

## Case Report

## Simultaneous bilateral posterior fracture-dislocation of the shoulder: a rare case report

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**Abstract:** Simultaneous bilateral posterior dislocation of the shoulder complicated with a fracture (fracture-dislocation) is an extremely rare condition and the relevant literature contains very few published case reports. Besides its rarity, this complicated condition may cause delays in diagnosis because of the physicians' tendency to use plain radiography which is known to have low sensitivity in detecting concomitant fractures. This report describes a successfully treated case of simultaneous bilateral fracture-dislocation of the shoulder which could be clarified by computed tomography (CT) performed following a failed reduction of the shoulders. In conclusion, physicians should consider this rare entity and if there is a doubt CT should be performed for accurate diagnosis.

**Keywords:** Posterior fracture-dislocation, bilateral, shoulder, seizure

### INTRODUCTION

Shoulder joint is known as the most frequently dislocated joint of the human body. As opposed to unilateral shoulder dislocations, simultaneous bilateral dislocations are rare occurrences. The relevant literature contains very few descriptions of case reports of simultaneous bilateral posterior shoulder dislocation [1]. Also, there is an increased risk for dislocation-associated fracture (fracture-dislocation) of humeral head and shaft in some cases of the bilateral shoulder dislocation. Bilateral posterior dislocation of the shoulder complicated with a fracture has the incidence of 0.6 cases among a population of 100.000 people per year which makes it an extremely rare condition [2]. Besides its rarity, this complicated condition may act as a diagnostic trap. Because, plain radiography of the shoulder is the most common diagnostic tool to diagnose shoulder dislocations and has low sensitivity in detecting complications such as fractures.

We hereby present a very rare case of bilateral posterior fracture-dislocation of the shoulder following a convulsive seizure in which the exact diagnosis could be obtained with a delay, due to a lack of radiological evaluation.

### CASE PRESENTATION

A previously healthy 52-year-old male presented to the emergency department of our hospital after the first incidence of a tonic-clonic convulsion. This convulsion was witnessed to end forty minutes

ago. On admission, the patient was confused, orientation and cooperation were limited. His pupils were bilaterally isocoric. Direct and indirect light reflexes were bilaterally positive. There was no evidence of a lateralizing sign or a motor deficit. Deep tendon reflexes were normoactive, Babinski sign was negative and there was no stiffness in neck. He gave no history of a chronic disease or a medication. He had never consumed illicit drugs, had no allergies, and had no history of an alcohol addiction. Unfortunately, during his stay in the emergency department he experienced a new tonic-clonic convulsion which was recovered by using intravenous diazepam.

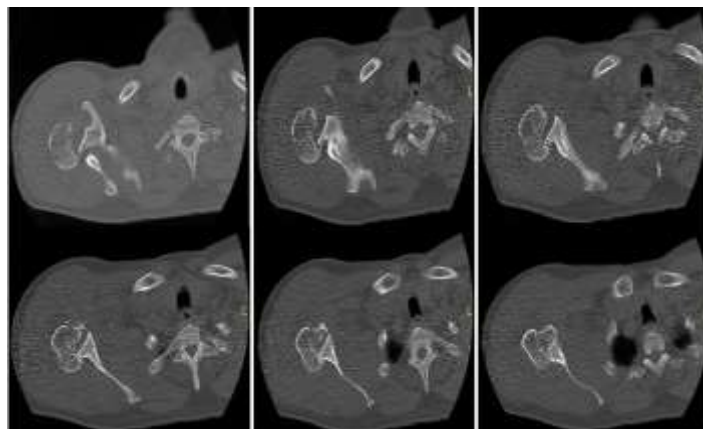
After the convulsions ceased, the patient complained of bilateral shoulder pain. There was no ecchymosis or dermabrasion on the both shoulders. Both arms were fixed in adduction and internal rotation; external rotation was impossible. Both humeral heads were palpated in the posterior aspect of each joint and there was a painful restriction of range of motion in both shoulders. Neurovascular examination of both arms was normal; he had complete motor function in both hands and wrists. Anteroposterior radiographs of the shoulders showed loss of the glenohumeral joint line parallelism and fixation of both shoulders in internal rotation [Figure 1]. Although it was decided to perform sedation-assisted closed reduction of the both shoulder joints, post-reduction x-rays showed a failed reduction attempt. Following this failed attempt of closed reduction, a computed tomography (CT) of the

shoulders was performed. CT scans confirmed a large impacted fracture of the both humeral heads which were displaced posteriorly [Figure 2 and Figure 3]. Based on the clinical and radiological findings, a diagnosis of bilateral posterior fracture-dislocation of the both shoulders with no neurovascular deficit was made. The patient underwent surgical treatment after he was informed about the risks, complications, and benefits of the surgery. Firstly, right shoulder was explored after releasing pectoralis major muscle using the deltopectoral approach. Avulsion fracture of the

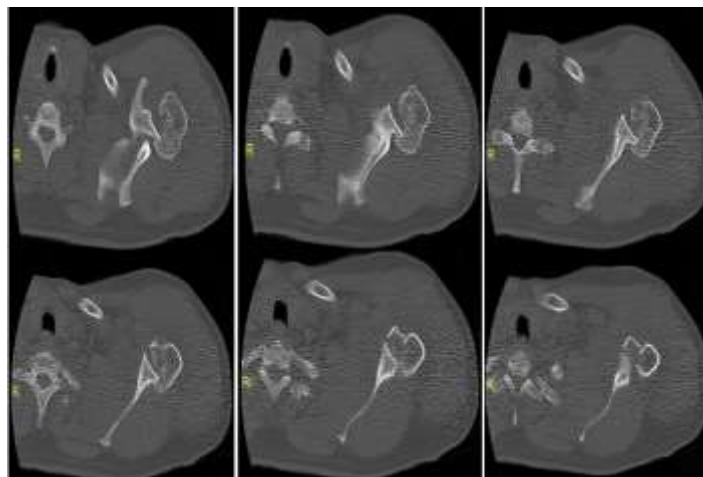
tuberculum minus was noticed and it was fixed into the humeral head with 4mm cannulated screws. Then, bicipital tenodesis procedure was performed for bicipital groove which was found to be broken. Finally, same steps were performed for the left shoulder. Both of the shoulder were fixed in external rotation. At 12 weeks postoperatively, full range of motion was accomplished. At follow-up of 6 months, the patient reported no more pain and had fully returned to his normal activities of daily living without any discomfort.



**Fig-1: Plain radiography of the patient following the convulsive seizure**



**Fig-2: CT images of the right shoulder following the convulsive seizure**



**Fig-3: CT images of the left shoulder following the convulsive seizure**

## DISCUSSION

Bilateral posterior fracture-dislocation of the shoulders is a rare clinical presentation which was first described by Mynter in 1902 [3]. There are three main described etiologies of this rare condition termed as “triple E syndrome”, which comprises epilepsy or any convulsive seizure, extreme trauma, and electric shock [4]. Seizures account for approximately 50% and trauma 45% of all cases. Rest of the cases (5%) are caused by electrocution [5]. It is obvious that, bilateral posterior fracture-dislocation of the shoulder in this case occurred as result of convulsion seizure, consistent with the previous data.

The proposed mechanism of bilateral shoulder dislocation is forcing humeral head to internal rotation and adduction which frequently occurs during a seizure [6]. Shaw reported the detailed mechanism of this condition as follows: during the convulsive episode, the shoulder is held in adduction, flexion, and internal rotation, and it is the contraction of the shoulder girdle muscles which force the humeral head superiorly and posteriorly. The final step in the process is due to infraspinatus, teres minor, deltoid, latissimus dorsi, and teres major muscles, which provide the force necessary to produce dislocation [7].

Bilateral posterior shoulder dislocation should be suspected in patients with a fixed internal rotation deformity, a palpable prominence of the coracoid, an increased palpable prominence of the humeral head in the posterior aspect of the shoulder, and a marked complete loss of external rotation [8, 9].

Bilateral posterior fracture-dislocation of the shoulder is a diagnostic challenge. Misdiagnosis or delayed diagnosis of this injury may occur on initial evaluation in 50% to 79% of the cases, mainly due to its rarity, lack of clear clinical signs, and radiological investigation [10, 11]. Anteroposterior and lateral (Scapular Y) radiographs of the shoulder are the most commonly used diagnostic tools for demonstrating posterior dislocation of the shoulders. However, compared with plain radiographs, CT has more sensitivity for suspected posterior dislocation of the shoulder, and also provides detailed description of lesion [12]. Because, bilateral posterior shoulder dislocation may be presented with fractures of the glenoid rim, humeral head, humeral shaft, or lesser tuberosity and these complications could not be detected by plain radiography, as seen in this case. In this case, plain radiography could not reveal concomitant fractures and oriented us to an attempt of closed reduction. Following this failed attempt of closed reduction, CT scanning of the shoulders clarified the situation.

Management of this injury must be individualized depending on the type of the lesion, amount of the defect of the humeral head, the time from

injury and the age of the patient. For chronic dislocations (older than 3 weeks), closed reduction is highly unsuccessful in both young and older patients [13]. In young patients, dislocations fewer than 3 weeks old with minimally displaced fractures, closed reduction and if needed pin fixation is an option [14, 15]. If an attempt of closed reduction is not successful open reduction and internal fixation should be done. If open reduction can not be performed and in cases more than 50% of the articular surface is damaged, shoulder arthroplasty is a solution [16]. For older patients (>65 years old) with three or four-part acute fractures the most significant option is hemiarthroplasty, because there is an increased risk of avascular necrosis [17, 18]. In older patients with fracture-dislocation of the shoulder associated with severe distortion of the bony anatomy and rotator cuff tear, reverse total shoulder replacement may be an option [19]. If there is an involvement of the humeral head and a damage of the glenoid, a total shoulder arthroplasty is likely to provide good results in both young and older patients [20].

In conclusion, physicians working in the emergency department should evaluate bilateral fracture-dislocation of the shoulder in patients with the previously explained findings. In addition, if there is a doubt, CT should be considered as a diagnostic method instead of plain radiography for earlier diagnosis of this condition.

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