



PANORAMIC REVIEW OF MANAGEMENT, CONSERVATIVE TREATMENT AND SHOULDER REDUCTION TECHNIQUES

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ABSTRACT

Introduction: The glenohumeral joint combines a wide range of motion and insufficient bony stabilization, making it susceptible to instability and dislocations. Glenohumeral dislocations are commonly attributed to contact sports, as well as bicycle accidents, falls and high impact trauma.

Objective: to detail current information related to the incidence, clinical evaluation, imaging assessment, management, conservative treatment and shoulder reduction techniques of shoulder dislocations.

Methodology: a total of 30 articles were analyzed in this review, including review and original articles, as well as clinical cases, of which 16 bibliographies were used because the other articles were not relevant for this study. The sources of information were PubMed, Google Scholar and Cochrane; the terms used to search for information in Spanish, Portuguese and English were: shoulder dislocation, glenohumeral dislocation, shoulder reduction maneuvers, shoulder reduction techniques.

Results: The shoulder joint is frequently correlated to dislocations, showing up to 45% of all dislocations. Inferior as well as superior dislocations are rare. Chronic glenohumeral dislocations are infrequent injuries accounting for less than 2%. Anterior glenohumeral dislocations account for about 90% of shoulder dislocations. Approximately 50% to 79% of posterior glenohumeral dislocations are overlooked.

Conclusions: As the epidemiology indicates, there is a high incidence of shoulder dislocations, so it is important to recognize the importance of adequate clinical assessment, diagnosis and knowledge of reduction maneuvers for the management of glenohumeral dislocations. There are several types of maneuvers that can be used for reduction of a dislocated shoulder, these maneuvers can be chosen according to the case of the affected individual, in addition to the preference and experience of the person who is going to perform the reduction maneuver. Imaging tests play an important role both at diagnosis and post-reduction to confirm reduction.

KEY WORDS: shoulder, dislocation, techniques, reduction, conservative.



INTRODUCTION

The glenohumeral joint combines a wide range of motion and insufficient bony stabilization, making it susceptible to instability and dislocations. Glenohumeral dislocations are commonly attributed to contact sports, as well as bicycle accidents, falls, and high-impact trauma. The shoulder joint is frequently correlated with dislocations, accounting for up to 45% of all dislocations. The shoulder joint is the most frequently dislocated joint in the body. Shoulder dislocations are usually anterior. The incidence of glenohumeral dislocation is approximately 17 cases per 100,000 inhabitants per year, being most frequent between 21 and 30 years of age in men and between 61 and 80 years of age in women. Inferior dislocations as well as superior dislocations are rare. Chronic glenohumeral dislocations are infrequent injuries, accounting for less than 2% of all shoulder dislocations. Clinically, most commonly, affected individuals hold the affected arm with the contralateral hand, as well as present with pain on movement and reduced range of motion. Knowledge of the reduction maneuvers or techniques that should be performed in each type of dislocation is of vital importance. There are several reduction maneuvers described over time, in this article we will describe several of them. Reduction maneuvers sometimes require intra-articular lidocaine or intravenous analgesia and sometimes sedation. Conservative treatment usually includes pain management, short-term use of a sling and physiotherapy(1-5).

METHODOLOGY

A total of 30 articles were analyzed in this review, including review and original articles, as well as cases and clinical trials, of which 16 bibliographies were used because the information collected was not important enough to be included in this study. The sources of information were Cochrane, PubMed and Google Scholar; the terms used to search for information in Spanish, Portuguese and English were: shoulder dislocation, glenohumeral dislocation, shoulder reduction maneuvers, shoulder reduction techniques.

The choice of bibliography exposes elements related to shoulder dislocations, incidence, clinical assessment, imaging assessment, management, conservative treatment and shoulder reduction techniques.

DEVELOPMENT

ANTERIOR GLENOHUMERAL DISLOCATION.

Incidence

Anterior glenohumeral dislocations account for about 90% of shoulder dislocations. Traumatic anterior dislocation of the shoulder is much less common in baseball players compared with contact athletes.

Mechanism of Injury

Anterior glenohumeral dislocation can occur following trauma, from direct or indirect forces. It is usually caused by indirect trauma to the upper extremity while the shoulder is in abduction, extension and external rotation.

Clinical Evaluation

The management of a first episode of anterior shoulder dislocation begins with an analysis of the causal mechanism and a physical examination to establish the diagnosis. The affected patient shows great pain, muscle contracture and characteristically presents with the injured arm held in slight abduction and external rotation. A neurovascular evaluation is of great importance, monitoring the integrity of the axillary nerve. Physical examination reveals decreased contour of the shoulder due to relative prominence of the acromion, with a posterior depression located below the acromion and a palpable mass in the anterior shoulder area.

Imaging Evaluation

Trauma series of the injured shoulder:

- Anteroposterior
- Scapular Y.
- Axillary in the plane of the scapula.

Velpeau axillary projection: in case of not being able to perform axillary radiography.

Special projections:

- Hill-Sachs projection.
- West Point axillary projection.
- Stryker's cleft projection.

Computed tomography can demarcate bone lesions of the anterior impeller, free bodies and compression fractures of the glenoid or humeral head. Magnetic Resonance Imaging determines rotator cuff alterations, Bankart lesion and capsular lesions(1,4,6-8).

Conservative Treatment

After a correct clinical evaluation and good analgesic management, closed reduction should be attempted, intra-articular block and/or sedation may also be used. Some of the maneuvers described for the reduction of shoulder dislocations are:

Hippocrates Technique: with this technique reduction is achieved with only one individual, placing one foot on the axillary crease and chest wall and applying axial traction on the upper extremity with slight internal and external rotation.

Milch Technique: with the affected patient in the supine position and the upper extremity in abduction and external rotation, pressure is applied with the thumb to slide the humeral head into place.

Stimson's Technique: after analgesics and/or sedatives are administered, the affected individual is placed in a prone position with the upper extremity hanging freely from the edge of the stretcher. A light manual traction is applied, as well as a 2.5 kg weight can be hung from the wrist, the reduction will take approximately 15 to 20 minutes.

Spaso Technique: the affected patient in the supine position while the examiner holds the wrist or distal forearm and lifts it vertically with gentle vertical traction and external rotation.

Traction-countertraction.



Kocher Maneuver: not recommended because of the high risk of fracture, the head of the humerus is levered over the anterior part of the glenoid to allow reduction. After reduction, treatment includes immobilization for 2 to 5 weeks. A shorter period of immobilization is recommended in the elderly because of possible stiffness, whereas young people with a history of recurrent dislocation may require more time. After immobilization, it is important to perform rehabilitation, progressively improving external rotation, flexion and abduction, as well as exercises to recover range of motion(1,9).

Self-Reduction Technique: called the GONAIIS method (an acronym for "Grasp a waist-high object, Opposite arm assists, Nonsedated, Autoreduction/autotraction, Immobilize the grasped object, and Squatting and stooping"). To perform the technique, an immobilized object is grasped at waist level. The affected individual may bend backward, stand on tiptoe, or bend the ipsilateral elbow while grasping the object. Mild traction is exerted on the affected arm and gradually pulled back and bent to flex forward and abduct the dislocated shoulder. The involved arm is essentially placed in the scapular plane for the duration of the self-reduction. When the angle of the trunk and engaged arms becomes between 90°, the affected individual begins to squat. The angle should remain at 90° and traction on the involved arm should be maintained throughout the entire time of squatting. After squatting fully, the affected individual bends down and steps back a few steps while remaining in the same position. When the dislocated humerus is not successfully reduced after holding the affected arm in the zero position, the affected person should use the opposite hand to exert pressure to push the humerus back and reduce the dislocation(10,11).

External Rotation Technique: the affected arm is abducted to the chest wall, the elbow flexed at 90°, the shoulder flexed at 20°, grasping the wrist of the affected individual with one hand and securing the elbow with the other hand, the arm was rotated externally, slowly and gently until the forearm is in the coronal plane. No traction is used in the maneuver. After reduction, the arm is internally rotated to bring the forearm to the chest(11,12).

Fee Technique: With the affected individual in the supine position with the upper extremity at his or her side, the examiner secures the affected individual's wrist and gently pulls on the arm to provide traction. The arm is abducted while gradually moving back and forth in small rocking motions (about 10 cm).

Fulcrum Technique: the affected individual in the supine or sitting position and a rolled towel or sheet is placed in the axilla. The distal humerus is adducted with simultaneous posterolateral force on the humeral head. It requires greater force and therefore tends to show greater complications.

Cunningham Technique: with the affected individual seated with the examiner also seated in front of the patient. The affected individual places the ipsilateral hand on the examiner's shoulder. The physician rests one arm in the crease of the affected individual's elbow and uses the other hand to massage the patient's biceps, deltoid and trapezius muscles. After the patient relaxes, he/she is asked to bring the shoulder blades together and straighten the back(13).

Scapular manipulation technique: prone patient with the shoulder flexed 90° and his arm hanging in external rotation. Downward traction is exerted by hanging weights on the patient's wrist or by exerting traction. The physician then pushes the inferior tip of the scapula by rotating it medially upward(11,14).

Figure 1. Anteroposterior view radiographs of the right shoulder of a skeletally mature individual, the image on the left shows a glenohumeral dislocation, the image on the right shows the same individual after closed reduction.



Source: The Authors.



Contraindications

- Humeral neck fractures may cause avascular necrosis.
- Subclavicular and/or intrathoracic dislocations include a subacute dislocation in an elderly individual and an associated surgical neck fracture.
- Avoid multiple attempts in injuries that include neurovascular involvement (including musculocutaneous nerve, brachial plexus involvement, axillary nerve, etc.). If rapid reduction cannot be accomplished without further injury, surgery may be required.
- Suspected arterial injury may require urgent angiography in the first instance(13).

POSTERIOR GLENOHUMERAL DISLOCATION

Occurrence

The glenohumeral joint is the most commonly dislocated joint, however, due to the lower prevalence of posterior shoulder dislocations, about 50% to 79% of posterior glenohumeral dislocations go unnoticed at initial presentation. This type of dislocation is shown in approximately 10% of shoulder dislocations and 2% of all shoulder injuries. Recurrent posterior dislocations are shown in 30% of affected individuals and predispose the joint to degenerative changes.

Mechanism of Injury

Indirect trauma: it is the most common. The shoulder is positioned in a particular way, in adduction, flexion and internal rotation. A posterior dislocation may occur secondary to an electric shock or during a seizure due to the greater muscular force applied by the internal rotators, particularly the pectoralis major, latissimus dorsi and subscapularis.

Direct trauma: is the consequence of applying a direct force to the anterior area of the shoulder, giving rise to a posterior translation of the head of the humerus.

Clinical Assessment

In the evaluation of posterior glenohumeral dislocation, a very notable deformity is not usually visualized, because the injured upper extremity is maintained in the sling position, or rather, with the shoulder in internal rotation and adduction. Sometimes these injuries are often overlooked in case a total radiographic series is not performed. A thorough neurovascular evaluation should be done in order to rule out circumflex nerve injury, although this is rare compared to anterior glenohumeral dislocation. On evaluation, limitation of external rotation usually to 0° and shoulder antepulsion usually to 90° may be seen. Flattening of the anterior area, palpable protrusion in the posterior region of the shoulder and prominence of the coracoid process may be seen(1,4,15).

Imaging Evaluation

Traumatologic series of the injured shoulder:

- Anteroposterior
- Scapular Y.

- Axillary.

An axillary Velpeau projection is sometimes indicated when the patient is unable to position the shoulder for a standard axillary projection.

On the standard anteroposterior view, features suggestive of a posterior glenohumeral dislocation are:

- Sinker sign: impacted fracture of the anterior part of the humeral head on impact with the posterior glenoid rim.
- Empty glenoid sign: the glenoid cavity is partially empty with a gap between the anterior rim and the humeral head > 6 mm.
- Existence of a gap in the superior/inferior glenoid cavity.
- Absence of the normal elliptical overlap of the humeral head over the glenoid.
- Loss of the contour of the neck of the humerus.

Glenohumeral dislocation is best assessed in the axillary projection; CT scan allows us to evaluate the percentage of the humeral head affected in an impacted fracture(1,4,6,9).

Conservative Treatment

Closed reduction requires complete muscle relaxation, sedation and analgesia. Pain in posterior glenohumeral dislocation after acute trauma is usually more intense compared to anterior dislocations, so anesthesia may be required for reduction. With the individual in the supine position, traction is applied to the adducted arm in line with the deformity, raising the head of the humerus slightly toward the glenoid socket. External rotation of the shoulder should not be forced, as it may cause a fracture of the humeral head if it presents an impacted fracture locked over the posterior glenoid rim, if radiographs show this type of fracture, in addition to axial traction should be applied lateral traction on the limb allowing unlocking the head of the humerus. Subsequently a sling with rotation locking should be placed if the shoulder is stable, in case of subluxation or new dislocation, a shoulder cast with a degree of external rotation can be placed to allow the greatest stability. These immobilizations should be kept for 3 to 6 weeks. While the individual is immobilized, isometric external rotation and deltoid exercises can be performed. After removal of the immobilization, an intense program of strengthening of the internal and external rotators should be performed(1,4,9).

In other words, closed reduction is obtained with in-line traction on the affected arm, which is internally rotated and adducted. Traction together with gentle, anteriorly directed manipulation of the humeral head allows it to be guided into the glenoid groove. Contraction can be exerted with a sheet wrapped around the affected axilla. Forced external rotation should be avoided, as this may cause excessive tension on the proximal humerus and result in fractures. Successful reduction is evident when a "thump" is felt as the joint is reduced, pain improves, normal anatomy returns and range of motion allows the affected person to place the palm of the injured arm on the opposite shoulder(11,16).

Another maneuver described is with the affected person in the supine position, an assistant applies anterior pressure to the



humeral head while the examiner applies axial traction to the humerus with internal and external rotation of the humerus(13).

Figure 2. Anteroposterior view radiographs of the right shoulder of a skeletally mature patient, the image on the left shows a dislocated shoulder, the image on the right shows the same patient after closed reduction.



Source: The Authors

Contraindications

- Late presentation to the emergency department (more than 6 weeks).
- Multipart or displaced fractures/dislocations(13).

INFERIOR GLENOHUMERAL DISLOCATION (ERECT DISLOCATION)

A rare disorder, with the most affected population being the elderly. Inferior dislocations of the shoulder have an incidence of approximately 1 in 200 of all dislocations. The diagnosis can usually be made from the door.

Mechanism of Injury

Frequently caused by a hyperabduction force that gives an entrapment of the neck of the humerus over the acromion, levering the head of the humerus and heading in an inferior direction. The superior portion of the articular area is directed inferiorly, without rubbing against the inferior glenoid rim. The diaphysis of the humerus is directed upward. Avulsion and rotator cuff tears, axillary artery injury, pectoralis pectoris injury, brachial plexus injury and fracture of the proximal humerus are common.

Clinical Assessment

Affected individuals commonly present with pain and a saluting position, evidencing a locked humerus in 110° to 160° of abduction and antepulsion. The head of the humerus is usually palpated over the lateral aspect of the thorax in the axilla. It is essential to perform a meticulous neurovascular examination due to the presence of related neurovascular lesions that can complicate this type of dislocation.

Imaging Evaluation

Traumatologic series of the injured shoulder:

- Anteroposterior
- Scapular Y.
- Axillary.

Traditionally the anteroposterior projection gives the diagnosis by showing the inferior dislocation of the humeral head, with the diaphysis of the humerus directed superiorly along the glenoid margin. It is necessary to carefully evaluate the radiographs looking for associated fractures, which are frequent and complex to appreciate by the clinic because of the generalized pain in the shoulder(1,4,8,14).

Conservative Treatment

Reduction is commonly obtained by means of traction-countertraction maneuvers, although it is usually painful. Axial traction is performed by guiding the bony humerus axis in a superolateral direction, gradually decreasing the degree of abduction of the shoulder. Countertraction is applied by placing a sheet around the affected person and applying force in the same direction, but in the opposite direction to the traction vector. The shoulder must be immobilized with a sling for 3 to 6 weeks, depending on the age range of the individual; older individuals need less time to reduce possible shoulder stiffness(1,9).

Contraindications.

- Fractures of the humeral neck or diaphysis should be performed in a surgical setting.
- Any potential for vascular injury(13).



Figure 3. Scapular profile radiographs of the right shoulder of a skeletally mature individual, the image on the left shows a dislocated shoulder, the image on the right shows the same patient after a closed reduction.



Source: The Authors.

UPPER GLENOHUMERAL DISLOCATION

It is an unusual injury, even more difficult to find compared to inferior glenohumeral dislocation.

Mechanism of Injury

When an extreme force is applied in an anterior and superior direction produced directly by the limb being in adduction, as in the fall from a certain height on the upper limb, so that the head of the humerus is directed superiorly from the glenoid cavity. These are related to some fractures such as those of the clavicle, trochlea, trochanter, trochlea as well as the coracoid process and injuries of the acromioclavicular joint. In addition, they are shown with soft tissue alterations such as biceps tendon, rotator cuff, glenohumeral capsule and musculature.

Clinical Assessment

The affected individual commonly arrives securing the upper extremity in adduction, which is shortened. Examination reveals a palpable humeral head above the acromion. Neurovascular lesions are common and should be ruled out in any case.

Imaging Evaluation

Traumatologic series of the affected shoulder consisting of projections:

- Anteroposterior clarifies the diagnosis by showing dislocation of the humeral head above the acromion.
- Scapular Y.
- Axillary.

Radiographs should be evaluated meticulously to rule out associated fractures, which are common and may not be detected on examination because of generalized shoulder pain.

Treatment

Closed reduction should be attempted with analgesics and sedatives, allowing for better reduction; axial traction in the inferior direction with countertraction may be applied along with a lateral traction component. As with inferior dislocations, soft tissue injuries and associated fractures are common; an irreducible dislocation may require open reduction(1,4,11).

Post-Reduction Considerations

- The individual should be placed in a sling.
- Perform a new neurovascular examination.
- Perform post-reduction imaging.
- Follow up with an orthopedist(13).

CONCLUSIONS

As the epidemiology indicates, there is a high incidence of shoulder dislocations, so it is important to recognize the importance of adequate clinical assessment, diagnosis and knowledge of reduction maneuvers for the management of glenohumeral dislocations. There are several types of maneuvers that can be used for reduction of a dislocated shoulder, these maneuvers can be chosen according to the case of the affected individual, in addition to the preference and experience of the person who is going to perform the reduction maneuver. Imaging tests play an important role both at diagnosis and post-reduction to confirm reduction.

BIBLIOGRAPHY

1. Bryam Esteban Coello García, María Paula Cantos Pesántez, Andrea Estefanía Lopez San Martín, Miguel Sebastián Jiménez Jiménez, Edgar Geovanny Sandoval Méndez, Karen Michelle Aguirre Tenorio, et al. GLENOHUMERAL DISLOCATION, ANATOMICAL DESCRIPTION, EPIDEMIOLOGY, MECHANISMS OF ACTION, CLASSIFICATION,



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PRESENTATION, TREATMENT AND

COMPLICATIONS. EPRA Int J Multidiscip Res IJMR. 2023 Nov 6;72-81.

2. Cameron KL, Mauntel TC, Owens BD. The Epidemiology of Glenohumeral Joint Instability: Incidence, Burden, and Long-term Consequences. *Sports Med Arthrosc Rev*. 2017 Sep;25(3):144-9.
3. Stromberg JD. Care of Water Polo Players. *Curr Sports Med Rep*. 2017 Sep;16(5):363-9.
4. Koval KJ, Zuckerman JD. *Fracturas y luxaciones*. 2 ed. Madrid: Marban; 2003.
5. Wolf BR, Uribe B, Hettrich CM, Gao Y, Johnson M, MOON Shoulder Group, et al. Shoulder Instability: Interobserver and Intraobserver Agreement in the Assessment of Labral Tears. *Orthop J Sports Med*. 2018 Sep;6(9):232596711879337.
6. Liliana Ximena Muñoz Maldonado, María Cristina Aumala Barba, Eduardo Marcelo Moposita Alvarado, Karina Mercedes Espinoza Aguirre, Milton Patricio Campoverde Campoverde, Daniela Cristina Velecela Loja, et al. PROXIMAL HUMERUS FRACTURES, ANATOMY, EPIDEMIOLOGY, MECHANISMS OF ACTION, CLASSIFICATION, CLINICAL PRESENTATION, IMAGING PRESENTATION, DIFFERENTIAL DIAGNOSIS, TREATMENT AND COMPLICATIONS. EPRA Int J Multidiscip Res IJMR. 2023 Jun 17;198-208.
7. Carr JB, Chicklo B, Altchek DW, Dines JS. On-field Management of Shoulder and Elbow Injuries in Baseball Athletes. *Curr Rev Musculoskelet Med*. 2019 Jun;12(2):67-71.
8. Kerr ZY, Collins CL, Pommering TL, Fields SK, Comstock RD. Dislocation/Separation Injuries Among US High School Athletes in 9 Selected Sports: 2005-2009. *Clin J Sport Med*. 2011 Mar;21(2):101-8.
9. Buchholz RW, Heckman JD, Rockwood CA, Green DP. *Rockwood & Green's fractures en el adulto*. Madrid: Marbán; 2003.
10. Gonai S, Kamio Y, Matsuoka T, Harunari M, Saito Y, Takuma K. A new autoreduction method for anterior shoulder dislocation: the GONAI method. *Am J Emerg Med*. 2016 Jan;34(1):120.e5-120.e7.
11. Arce Chaves A, Blanco Artola C. Manejo y tratamiento no quirúrgico de la luxación de hombro. *Rev Medica Sinerg*. 2020 Jan 1;5(1):e336.
12. Sapkota K. Comparison Between External Rotation Method and Milch Method For Reduction of Acute Anterior Dislocation of Shoulder. *J Clin Diagn Res [Internet]*. 2015 [cited 2024 Mar 24]; Available from http://jcdmr.net/article_fulltext.asp?issn=0973-709x&year=2015&volume=9&issue=4&page=RC01&issn=0973-709x&id=5738
13. Abrams R, Akbarnia H. Shoulder Dislocations Overview. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Mar 24]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK459125/>
14. Alkaduhimi H, Van Der Linde JA, Flipsen M, Van Deurzen DFP, Van Den Bekerom MPJ. A systematic and technical guide on how to reduce a shoulder dislocation. *Turk J Emerg Med*. 2016 Dec;16(4):155-68.
15. Kelly MJ, Holton AE, Cassar-Gheiti AJ, Hanna SA, Quinlan JF, Molony DC. The aetiology of posterior glenohumeral

dislocations and occurrence of associated injuries: a systematic review. *Bone Jt J*. 2019 Jan;101-B(1):15-21.

16. Kammel KR, El Bitar Y, Leber EH. Posterior Shoulder Dislocations. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Mar 24]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK441919/>

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