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Title:

**Neglected Unreduced Anterior Shoulder Dislocation:
How far shoulder function can be recovered?**

by

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Neglected unreduced anterior shoulder dislocation: how far shoulder function can be recovered?

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Abstract

Neglected unreduced anterior shoulder dislocation is a challenging orthopaedic problem in Indonesia. Looking at demographics, many patients are looking for traditional medicine for treating this kind of disease. The results are certainly not satisfactory when the humeral head is still outside the glenoid. Surgery carried out by performing the anterior capsulolabral reconstruction. The purpose of this study is to report the results of shoulder function in ten patients with neglected unreduced anterior shoulder dislocation after open reduction. Ten patients with neglected unreduced anterior shoulder dislocation underwent open reduction and capsulolabral reconstruction after an average delay of 12 weeks from injury. Early motion was allowed two days after surgery in the safe position and the clinical and radiographic results were analyzed at an average follow-up of two years. The average Rowe's score was 74 points. Two shoulders were excellent, six shoulders as good and two as fair (Rowe's system). All patients were able to perform their daily activities and they had either mild or no pain. Anterior active forward flexion loss averaged 30 degrees, external active rotation loss averaged 20 degrees and internal rotation loss averaged buttock levels. Mild degenerative joint alterations were noted in two patients. It may be concluded that open reduction with anterior capsulolabral repair offers a moderate functional result.

Keywords: Neglected unreduced anterior shoulder dislocation; Traditional medicine; Capsulolabral reconstruction; Rowe's system

Introduction

Shoulder dislocation is a condition of the shoulder in displacement of the ball of the shoulder joint from the socket of the joint (the glenoid fossa of the humerus, or scapula). Most common are due to trauma. More than 90% are anterior dislocation, and less than 30% posterior dislocation. 85% associated with Bankart lesion.¹

Anterior dislocation generally results from forced external rotation or extension in an abducted and externally rotated arm. Posterior dislocations: associated with epileptic seizures, high-energy trauma, electrocution, or electroconvulsive therapy. Seizure may be associated with hypoglycemia (diabetes) or drug withdrawal.²

Incidence 1.68/1000 person years in US military; 0.08/1000 person per years in genera; US population.³ Gender distribution is bimodal, with peak incidence in men aged 20-30 years (with a male-to-female ratio of 9:1) and in women aged 61-80 years (with a female-to-male ratio of 3:1). Shoulder dislocation occurs more frequently in adolescents than in younger children because the weaker epiphyseal growth plates in children tend to fracture before dislocation.

Glenohumeral joint anatomy

Modified “ball and socket” joint large spherical humeral head small shallow glenoid cavity. Labrum around edge of saucer, “suction cup” to increase stability. Shallow cup deepened by labrum 25% humeral head surface in contact with glenoid. Shoulder joint has greatest range of motion and all stability relies on the soft tissue surround it. The glenohumeral (GH) joint is normally bathed in a small amount (less than 1 mL) of free synovial fluid.⁴

Under normal conditions, the intra-articular pressure is negative, which creates a relative vacuum that resists bony translation. The humeral head can dislocate anteriorly, posteriorly or inferiorly in relation to the glenoid fossa. GH joint stability is dependent on static (labrum, GH capsular ligament) and dynamic (rotator cuff, deltoid, biceps, scapular musculature) restraints. Rotator cuff function as a dynamic stabilizer, passive muscle tension, ligament tightening and compression of articular surface. Inferior glenohumeral ligament consists of anterior inferior GH ligament. Axillary pouch and posterior inferior GH ligament is the most important for resisting anterior translation on the abducted arm.

Most shoulder dislocations are anterior. Patients usually hold the affected arm in abduction and external rotation. The humeral head usually is palpable anteriorly, and the diagnosis is often confirmed by locating a dimple in the skin beneath the acromion. Cartilage ring covered around the glenoid. Deepens the socket of the GH joint (Fig.1). Capsuloligamentous anatomy viewed from the side with the anterior

aspect to the right and the posterior aspect to the left. The anatomy and histology of inferior glenohumeral ligament.⁵

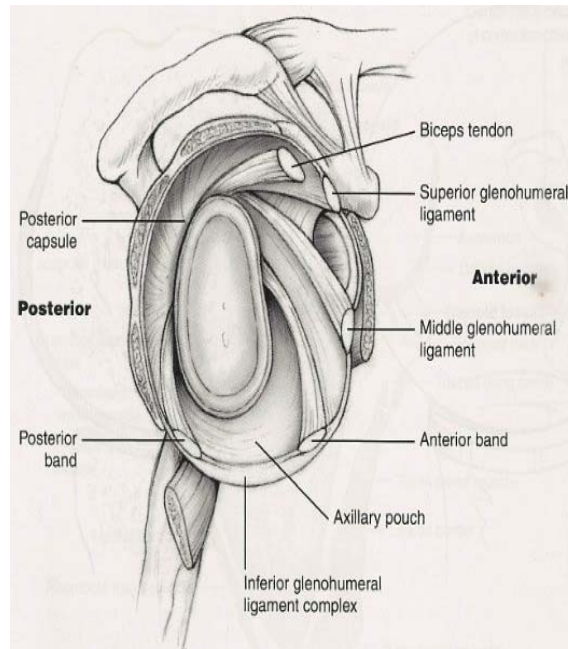


Figure 1. Internal view of the glenohumeral joint.⁵

Shoulder dislocation clinical evaluation

In anterior shoulder dislocation there is prominence of the humeral head anterior, medial and inferior to the shoulder joint with a hollow region beneath the lateral deltoid, loss of normal deltoid contour with prominent anterior acromion. Characteristically the arm is held in an abducted, slight external rotated position. In contrary, in posterior dislocations showed prominence of humeral head posteriorly with prominent coracoid process anteriorly, therefore, arm is held in an internally rotated, adducted position. Inferior dislocation, arm is generally locked in an overhead position and horizontally abducted. Humeral head may compress the axillary nerve. Complete neurovascular examination includes brachial, radial and ulnar pulses should be done.

Traumatic

- Single force applies excessive overload to the soft tissues of the joint and often damages the glenoidlabrum (Bankart lesion) and the joint capsule.

Atraumatic

- Athlete who has multiple joint laxities and frequent episodes of sub-luxation before and a relatively minor one results in dislocation. (Noted as a congenital hypermobility and/or muscle weakness).

Acquired

- Sports such as swimming, gymnastics and baseball where repetitive micro-trauma, poor stretching and motion lead to capsular stretching. Eventual feeling of instability.

Types of dislocation

Anterior dislocation

Arm in abduction and external rotation. Force is taken on the hand or arm increases the external rotation of the arm causing the head of the humerus to dislocate.

Inferior dislocation /subcoracoid dislocation

Arm is in excessive abduction and a force is taken on the hand pushing the head of the humerus inferiorly out of the glenoid.

Posterior dislocation

Posterior shoulder dislocations make up a small minority of total shoulder dislocation cases, accounting for 2-4% of presentations. However because of a low level of clinical suspicion and insufficient imaging, they are often missed. Approximately half of posterior shoulder dislocation is undiagnosed on initial presentation.

Traditionally posterior dislocations have been associated with epileptic seizures, high-energy trauma, and electroconvulsive therapy (ECT), although the incidence associated with ECT especially has decreased somewhat in recent years.

The injury is almost always due to a fall onto an outstretched, internally rotated arm. The force of the impact pushes the head of the humerus posteriorly out of the glenoid cavity. Often an osteochondral impression fracture (Hill-Sachs lesion) is produced on the anterior aspect of the humeral head as it impacts on the posterior lip of the glenoid. If enlocation is delayed, it can worsen the severity of this lesion and lead to

further complication. Dislocation may also result in capsulolabral tears, glenoid rim fractures or the rotator cuff tears.

Pathological changes

Bankart lesion is a dislocation causes stripping of the glenoid labrum along with the periosteum from the anterior surface of the glenoid and scapular neck. The head thus comes to lie in front of the scapular neck, in the pouch thereby created.

- Bankart lesion may cause recurrent or habitual dislocation of the shoulder joint.⁶
- Hill-Sachs lesion, this is a depression on the humeral head in its posterolateral quadrant, caused by the anterior edge of the glenoid on the head as it dislocates.
- Roundening off of the anterior glenoid rim occurs as the head dislocates over it.
- There may be associated fractures of greater tuberosity of the humerus or of rim of the glenoid.

Shoulder dislocation diagnostic tests

The diagnosis of glenohumeral dislocation is confirmed with at least two radiographic views of the affected shoulder. X-rays, using “ shoulder trauma series ” which consisted of plain anteroposterior (AP), lateral in the scapular plane, and axillary views usually reveal an anterior dislocation but can miss a posterior dislocation. Hill-Sachs lesion is also demonstrated on plain AP radiograph in internal rotation, and closely evaluate for concomitant surgical neck or other fracture. An axillary or a Y-view provides a more accurate picture of the AP position of the humeral head relative to the glenoid fossa. If the diagnosis is still unclear after plain films have been obtained, a computed tomographic (CT) scan should be considered. Care should be taken to look for an avulsion fracture of the glenoid (Bankart lesion). This injury usually requires surgical repair. MRI indicated to evaluate for Bankart Lesion in young athletic patients and RCT tears in older patients.

CT scan is best to evaluate bony anatomy and should be considered for the recurrent dislocation suspected of having a large Hill-Sachs or bony Bankart lesion.

Patients and Methods

Herewith the author would like to illustrate cases in ten patients with neglected unreduced anterior shoulder dislocation underwent open reduction and capsulolabral reconstruction after an average delay of twelve weeks from injury. Dislocations were diagnosed on AP radiographs.

Early motion was allowed two days after surgery in the safe position and the clinical and radiographic results were analyzed at an average follow-up of one to two year. There were three cases had also greater tuberosity fracture. Surgery was performed with the patient in beach chair position. Anterior approach to the shoulder through deltopectoral interval was performed. Subscapularis tendon and capsule were cut in one layer and reduction was achieved with lateral traction and internal rotation. After reduction the capsulolabral complex was reinserted on to the anterior glenoid rim in all cases. Transglenoid suture with Ethibon no.2 was used for repair. Subscapularis tendon was repaired in neutral position. No joint temporary fixation procedure was used following operative reduction. Strong repair of the anterior capsule at 12 o'clock position, subscapularis and Bankart lesion provided enough stability for postoperative rehabilitation. In concomitant injury like fracture of greater tuberosity, tension band wiring (TBW) was used to fix it.

The upper limb was secured postoperatively according to Rowe and Zarin's scoring systems. This scoring system evaluates stability, motion and shoulder function.⁷

In follow-up, the arms were kept anterior to the coronal plane of the body by means of sling and swath. The supports were loosened three times a day to allow early shoulder motion up to 90 degrees of flexion and 0 degree of external rotation and full elbow motion. After 3 weeks, flexion and external rotation were gradually increased and with gradual stretching and improving subscapularis contracture we gained more external rotation. Internal rotation was begun at third weeks postoperatively.



Figure 2. Left shoulder ROM, 5 week old unreduced anterior shoulder dislocation in a 30-year-old male and forward flexion after one year.

Most authors recommended allograft reconstruction or arthroplasty such as Gavrilidis revealed good results for 12 patients, durations of dislocation was 14 months in 13 patients with locked chronic dislocation.⁸ Dicklic reported good results with allograft reconstruction. In this series Hill-Sach's lesion was less than 40%, suppose that the reason is the mean duration of dislocation (12 weeks) was less than that of the mention reports.⁹

Interpreting the Rowe score for instability in this series. It reveals the average Rowe's Score was 74 points, which consisted of excellent result in 2 shoulder, good: result in 6 shoulder and fair in 2 shoulder. Anterior forward-flexion loss of average 30°; External rotation loss average 21°. Mild degeneration joint alteration was noted in two patients. Literature said that the incidence of osteonecrosis is rare, and generally associated with fracture-dislocations. In this situation, best treated with observation in adolescents.¹⁰

All patients were able to do their daily activities with mild or no pain. CT scan showed anterior subluxation in one patient. One of these cases had contracture of the cuff

tendons involving one third of the joint surface, and superior migration of the humeral head and fair result in Rowe system. She was reluctant to move the joint, but these two patients were able to perform daily activities with mild pain. Mild degenerative changes presented in one patient at final radiographs.

Most reports have recommended shoulder joint transfixation to prevent redislocation following open reduction. Wilson and Mckeever recommended acromiohumeral crossed transfixing pins to prevent recurrence of the dislocation¹¹. Rockwood and Green also suggested using smooth pins through the head into the glenoid for ten to fourteen days.¹² According to our study the results after capsulolabral complex repair appears to be more favorable than previously reported studies which have used metallic fixation methods. Postacchini, et al reported good results in all four cases of operatively reduced chronic anterior and posterior dislocation.¹³ Goga have reported three excellent, five good and two fair results in ten operatively reduced anterior shoulder dislocation¹⁴ Acromiohumeral Kirschner-wire fixation was used for 4 weeks in that group and the results were evaluated according to Rowe and Zarin's system. After reduction patients are generally immobilized for 4-6 weeks in a sling. Consider immobilization in adduction and external rotation. Immobilization in 30 of external rotation has shown a decreased recurrence rate.^{15,16}

It may be concluded that in neglected cases, open reduction with anterior capsulolabral repair offers a moderate functional result.

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