Evaluation of New Reduction Technique for Anterior Shoulder Dislocation

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Abstract:-
Traumatic shoulder dislocation is a relatively common & serious injury in sports activities, because of its inherent anatomy & biomechanics. Shoulder joint is one of the most unstable & frequently dislocated joints in the body, accounting for about **50%** of all dislocations .

Aim of study:-to evaluate efficacy of newly developed simple & gentle method of reduction technique for anterior shoulder dislocation.

Material & Methods:-Thirty patients were evaluated & treated by using this method, in a study done within 18 months period in outpatient clinic & emergency department of Al-Kahdymia teaching hospital in Baghdad through 2006 - 2007. Twenty six patients were male and only four patients were female, their age ranging from 18 – 55 years. Reduction technique represent gentle & slow abduction of the extended arm up to 90^{o} , with the same physician's hand gentle axial traction applied, then horizontal adduction of extended arm of dislocated shoulder and thumb of other hand placed against humeral head to assist a reduction while the patient in supine position

Results:-Twenty-four cases which represent 80% from thirty cases of dislocations were reduced successfully from first trail of reduction without using any anesthesia or assistance. Only six cases were failed to reduced by using this method, which represent 20% failure rate.

Conclusion :-Still we can say that, this method have superiority to other methods of reduction , due to its simplicity, efficiency, painlessness , and without reported complications in spite of its limited percentage of failure .

Keywords:- *New, Reduction , Shoulder, Dislocation ,*

Introduction

Traumatic shoulder dislocation is a relatively common & serious injury in sports activities [1], because of its inherent anatomy & biomechanics, shoulder joint is one of the most unstable & frequently dislocated joints in body, accounting for nearly 50% of all dislocations[2], that's why dislocated shoulder should reduced as quickly & a traumatically as possible to prevent further soft tissue damage & to maintain its normal stability by simple , harmless method of reduction.

Shoulder or glenohumeral joint has small bony articulation, and glenoid fossa is a flattened dishlike structure, & only one fourth of the large humeral head articulate with glenoid at any given position.[3-7].

So this small, flat glenoid bony area does not provide inherent stability for humeral head as the acetabulum does for the hip. But the glenoid deepend further more about 50% by presence of glenoid labrum which increase the humeral head contact to about 75%. So the shoulder joint can performed great freedom of movement versus considerable loss of stabilization, **Figure (1).**

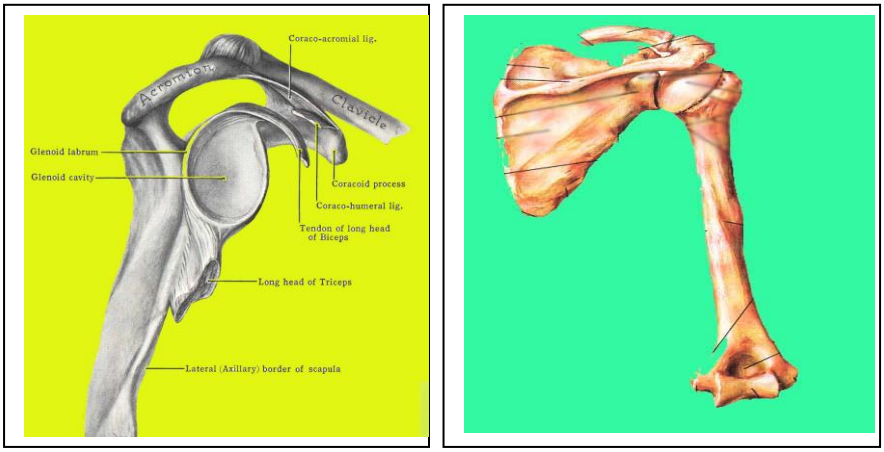


Figure (1): showing shallowness of shoulder joint in both pictures.

Patients & Methods

Thirty Patient (26 men, 4 women), their age ranging from 18 – 55 years old have got traumatic anterior shoulder dislocation who were treated by abduction–horizontal adduction technique, in outpatient clinic & emergency department in Al-Kahdymia teaching hospital in Baghdad , within 18 months period through 2006 - 2007 year.

From 30 patient, 22 case presented as primary dislocation, while 6 cases were presented as recurrent dislocations & only two cases were old neglected unreduced dislocation. Dislocation was diagnosed clinically & radiologically before reduction done.

Method of Reduction

Each patient was placed in supine position on examining table to start reduction by reassurance of patient & to make him relaxed as much as possible without any medication, and the physician should stand on the affected side of patient, holding the wrist of dislocated shoulder by one hand to start gently & slowly abduction of extended upper extremity, till reach 90^0 of abduction, with care taking to avoid patient discomfort during abduction, the patients felt somewhat anxious about this maneuver, but they didn't experience sever pain.

Now at 90^0 abduction , with the same physician's hand gentle axial traction with horizontal adduction applied to extended upper extremity of patient while the thumb of other hand placed against humeral head to check reduction plus applying some pressure to assist reduction till reduction done, which often complete with this step in about 45^0 of horizontal adduction. lastly the arm was brought down to the side for checking joint mobility & then immobilized with sling & swathe.

Results

Twenty four patients, have got successful reduction from first trial by using this **Abduction–Horizontal Adduction** technique, which represent (80%) of study sample. Only six cases, showing unsuccessful trial & they had reduction under general anesthesia because their dislocations were associated with fracture of both greater & lesser tuberosity, & the patients were complained from severe pain & anxiety due to previous failed trial in other hospital, in addition to other factors.

The follow up period of those patients for about 1.5 year show neither immediate complications such as neurovascular injuries, additional fractures, nor recurrent dislocation was reported after reduction.

Regarding **causes of (6) failed reduced cases** whom treated by this method, we think that may be due to some factors related to **either** patients theirself, such as disagreement to do reduction without anesthesia (fear factor), **or** nature of cases itself, such as dislocation associated with multiple fractures or because of its old unreduced neglected dislocation which is difficult to reduced by closed reduction??

Figure (2): Example of X-ray pictures showing anterior shoulder dislocation before & after reduction

Discussion:

By comparing the results of applying this method by original author's (Hiromoto..et al) [4] which represent 91% success rate, with our results which represent 80% success rate, it showing some variation in success percentage, due to some reason or another ,but it still can give good results when used its technique properly .

Analysis of reduction mechanism, at 60º abduction of affected upper extremity, scapula was slightly rotated compared with starting position … & with continued upward elevation up to 90º abduction, scapula will shift more anteriorly with superior rotation along thoracic wall. With horizontal adduction, scapula reach maximum shifting anteriorly & rotating superiorly leading the humeral head to be externally rotated & then reduce at this point **[7]**.

The anatomy of the shoulder joint reveal three kinds of structures & factors which can play role in shoulder joint stability such as, capsular ligaments and four muscle groups in addition to scapular mobility & other factors.**[1,3,7]**

Capsular ligaments…represent the superior, middle & inferior glenohumeral ligaments which fused anteriorly with lateral attachment to glenoid rim and the inferior one, considered the principle static stabilizer of joint & the dislocation did not occur if it was intact.

Muscle groups.. represent the ,first innermost group which consist of rotator cuff muscle that include (supraspinatus, infraspinatus, subscapularis & teres minor), second group consist of tere major , latissimus dorsalis & pectoralis major, third group consist of deltoid & coracobrachialis ,fourth group consist of biceps & triceps brachii.

Other factors include proprioceptive neuromuscular organs in shoulder capsule which can play important role in shoulder stability, while the cohesion produced by joint fluid & vacuum effect produced by negative intraarticular pressure in normal shoulder play lesser role in stability. **Figure (3)**

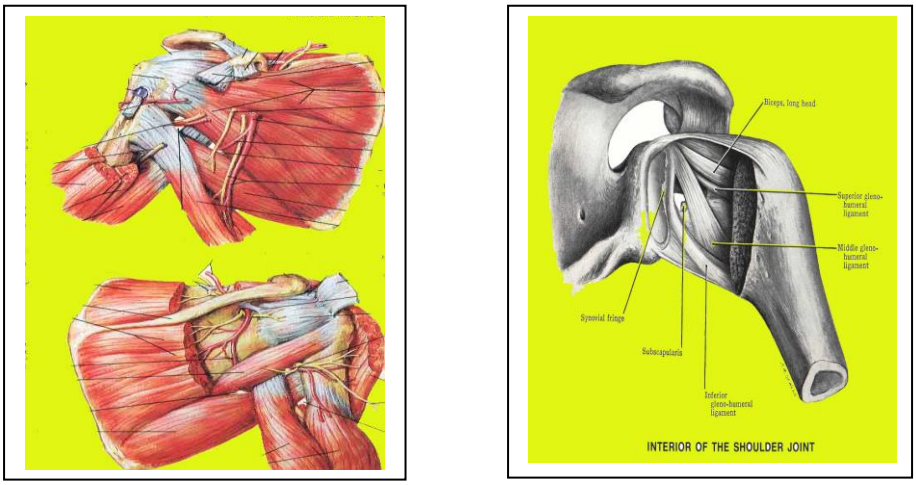


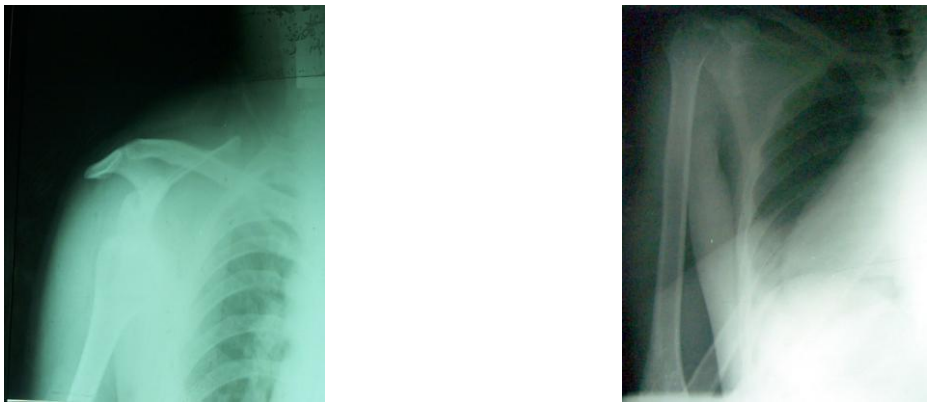
Figure 3 - Muscles & Tendons groups

All the four perihumeral muscle groups run straight to their insertion into humerus oriented along the axis of extended upper extremity at 90º of abduction, and with the help of biceps tendon (longhead) which originates from biceps tubercle at superior rim of glenoid & passes distally in the biciptal groove, guides the dislocated humeral head in direction of glenoid fossa during final stages of reduction.

According to Milch explanation([8], who was reported that the complete overhead abduction is the only position in which a simple force, exerted along the axis of humerus is directed to overcome each and all muscle action at the same time, so the overhead position aligns the shoulder musculature & minimizes muscle spasm, thereby increasing comfort & facilitating reduction.

Recently, many authors have been described numerous techniques to reduce a dislocated

shoulder[9], because the old methods of reduction such as Hippocratic technique or Kocher leverage technique, although they are still effective but frequently fails in muscular & obese patients & sometimes produce iatrogenic humeral neck fractures in elderly patients[6,10] & may injure other soft tissue such as anterior capsule, glenoid labrum & neurovascular structures which may lead to further complications & shoulder instability.



Another example of X-ray pictures showing anterior shoulder dislocation before and after reduction.

Conclusion:

Shoulder joint can performed great freedom of movement versus considerable loss of stabilization, that's why dislocated shoulder should reduced as quickly & a traumatically as possible to prevent further soft tissue damage & to maintain its normal stability by simple, harmless method of reduction ?... The keystone which seems to have important role in this reduction technique is the long head of biceps tendon along with the musculo-tendinosus units of rotator cuff & scapular shifting & rotation.

So we can say that , this method has superiority on other methods of reduction due to its … Simplicity, Efficiency, Complication free , Easy to perform in obese or muscular patients, Does not required analgesia (more or less painless), Does not need assistance .

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