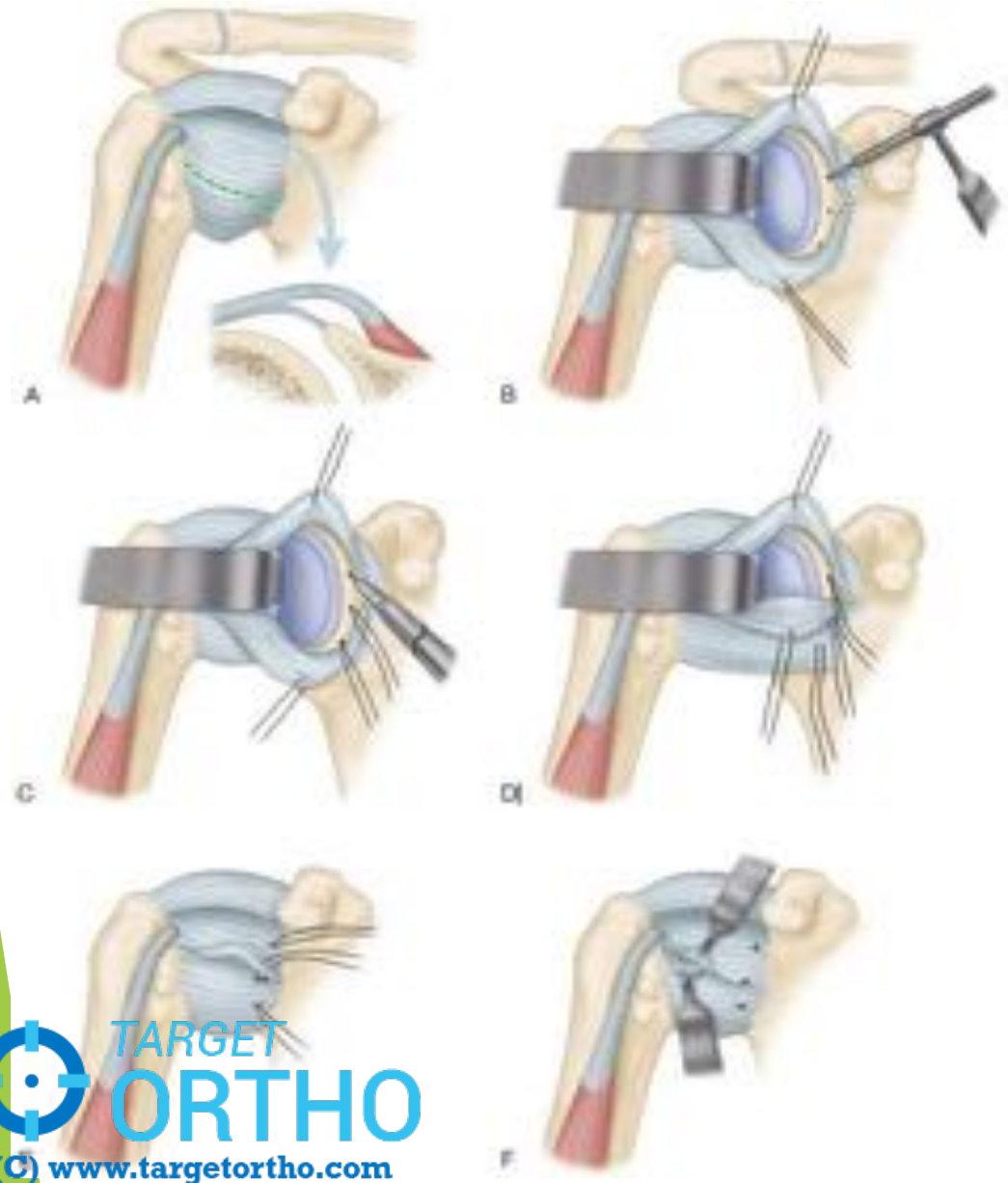
THE EVOLUTION

OPEN → ARTHROSCOPIC

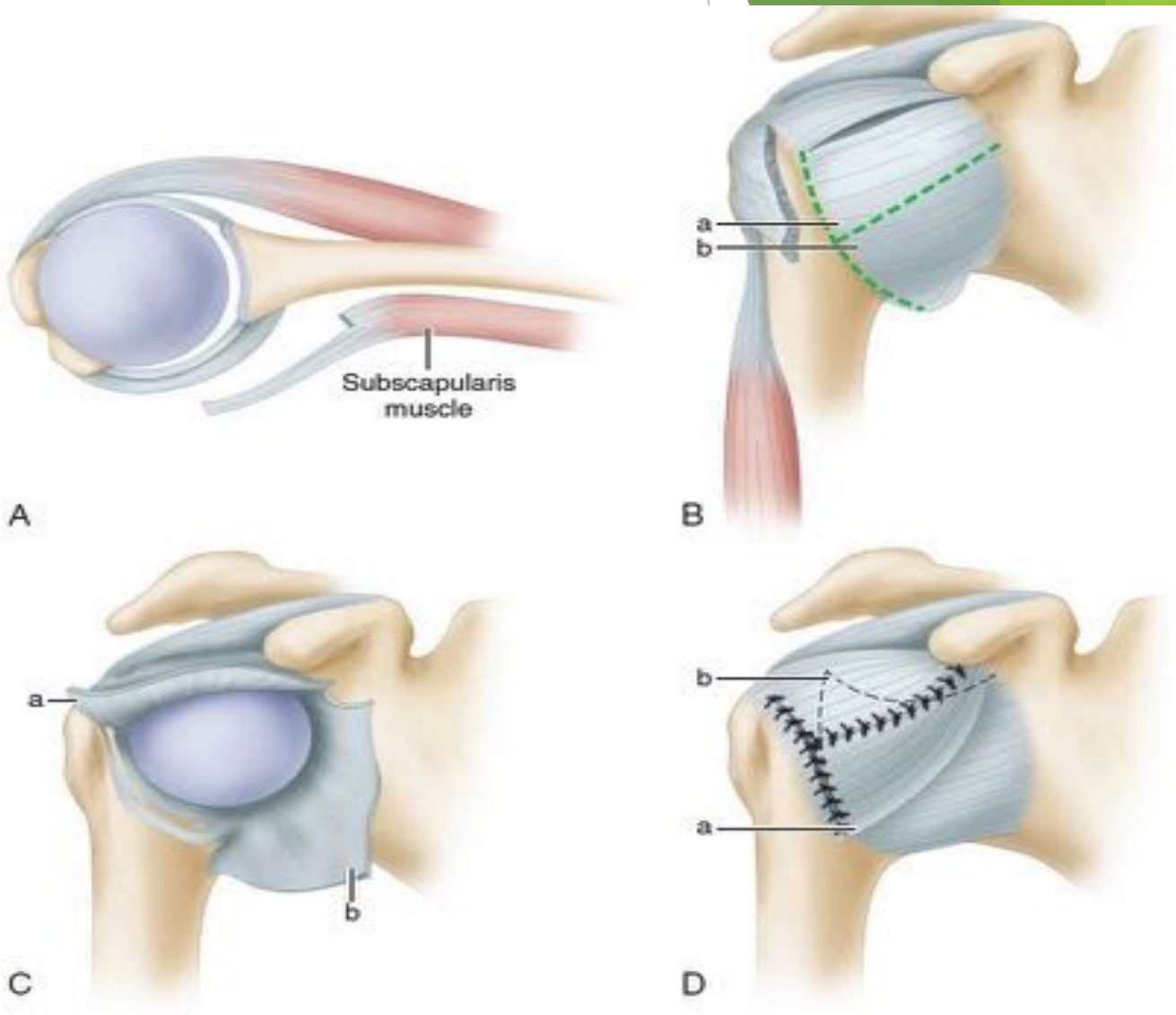
ANTERIOR INSTABILITY WITH NO SIGNIFICANT BONE LOSS



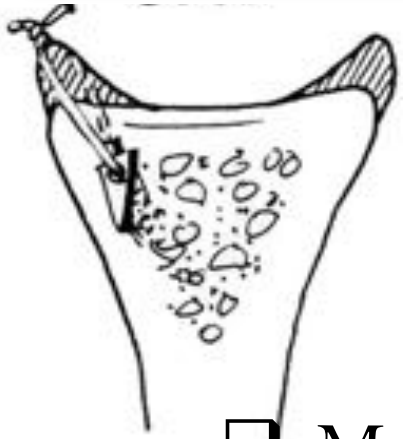
OPEN BANKART REPAIR [Original → Jobe's modification]



NEER's CAPSULAR SHIFT



Arthroscopic Bankart Repair



THE PRINCIPLES

- Mobilization of the labrum from glenoid neck
- Preparation of the bone bed
- Repair and re-tensioning of the labrum/ IGHL to create BUMPER EFFECT
- Superior shift of the inferior capsule

ARTHROSCOPIC BANKART REPAIR

BALANCED REPAIR Snyder

BALANCE THE POSTERIOR ASPECT OF SHOULDER IN ANTERIOR SHOULDER INSTABILITY

Plication sutures are used to attach posterior capsule to an intact posterior labrum by having the suture device exit at the chondro-labral junction

Posterior plication is done after Bankart repair if one feels the capsule is still patulous (mostly in cases with element of MDI) and head is not centred over the glenoid.

TARGET ORTHO