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Bilateral anterior fracture-dislocation of shoulders following new onset seizure

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Abstract
Shoulder dislocations following seizure are usually posterior, and can be disabling. Anterior dislocations following seizure are rare and more seldom are bilateral anterior fracture dislocations. Following proper assessment, this pathology can be treated surgically with good outcome.
Case Report: A 40 year old male presenting with bilateral anterior fracture dislocations of the shoulder following a new onset seizure, was evaluated and xrays revealed a right 3 part fracture of the right proximal humerus with anterior dislocation and a left 4 part fracture of the proximal humerus with anterior dislocation. Subsequently had open reduction and internal fixation with the Proximal Humeral Interlocking System (PHILOS) plate, had rehabilitation and discharged with a satisfactory outcome.
Bilateral anterior fracture dislocations following seizure disorder is a rare condition that warrants proper evaluation, treatment with the Philos plate and rehabilitation affords good outcome.\

Keywords: fracture dislocation, shoulder, and seizure.

Introduction
Bilateral dislocations of the shoulder are very rare and when they do occur, are usually posterior and arise secondary to seizures, epilepsy, electrocution and hypoglycemia [1]. Simultaneous bilateral anterior shoulder dislocations are usually of traumatic origin and occur rarely [2]. Bilateral fracture dislocations of the shoulder are even less commonly reported. We present a case of bilateral anterior fracture dislocations of the shoulder secondary to a seizure.

2. Case Report
O.B is a 40 year old man who was referred to our facility on account of complaints of pain and limitation of movement in both shoulders following a generalized tonic-clonic seizure which was spontaneous, and lasted for 3 minutes, followed by 4 minutes of loss of consciousness.
He was not a known seizure disorder patient and not on any medications. No prior history of trauma and no family history of seizures.
Physical examination revealed a young man, with deformity and tenderness of shoulders, limitation to both active and passive ranges of motion, no neurovascular deficit.
The CT (computed tomography) scan of the brain revealed no significant abnormality. Anteroposterior radiograph of the right shoulder demonstrated an anterior glenohumeral dislocation with an associated 3-part fracture of the proximal humerus and displacement of the greater tuberosity and shaft. An anterior glenohumeral dislocation of the left shoulder was also seen with a 2-part fracture of the left proximal humerus involving the greater tuberosity with >3 cm displacement. Overlying soft tissue swelling was seen in both shoulders. Patient was unable to be positioned optimally for other views. He was also seen by the neurologist who prescribed anticonvulsants in the perioperative period and an EEG which revealed normal findings.

3. Results and Discussion
Bilateral shoulder dislocation was first described in 1902 in a patient in who had camphor overdose thus having excessive muscular contractions [3].
Bilateral shoulder dislocations are relatively uncommon, accounting for 15% of all dislocations. Ninety-five per cent of shoulder dislocations are anterior and 15% of them are combined with greater tuberosity fractures [4] as in the index patient. Anterior shoulder dislocations are almost always secondary to trauma [5]. Bilateral anterior dislocations of the shoulder have been described but are rare, because the mechanism necessary to produce such injury is unusual [6].
Electric shock and seizure are two most common causes of bilateral anterior dislocation [7]. 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. However, posterior dislocations are more common after seizures because the contractions of the relatively weak external rotators and the posterior fibers of the deltoid are overcome by the more powerful internal rotators. The resulting adduction and internal rotation usually causes the humeral head to dislocate posteriorly[8]. One suggestion about bilateral anterior dislocation following a seizure is that this may occur not during the muscle contractions but from the trauma of the shoulders striking the floor, after the collapse [9]. The reason why the shoulder dislocates anteriorly after trauma is that, as the arm extends and abducts, impingement of the greater tuberosity on the acromion levers the humeral head out of the glenoid [10]. Moreover the rotator cuff pushes

downwards the humeral head which is finally displaced anteriorly by the flexors and external rotators. Bilateral occurrence of anterior shoulder dislocation is rare because almost always one extremity takes the brunt of the impact during the trauma incidence [10]. This may suggest that loss of consciousness after the seizure did not allow the patient to react and reflexively protect one of his arms by exposing the other [1].Associated fracture of the greater tuberosity indicates an associated rotator cuff tear. Fracture-dislocation of the proximal humerus is typically associated with epilepsy, electrocution or extreme trauma, the so-called "Triple E" syndrome coined by Brackstone [10].

Although full musculoskeletal examinations are not routinely performed following a seizure, radiographic examination of the shoulders should be performed in case of suspicion. Routine radiological assessment is done with antero-posterior and axillary views of shoulders, but when surgical treatment is considered computed tomography (CT) images of shoulders are needed as they provide more information such as better visualization of the fracture in the humeral head than conventional X-ray films. It also demonstrates fracture fragments and their alignment which may not be seen on conventional X-rays.

If the greater tuberosity fracture is displaced the diagnosis of a rotator cuff tear is almost certain [9]. In this case an MRI may be indicated prior to undertaking surgical repair. The index patient did not have an MRI.

There may be long term instability and functional impairment if the fragment is not anatomically reduced [10]. Thus internal fixation after the reduction must be the rule in such cases. The implant used for the index patient was a PHILOS plate which is the standard for ORIF in such cases [11].

4. Tables and Figures

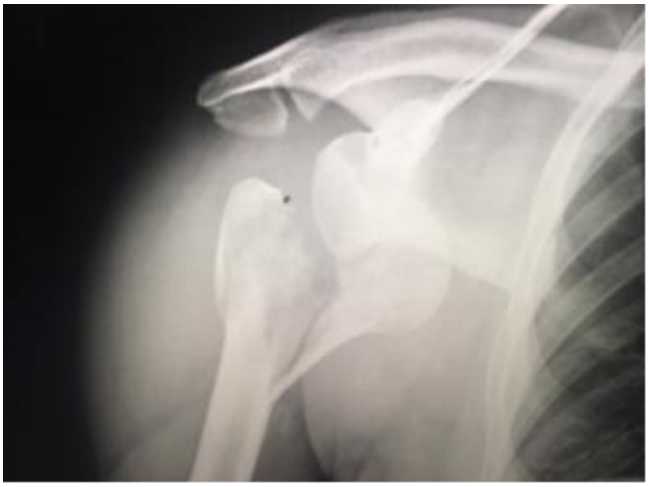

Fig 1: Anteroposterior radiograph of the right shoulder showing inferomedial displacement of the head of the humerus from the glenoid fossa, consistent with an anterior dislocation. A 3-part fracture of the proximal humerus is also seen with displacement of the greater tuberosity and shaft.

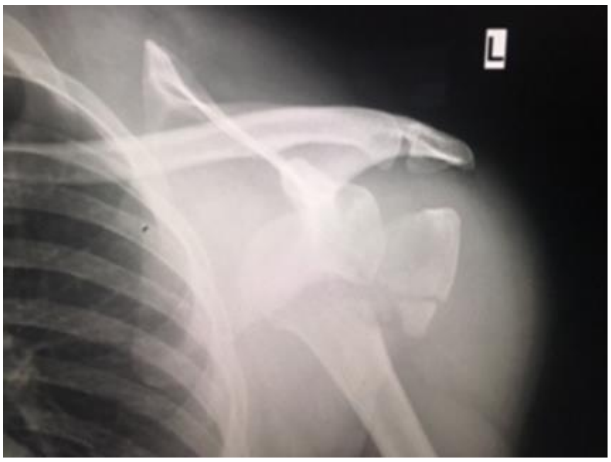

Fig 2: Anteroposterior radiograph of the left shoulder showing inferomedial displacement of the head of humerus from the glenoid fossa, indicative of an anterior dislocation. Also noted is a 2-part fracture of the left proximal humerus involving the greater tuberosity with displacement. Smaller bony fragments are also seen.

A diagnosis of bilateral anterior fracture dislocation of the shoulder was made and was counselled and prepared for Open reduction and internal fixation with PHILOS plate on both sides which he had 3 days apart using the deltopectoral approach. Intraoperative findings on the right side included a displaced 3-part fracture of the proximal humerus Dislocated and Isolated humeral head, Anterior labral tear and Dislocated long head of Biceps tendon. On the left side, findings included Ruptured Anterior capsule, Partially turn subcapsularis, Dislocated Long head of Bicepts, Anterior dislocation of the head of humerus, Large Bankarts Lession, anterior labrum, Displaced greater tuberosity fracture. For both surgeries, Shoulder was Reduced by traction external rotation and levering of the head into the glenoid cavity,Long head of biceps released to aid reduction- and repaired via transosseous tenodesis, Greater tuberosity fracture reduced by traction and percutaneous pinning under C-arm guidiance. P.major and common tendon repaired using vicryl sutures. He was placed on shoulder immobilizers and arm slings postoperatively and commenced rehabilitation exercises on outpatient basis.

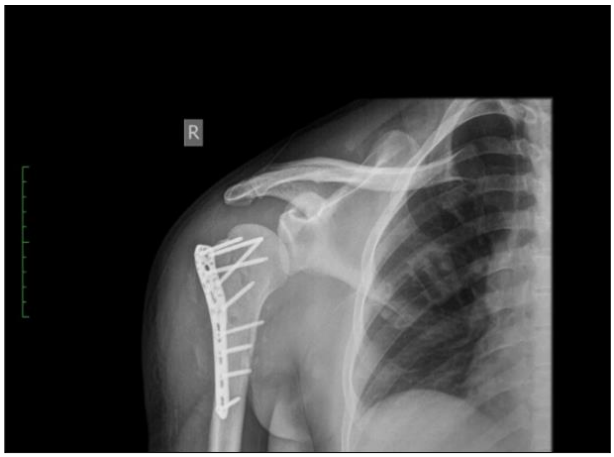

Fig 3: Post-operative radiograph of right shoulder following ORIF with 4 hole PHILOS plate.

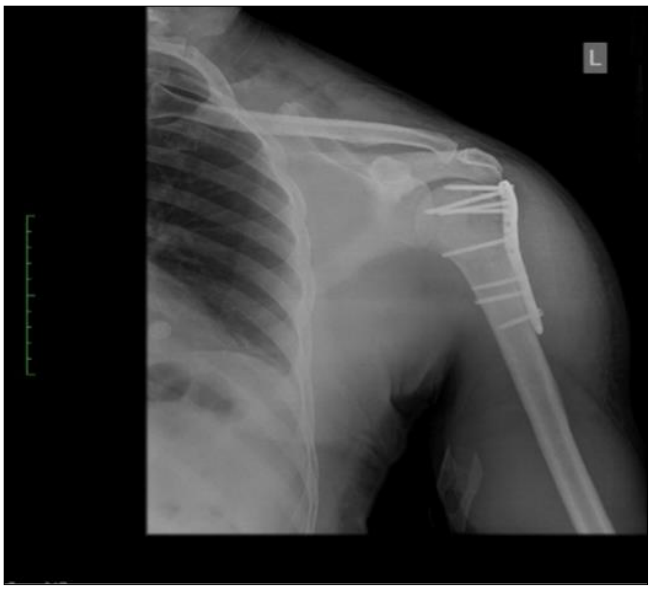

Fig 4: Post-operative radiograph of left shoulder following ORIF with 3 hole PHILOS plate.

5. Conclusions

This case report is of interest as it highlights the possibility of a first time seizure in an otherwise healthy adult leading to bilateral fracture-dislocation of the shoulder. Classification systems exist individually for both proximal humeral fractures and shoulder dislocations, however, a combined classification system is yet to be devised for fracture-dislocations of the shoulder, the index case and other similar cases may thus serve as an eye-opener for devising a possible classification for fracture dislocations i.e unilateral/ bilateral, number of parts and nature of dislocation.

Bilateral anterior fracture dislocations following seizure disorder is a rare condition that warrants proper evaluation, treatment with the Philos plate and rehabilitation affords good outcome.

6. References

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