



Case Report

Bilateral anterior glenohumeral dislocation: Two rare scenarios and pathomechanics**Mahesh Kulkarni¹, Sourab Shetty^{1,*}, Sandeep Vijayan¹, Sharath K Rao¹**¹Dept. of Orthopaedics, Kasturba Hospital, Manipal, Karnataka, India

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ABSTRACT

Shoulder dislocations, when they occur, are usually unilateral. Conditions such as epilepsy, electrocution or trauma may present with bilateral dislocations but these are majorly posterior. Hence anterior dislocations when they present with bilaterality are due to simultaneous impact on either sides during trauma and are usually associated with fractures. Pure bilateral anterior dislocations without associated fractures following a case of epilepsy is rarely reported. We are reporting two cases of bilateral anterior shoulder dislocation unassociated with fractures, with less likely etiologies, one was following an epileptic episode and other following road traffic accident. The patho-mechanism and management of these rare injuries are also discussed.

Synchronicity of the force acting on bilateral shoulders makes anterior dislocations a rarer entity than posterior dislocations. Though there is a chance of missing these injuries in the initial presentation, understanding the pathomechanics can help in early diagnosis and timely intervention.

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1. Introduction

Shoulder inherently has a propensity to dislocate anteriorly more commonly than posteriorly. Considering this fact, bilateral anterior dislocations are encountered very rarely as the mechanism for this injury happens very infrequently and are usually associated with fractures. We are presenting the etiology and pathomechanics of two cases of bilateral anterior dislocation of shoulder here which were not associated with fractures : one following an epileptic episode and the other following a road traffic accident.

2. Case 1

A 32-year-old male, following a seizure episode, had a fall and presented to the casualty with complaints of pain and inability to move both the shoulders. Patient was a known case of epilepsy and was on irregular treatment. There was no history of shoulder dislocation previously.

On examination patient had bilateral square shoulders (Epaulet sign)(Figure 1). There was serious restriction of movements on either side and the shoulders were in abduction and external rotation. Duga's test and Hamilton ruler tests were positive on both the sides. No distal neurovascular deficits were detected. Patient had laceration of size 0.5cm × 1cm over the chin.

Plain radiography of both shoulders in antero-posterior view done, which confirmed the dislocation of shoulder anteriorly (Figures 2 and 3).

Under adequate sedation and analgesia closed reduction of both the shoulders were done using Kocher's manoeuvre. The shoulders were immobilised in adduction and internal rotation with separate shoulder immobilisers for three weeks followed by physiotherapy. Patient regained full range of movements and there were no further episodes of dislocation over a two year follow up. He is on regular medication for the seizure disorder.

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Fig. 1: Image showing bilateral squaring of the shoulder (Epaulet sign)



Fig. 2: Right shoulder AP Radiograph



Fig. 3: Left shoulder AP Radiograph

On examination bilateral square shoulder (Epaulet sign)(Figure 4), positive Duga's test and Hamilton ruler test were noted. Both the humeral head were palpable in the deltopectoral groove anteriorly. There were no distal neurovascular deficits. Radiographic examination confirmed the dislocations. Under adequate analgesics and sedation he underwent closed manual reduction in the casualty and bilateral shoulders were immobilised for three weeks followed by physiotherapy. At the latest follow up after 18 months patient had regained complete range of movements without any recurrence of dislocation in both the shoulders.

3. Case 2

A 30-year old male patient presented to our casualty with painful bilateral shoulders, held in slight abduction and external rotation following a motorbike accident. History of ejection from the bike seat and landing on bilateral hands while bracing from the fall was present. Subsequently he was not able to use both the upper limbs. He was not a known case of seizure disorder, diabetes mellitus, alcohol or substance abuse, no history of electrocution and not on any medications. There was no history of loss of consciousness, seizure episode, vomiting or ear / nose bleed.

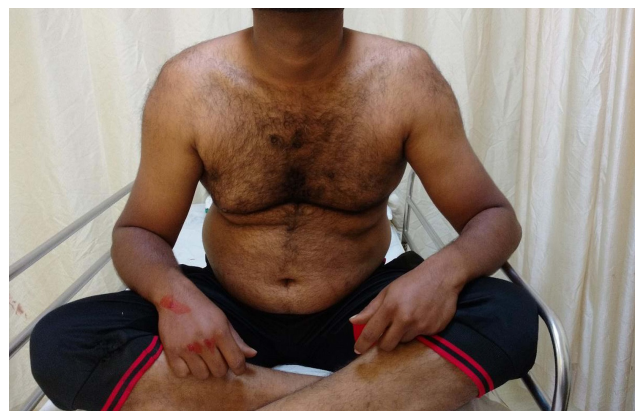


Fig. 4: Epaulet sign

Groups	Causes
Acute muscular violence:	Seizures due to epilepsy, hypoglycaemia, Electroconvulsive therapy, poisoning, CVA, Electroconvulsive therapy
Traumatic	Simultaneous traction; Simultaneous deceleration forces; Fall with shoulder in internal rotation, abduction and extension; Erect dislocation; Multiple injuries
Atraumatic	<i>Neuromuscular disorders:</i> Cerebral palsy, scapular myopathy, myasthenia gravis, Rheumatoid arthritis <i>Habitual:</i> Defect in glenoid labrum, capsule or musculature, Joint laxity, Marfan's syndrome

Fig. 5: Etiological classification of causes of bilateral shoulder dislocation

4. Discussion

With a reported incidence of 17/100,000 per year shoulder is an inherently unstable joint accounting for about 85% of all dislocations.^{1–3} Of all the reported dislocations of the shoulder anterior accounts to 96%, posterior to 3% and 1% are inferior. In 1902, the first bilateral shoulder dislocation was described in a patient which was following muscular contractions caused by a camphor overdose.⁴ Greater tuberosity fractures are quite commonly seen in anterior dislocations which account for almost 15%.^{1,5}

After trauma, with forced extension and abduction of the arm, the humeral head is levered in an inferior manner by the coraco-acromial arch and rotator cuff from the glenoid fossa and anteriorly by the flexors and external rotators resulting in anterior dislocation.³

Brown in his review of bilateral shoulder dislocations grouped injuries according to etiological causes in to three main groups viz following acute muscular violence, traumatic and atraumatic (Figure 5).^{6,7}

The involuntary muscle contractions is recognized as the culprit in epileptic seizures and electrocution responsible for the bilateral posterior dislocations. The imbalance between the contractions of the relatively weak external rotators and the more powerful internal rotators result in adduction and internal rotation of the humerus sufficient to cause posterior glenohumeral dislocation, during an episode of seizure.⁸

Although bilateral posterior dislocations can happen, the synchronicity of the impact required to produce bilateral anterior dislocations are quite uncommon making the injury a rare entity and if it occurs the force of the impact usually causes a fracture. Usually one extremity takes the brunt of the impact with trauma being the most common etiology.^{9,10} Bilateral dislocation needs force to act on both the shoulders simultaneously.^{7,11} Trauma, fall from bike, weight lifting, bench press, horse riding, skiing, diabetic nocturnal hypoglycaemia, domestic assault, grand mal seizures, swimming, gymnasium injuries or electric shocks have been the reported causes which resulted in

bilateral anterior dislocation.^{6,8,9,12,13}

One mechanism for bilateral anterior dislocation following a seizure is thought to occur from the impact of the shoulders to the floor, after the collapse and not during the muscle contractions.⁵ This could be the mechanism in our first case with the seizure disorder, which is in accordance with the history given by the patient. Ramchander et al. have demonstrated in cadavers, the possibility of bilateral dislocation of shoulders anteriorly by gradually increasing the extension while keeping both the shoulders in adduction and internal rotation. In this position with increasing extension humeral neck hitches to the acromion and head will be levered out anteriorly.¹⁴

5–75% cases of shoulder dislocations are associated with a neurological sequel, which can range from involvement of complete brachial plexus to temporary neuropraxia of a single nerve.⁷ Delayed diagnosis is expected in more than about 10% of cases, which can be prevented.^{5,7,8,12} Patients who have delay in diagnosis, associated untreated seizure disorder, associated fractures will usually have bad prognosis.⁶

5. Conclusion

Anterior shoulder dislocations occurring bilaterally are the least common of all shoulder dislocations.^{9,10} Early reduction and immobilisation forms the baseline of management. This is followed by definitive treatment, which could be active and passive physiotherapy after adequate immobilisation or surgery if required, in the more active younger patient group. Given that misdiagnosis sums up to about 10% of bilateral shoulder dislocations,^{8,12} which can quite significantly impact the quality of life, it is important to perform a thorough clinical examination for early diagnosis and management.

6. Source of Funding

None.

7. Conflict of Interest

None.

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