

# Bilateral Anterior Shoulder Dislocation Due to Seizure in a Twenty-One Year-Old Man

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**Introduction:** Shoulder dislocation is the most common presentation of joint dislocation in emergency department (ED). Bilateral shoulder dislocation seldom happens and often is posterior type. It usually occurs due to seizure and electric shock. Trauma is among the common causes of bilateral anterior shoulder dislocation. Here, we present a case of bilateral anterior shoulder dislocation due to seizure attack.

**Case Presentation:** A 21-year-old man presented to ED with complaint of bilateral shoulder pain and restricted range of motion. The patient was under therapy for epilepsy, but discontinued his therapy in recent weeks. He had a seizure attack while sleeping and thereafter he was unable to move his arms. Neurovascular examination of both upper extremities was normal. Shoulder X-ray images revealed bilateral anterior dislocation. Reduction was performed in ED with sedation by adduction and external rotation method. Neurovascular systems were rechecked and reduction was confirmed by radiologic images. Both shoulders were immobilized by sling and swathe, and patient discharged from ED with follow-up recommendation.

**Conclusions:** Bilateral anterior shoulder dislocation is rare. It could be undiagnosed, especially when there is no clear history of major trauma. By awareness of such unusual possibility, early diagnosis, treatment, and reduction can provide desirable outcome.

**Keywords:** Shoulder Dislocation; Seizure; Joints

## 1. Introduction

Shoulder joint anatomy consists of humeral head and glenoid fossa. The glenoid fossa is a shallow cavity, which large humeral head is articulate with. This kind of articulation lets a wide range of movement. However, this joint is not stable enough (1).

Among all joints in the body, the glenohumeral joint has the widest range of motion. It means it should have efficient function. Its function is best served by stabilizer rotator cuff muscles, which helps to maintain the humeral head in glenoid fossa. Glenoid fossa is too shallow to keep the humeral head in it. Therefore, the stability should be preserved by muscles. Anything which disturbs the balance of power in shoulder joint such as rotator cuff injury or rupture would cause the shoulder instability and make it susceptible to dislocation. Once the shoulder dislocates, the rotator cuff is injured to some extent. The complication of glenohumeral joint would be recurrent dislocation and chronic instability. The patient needs follow-up visits to reduce the complications (2)

The most common joint dislocation in emergency department (ED) is shoulder dislocation. Anterior shoulder dislocation is the most common type of shoulder dislocation (3). Bilateral shoulder dislocation is very rare. Most

bilateral shoulder dislocations are presented as posterior dislocation. Common causes of posterior dislocation are seizure or electric shock (4). Bilateral anterior shoulder dislocation is relatively rare and is often due to major trauma (5). Orthopedic lesions due to seizure are often neglected due to lack of trauma. We do not expect the nature of seizure might cause serious orthopedic injury (4). Here, we present a case of bilateral anterior shoulder dislocation due to seizure attack in a young adult.

## 2. Case Presentation

A 21-year-old man was brought to ED by his family with complaint of bilateral shoulder pain and inability to move his shoulders. The patient had epilepsy and was under oral medication therapy for epilepsy for several years. The epilepsy was under control by therapy. He decided to discontinue his medication six weeks before this seizure episode because he had no seizure attacks during therapy. He did not inform anybody that he stopped his treatment. He had a seizure attack while sleeping at night. His brother noticed the bizarre movement of the patient during sleep, which was compatible with generalized tonic clonic seizure. After recovery from postictal period and when the patient became alert and conscious, he reported pain on both

shoulders. He had restricted movements on his arms in shoulder joint and could not raise his hands above head or touch the opposite shoulder. He had no history of previous shoulder dislocation. He had several seizure attacks before epilepsy treatment, but none of them was accompanied by serious orthopedic injury. In ED, the patient was alert, awake, and cooperative. Vital signs were within normal limits. On upper extremities examination, both humeral heads were prominent and palpable under clavicle. They both seemed displaced. Glenoid fossae were empty. No focal tenderness was detected on both sides. The shoulder joints were not red, warm, or swollen. There was no sign of infection. No deformity or other problems were detected on extremities examination on both sides. Bilateral radial and ulnar pulses were palpable symmetrically. In neurologic examination, senses of deltoid area in lateral arms were evaluated. Wrist extension was also tested. In the next step, we evaluated the shoulders by radiographic images. The X-ray images of both shoulders in two views were ordered (Figure 1). Radiographic evaluation revealed anterior dislocation of both glenohumeral joints. There was no obvious fracture of humeral heads, glenoid rims, or clavicles. Reduction was performed in ED. Under close monitoring with proper procedural sedation anesthesia, reduction was done by Leydmeyer method; while the patient in supine position and elbow in 90 degree, the arm was gently adducted and then slowly externally rotated. Reduction was achieved easily. Neurologic examination was done again after the patient became conscious and alert with examining the deltoid area sensation and contraction and wrist extension. Results of vascular examination were also normal. There was no post-reduction problem. Successful reduction was confirmed by both shoulders post-reduction X-ray images. The dislocation to reduction time was less than six hours, which showed no delay in treatment. Both shoulders were immobilized in sling and swathe, and patient was discharged from ED with orthopedic and neurologic follow-up recommendation. Adequate oral analgesia was prescribed for patient. During a four-week follow-up, the patient had satisfactory functional outcome without complication.



**Figure 1.** chest X-ray PA view , bilateral shoulder dislocation

### 3. Discussion

Anterior shoulder dislocation is the most common major joint dislocation presented in the ED. The mechanism of injury involves forceful abduction, extension, and external rotation. It could happen due to direct hit to shoulder or sudden powerful contraction of shoulder muscles (6). When the shoulder extends and abducts, the greater tuberosity is impinged on the acromion and pushes humeral head out of the glenoid. Humeral head is pushed downward by rotator cuff, which results in anterior displacement (7). Anterior shoulder dislocation is usually unilateral, but it is reported to be bilateral in rare cases. Most case reports of bilateral shoulder dislocations were posterior dislocation. Some of bilateral dislocations accompanied fracture (6). Greater tuberosity fracture happens in 15% of the anterior dislocations and indicates an associated rotator cuff tear (4). Electric shock and seizure are two most common causes of bilateral anterior dislocation (6). It could be assumed that bilateral anterior dislocation after seizure attack is not because of muscle contraction, but it could be attributed to trauma by hitting the floor surface or objects around the patient (4).

The first case of bilateral shoulder dislocation was reported in 1902 by Mynter, which was due to shoulder muscle spasm attributed to Camphor overdose (7). Other literatures report different causes such as drug overdose, neuromuscular disorders, and sport injuries. It is not recommended to rely on the clinical findings for accurate diagnosis, and radiologic evaluation is usually recommended (6). Orthopedic lesions due to seizure are often neglected due to lack of trauma. We do not expect the nature of seizure might cause serious orthopedic injury. It was discovered that more than 10% of definite bilateral shoulder dislocations remain undiagnosed in first evaluation and are diagnosed late. It is important to note that close reduction could be done only if less than six weeks have passed since injury. If the patient had shoulder dislocation for more than six weeks, it is recommended not to try for close reduction and patient should be referred for orthopedic consult for surgical reduction (4).

The management of bilateral shoulder dislocation is just like the unilateral anterior dislocation. It can be easily reduced in ED. The anesthesia can be local in joint or through procedural anesthesia (7). Different methods and techniques are described for anterior shoulder reduction. Some of them are no longer used. The most commonly recommended methods are Leidmeyer and Milch. O'Connor et al. reported a success rate of 100% on first attempt by Milch technique. Several variants of the Milch technique have been reported in the literature. Moreover, success rates with Leidmeyer method range from 80% to 90% (8).

Scapular manipulation technique is a favorable technique and has an acceptable success rate. In a study in 2011, it was demonstrated that scapular manipulation technique could be safe without procedural sedation. Re-

duction of anterior shoulder dislocation would be rapid and relatively painless in the ED (9).

Immobilization is done after reduction with sling and swathe bandage or a Velpeau sling. The shoulder is immobilized for three to six weeks in patients younger than 40 and for one to two weeks in those older than 40 years. Initiation of early shoulder exercise would help reduce the risk of adhesive capsulitis and other complications (8). The need for surgery arises when the patient encounters recurrent shoulder dislocation. Most of them are under 40 years old (6).

In a review of seventy cases of bilateral anterior dislocation in 2013, bilateral anterior dislocations were classified according to mechanism of injuries. Most of the patients were men (70%) and had mean age of 33.5 years. In women, it occurred in the elderly with the mean age of 57 years. The most common causes were trauma (50%) and muscle contractions (37%) due to seizures or electrocution. In 15.7% of the cases, the diagnosis of bilateral anterior dislocation was not immediate, but less than three weeks, and it was not traumatic in these cases (10). Among 30 case reports of bilateral shoulder dislocations, nine cases (30%) had an associated injury (11).

Bilateral anterior shoulder dislocation is the rarest form of shoulder dislocation. The most important hazard is remaining undiagnosed, especially when there is no clear history of major trauma. Radiologic imaging plays a very important role in diagnosis in such patients. Being aware of such unusual possibility, early diagnosis, treatment, and reduction can provide satisfactory functional outcome with less complication (12).

It is not expected to develop an anterior shoulder dislocation without a history of trauma in seizure, and because of drowsiness in postictal period, important orthopedic lesion could be easily neglected and misdiagnosed.

It is recommended to take a careful history and examination in patient who had seizure attack, especially musculoskeletal system examination, and in conditions suggestive of orthopedic injury, more investigations should be done. Radiographic evaluation is recommended if there is suspicion of fracture or dislocation. This could

help rule out serious orthopedic injury easily and decrease the rate of misdiagnosis. Being aware of possible injuries associated with seizure is the key.

## Authors' Contributions

Behrang Rezvani Kakhki developed the original idea and the protocol, abstracted and analyzed data, wrote the manuscript, and was the guarantor. Javad Tootian Torghabeh, Azadeh Mahmoudi Gharaee, and Morteza Talebi Doluee contributed to the development of the protocol, abstracted data, and prepared the manuscript.

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