

## The overlooked side of convulsion: bilateral posterior fracture and dislocation of proximal humerus

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### Abstract

Injuries after an epileptic convulsion have been seen commonly such as burns, head injury and dislocation of the extremities. But fractures of the extremities due to convulsion are rare. External trauma mechanism is not necessary for extremity fractures. Muscle contractions can cause increased load on the skeleton and it can be complicated by dislocation and/or fracture of extremities. Almost 1-4% of all the shoulder dislocations are posterior. In this case report we present a 32 year old male patient who had bilateral posterior fracture and dislocation of proximal humerus after convulsion. We would like to emphasize that it is so important to make systemic examination and evaluation of the patients who were admitted to emergency department after epileptic convulsion.

**Keywords:** Convulsiyon, Bilateral posterior fracture, Dislocation of proximal humerus.

### Introduction

Posterior dislocations of the shoulder are rare and it is almost 1-4% of all of the shoulder dislocations. Only 50% are diagnosed in the acute phase, in view of pseudo normal position of the arm in adduction and internal rotation.<sup>1</sup> And it is known that most of the posterior dislocation of the shoulder occur due to epileptic seizures. High forces are needed to sustain these injuries. It is called 'triple E syndrome; electrocution, extreme trauma and epilepsy' and described by Brackstone et al.<sup>2</sup> Misdiagnosis of this injury may occur in 50% to 79% of patients, most commonly due to lack of clear clinical signs and inappropriate radiographic evaluation.<sup>3,4</sup> It can be difficult to evaluate posterior shoulder dislocations by using antero-posterior radiographs, so it can be necessary to perform computerized tomography imaging in the suspected situations. But because of the emergency physicians focused on convulsion such kind of fractures and dislocations could be overlooked.

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### Case Presentation

A 32 year-old-male patient was admitted to emergency department with difficulty to move both of the arms. In the anamnesis, we learned from the family members, 3 hours before the admission the patient had an attack of loss of consciousness, deviation of the eyes and urinary incontinence, which lasted for 3 minutes. The patient had no history of convulsion or another chronic disease or medication. On admission the patient was cooperative and oriented. He complained of shoulder pain especially on movements. On physical examinations the blood pressure was 140/85 mmHg, pulse rate; 102 beats/minute and regular, and temperature was 36.7°C. Muscle power of bilateral proximal upper extremities were 1/5 and 5/5 for distal part of the extremities. Cerebellar tests could not be performed because of problem with shoulder movements. There was no abnormal value in blood count and biochemical values except elevated creatine-



**Figure-1:** Antero-posterior X-ray graphy showed posterior shoulder dislocation and fracture on left side of humerus.



**Figure-2:** Antero-posterior X-ray graphy showed posterior shoulder dislocation and suspected fracture on right side of humerus.

kinase (650 U/L, normal; 39-308 U/L). In order to exclude an intracranial pathology, a brain CT scan was performed which was normal. To investigate the cause of shoulder pain, an antero-posterior X-Ray was performed which showed bilateral posterior shoulder dislocation and fracture on the left side (Figure-1). There was a suspected fracture line on the right side (Figure-2). To confirm the suspected fracture on right side, an axial computerized tomography was performed. It revealed both fracture and dislocation of the humeral head. The patient was referred to the department of orthopaedics and traumatology for surgery.

## Discussion

Muscular forces generated during seizure can lead to various dislocations and fractures including that of shoulder, jaw and hip.<sup>5</sup> Risk factors for fractures among epileptic patients include

recent diagnosis of epilepsy, age 45 years or older, male gender, generalized tonic-clonic convulsion and antiepileptic drug polypharmacy. But our patient had none of these risk factors except a history of convulsions which was not revealed by family members. Most posterior shoulder dislocations have been attributed to high energy trauma, seizures, electrocution or electroconvulsive therapy.<sup>6</sup> However convulsive epileptic seizures are the most common cause of bilateral fracture dislocation in 78% of the cases reported before.<sup>7,8</sup>

In the course of a seizure, the shoulder is in a position of flexion and adduction. In this position, the humeral head is drawn cranially and posteriorly against the glenoid fossa by contraction of the shoulder muscles.<sup>7</sup> During the seizure, the anatomical neck of the humerus is pulled towards the rim of the glenoid fossa, becomes impacted and can eventually be fractured.<sup>5</sup> Apparently the same mechanism occurred in our patient during the seizure. Shoulder pain following a convulsive seizure should always raise suspicion to posterior shoulder fracture and dislocation.<sup>7</sup> In this situation the most appropriate radiological investigation is computerized tomography scan which detects the fracture line.

## Conclusion

Clinical suspicion supported by physical examination, along with comparative imaging (X-ray) is a simple method which gives an accurate diagnosis and prevents possible complications, as in our case.

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