

Case Conference

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Patient ID

- 55 y/o female
- C.C.: recurrent right shoulder dislocation noted since falling down injury 2 years ago
- Came to ER because of dislocation for many times due to minor trauma
- Ask for help in OPD

Physical Examination

- Apprehension test (+)
- Sulcus sign (-)
- External and internal rotation weakness

Image examination

Treatment

- OP : arthroscopic examination and Latarjet procedure on 9/3

Glenohumeral Joint Instability

Key Factors in Surgery for Shoulder Instability

Shoulder Instability

- Anterior dislocation is by far the most common direction
- Could lead to instability of the glenohumeral joint
- The choice of open or arthroscopic repair has become controversial

Shoulder Stability

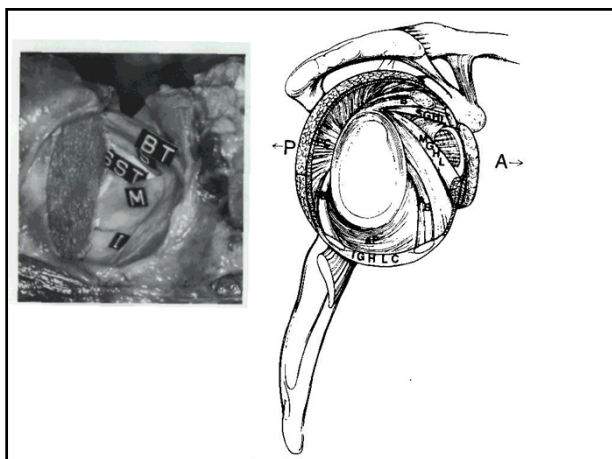
- Static stabilizers
 - Labrum
 - Glenoid articular surface
 - Negative intra-articular pressure
 - Capsuloligamentous structure
- Dynamic stabilizers
 - Rotator cuff muscles
 - Pectoralis major
 - Latissimus dorsi
 - Biceps
 - Periscapular musculature

Static stabilizers

- Labrum contributes 20% to GH stability
- Glenoid is deepened by 50% by the presence of the glenoid labrum
- The labrum increases the humeral contact to 75%

Glenohumeral Ligaments

- SGHL
 - Resists inf subluxation and contributes to stability in post and inf directions with arm in 0 deg abd
- MGHL
 - Limits ant excursion instability especially with arm in 45 deg abd position
 - limits ext rotation
- IGHL
 - 3 bands, anterior, axillary and posterior
 - IGHL complex acts like a sling
 - Primary restraint is at 45-90 deg abd.



- The humeral head will remain centered in the glenoid fossa if the glenoid and humeral joint surfaces are congruent and if the net humeral joint reaction force is directed within the effective glenoid arc.

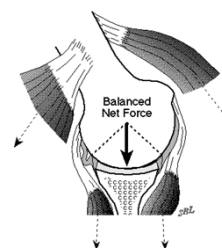


Figure 14-24

-The glenohumeral joint will not dislocate as long as the net humeral joint reaction force is directed within the effective glenoid arc.



The maximal angle that the net humeral joint reaction force can make with the glenoid center line in a given direction is the balance stability angle

Selecting The Patient History

- Source and Type of instability
 - Hand dominance
 - Type of instability
 - Direction
 - Age at first episode
 - Activity level
 - Any earlier treatment
 - Severity

Selecting The Patient Physical Examination

- ROM
 - Passive
 - Active
- Muscle Strength
- Sign of rotator cuff tear
- Laxity test

Selecting The Patient Physical Examination

- Apprehension test
 - Stress IGHL and anterior capsule
- Sulcus sign
 - Stress rotator interval, coracohumeral ligament, and the superior glenohumeral ligament
- Load-and-shift test

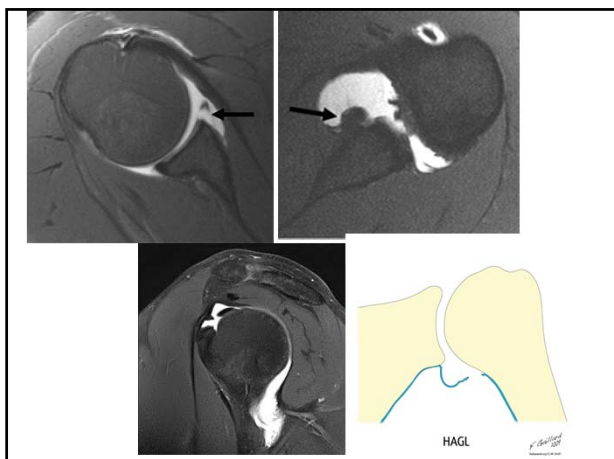
Range of abduction	Structure tested
0 - 60°	Superior GHL/ Coracohumeral lig. / rotator interval
60 - 90°	Middle GHL
90° +	inferior GHL

Selecting The Patient Radiographic Evaluation

- X-ray
- CT : for bony injury
- MRI : soft tissue evaluation

Selecting The Patient Soft-Tissue Lesion

- IGHL is the primary restraint to ant.inf. Instability
- Bankart Lesion: detachment of the anterior labrum, MGHL and IGHL --> essential lesion?
- ALPSA Lesion: lesion extends into the medial glenoid neck, increased risk of recurrence after repair
- HAGL lesion: lesion caused humeral avulsion, open repair may be preferable



Selecting The Patient Bone Loss Evaluation

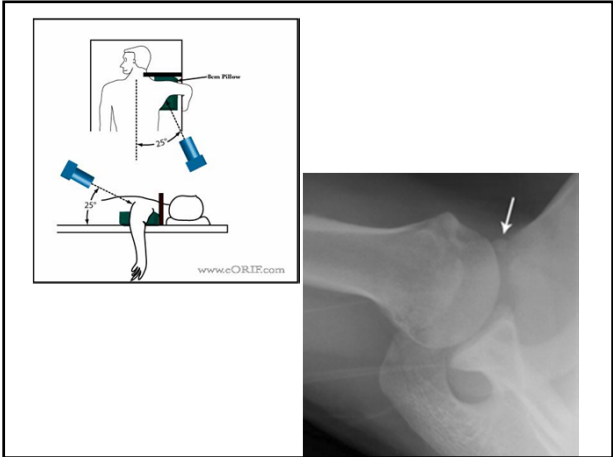
History

- Initial dislocation by high energy trauma
- Multiple events
- Recurrent instability extending over years
- Single event several years after 1st episode
- Progressive ease of instability
- Instability in the mid ROM
 - 45~60 abduction, 45 ER

Image

Glenoid Bone Deficiency

- West point and apical oblique view
- Best evaluated best through 3D- CT
- Most lateral cut of sagittal view of glenoid
- Bone loss usually occurs along a line parallel to the long axis of glenoid



Glenoid Bone Deficiency

distance from the bare spot to the posterior rim
– distance from the bare spot to the anterior rim

$$\text{percent bone loss} = \frac{2 \times \text{distance from the bare spot to the posterior rim}}{\text{distance from the bare spot to the anterior rim}}$$

Glenoid Bone Deficiency

- % of bone loss <-> Recurrent dislocation ?
- The stability is adversely affected by bone loss of 21% or more

The effect of a glenoid defect on anteroinferior stability of the shoulder after Bankart repair: a cadaveric study. Itoi E, etc. JBIS A. 82(1):35-46, 2000 Jan

- Even 6 to 8 mm of anterior glenoid bone loss may require bony augmentation

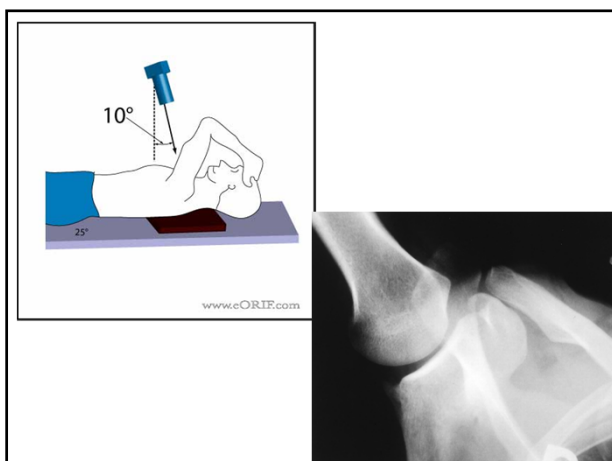
Glenohumeral articular contact areas and pressures following labral and osseous injury to the anteroinferior quadrant of the glenoid. Greis, etc. Journal of Shoulder & Elbow Surgery. 11(5):442-51, 2002 Sep-Oct.

Humeral Bone Deficiency

- Hill-Sachs lesion: 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 abduction and external rotation
- More easily engaged if anterior glenoid bone deficiency exists

Humeral Bone Deficiency

- Evaluated in Stryker Notch View
- How large the lesion is clinically significant?
- A Hill-Sachs lesion may be present in 80% of patients with recurrent dislocation, but most injuries can be safely ignored
- Preferred treatment is less well defined



Selecting the Procedure

- Soft tissue procedure should be chosen if primary defect involves labrum and capsule
- Arthroscopic anterior stabilization using the most effective techniques (suture-anchor) has a similar rate of failure to open stabilization after 2 years
- A high failure rate in athletes is related to the presence of bony defects
- Identify the pathology and fix the lesion no matter the approach

Selecting the Procedure

- Consider bony procedure if significant bony defect of glenoid and humerus presents
- Glenoid bone loss > 20% : traditional threshold for soft tissue procedure

Selecting the Procedure

- Hill-Sachs Lesion
 - 20~30%:
 - Acute: disimpaction and bone grafting
 - Chronic: Remplissage, transfer of infraspinatus tendon
 - 30% to 40%: treated with fresh frozen allograft
 - > 45%: consider prosthetic replacement

The instability severity index score: A SIMPLE PRE-OPERATIVE SCORE TO SELECT PATIENTS FOR ARTHROSCOPIC OR OPEN SHOULDER STABILISATION

F Balg, etc. JBJS B. : Nov 2007. Vol. 89, Iss. 11; pg. 1470, 8 pgs

Table IV. Instability severity index score is based on a pre-operative questionnaire, clinical examination, and radiographs

Prognostic factors	Points
Age at surgery (yrs)	
< 20	2
> 20	0
Degree of sport participation (pre-operative)	
Competitive	2
Recreational or none	0
Type of sport (pre-operative)	
Contact or forced overhead	1
Other	0
Shoulder hyperlaxity	
Shoulder hyperlaxity (anterior or inferior)	1
Normal laxity	0
Hill-Sachs on AP* radiograph	
Visible in external rotation	2
Not visible in external rotation	0
Glenoid loss of contour on AP radiograph	
Loss of contour	2
No lesion	0
Total (points)	10

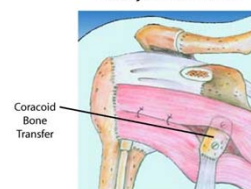
Total score	Recurrence rate (P< .001)	Preferred Tx
0~3	4.8%	Soft-tissue stabilization
3~6	9.9%	Latarjet procedure
>6	70%	Latarjet procedure

* AP, anteroposterior

Latarjet Procedure

- Coracoid bone grafted to the anterior glenoid with conjoined tendon attached
- Placement through a split in subscapularis

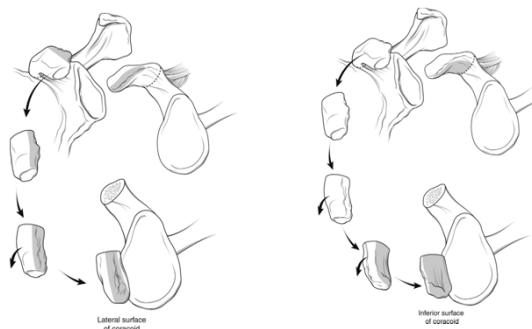
Latarjet Procedure



Latarjet Procedure

- Stabilizing mechanism
 - Extension of glenoid arc
 - Sling effect of conjoined tendon
 - Tensioning of lower subscapularis

Latarjet Procedure



Latarjet Procedure

- Can adequately treat glenoid or humeral bone loss
- Can be effective to stabilize a capsular deficiency

- Thanks for your attention!