



## Case Report

# The importance of imaging for status epilepticus patients to rule out fractures – A case report

Bashir Alenazi, MD<sup>a,\*</sup>, Abdul-Qayyum Rana, MD<sup>b</sup> and Haris Munir Vaid, B.Sc<sup>b</sup>

<sup>a</sup> Riyadh Military Hospital, Riyadh, Kingdom of Saudi Arabia

<sup>b</sup> Parkinson's Clinic of Eastern Toronto, Toronto, Canada

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### المخلص

يمكن أن تكون الحالة الصرعية هي الظهور الأول لمرض الصرع وقد تحدث عند مرضى الصرع المعروفين. وفي الأدبيات البحثية المنشورة هناك تقارير عدة عن حالات كانت فيها النوبة شديدة بدرجة أدت إلى خلع أو كسر في الكتف أو الورك، كما قد تسبب الوفاة نتيجة النزف. ومع أن إصابة الكتف والورك نتيجة النوبة نادرة ولكنها ممكنة، خاصة عند المرضى الذين لديهم تاريخ مرضي لهشاشة العظام أو عوامل خطر أخرى لحدوث الكسور. نعرض هنا حالة مريض عمره 35 عاماً صحيح البنية، وليس لديه تاريخ مرضي لهشاشة العظام أو انخفاض في كثافة العظام. وكان الظهور الأول للصرع لديه هو الحالة الصرعية التي كانت عبارة عن نوبة طويلة أدت إلى كسر في الحرق على الجهتين مع كسر في أدنى العضد الأيسر. مع أن هناك تقارير كتبت عن حالات كسور وخلوع في الأوراك والأكتاف مصاحبة لنوبات حدثت، ولكنها حدثت في حالات قليلة فقط. حالتان منها كانت لمرضى يعانون من صرع وهشاشة ولين العظام. وحسب معرفتنا فإن هذه الحالة هي الأولى في الأدبيات المنشورة التي حدث لها كسور في الوركين والكتف وليس لديها تاريخ مرضي لصرع أو نوبات. باستثناء نوبة حموية قبل سن الخامسة لم تستدع العلاج، ولم يستعمل أي علاج آخر للصرع يمكن أن يسبب انخفاض في كثافة العظام. توضح هذه الحالة شدة الحالة الصرعية وأهمية المسح الكامل للكسور في المرضى المصابين، خاصة من لديهم عوامل خطر أخرى لحدوث انخفاض في كثافة العظام.

الكلمات المفتاحية: الحالة الصرعية؛ الصرع؛ النوبة؛ كسر الكتف؛ كسر الورك

### Abstract

Status epilepticus could be the first presentation of underlying epilepsy or may occur in patients with known epilepsy. The literature has reported many cases of seizures severe enough to cause dislocations or fracture-dislocations of the shoulder or hip joints and death from hemorrhaging. Although shoulder and hip injuries due to seizures are rare, such events are known to occur, especially in patients with a history of osteoporosis or other risk factors for fractures. We describe a case of a 35-year-old healthy male with no history of osteoporosis or reduced bone density. His first presentation of epilepsy manifested with status epilepticus. This prolonged seizure resulted in bilateral acetabular fracture with left proximal humerus fracture without any trauma or falls. Although fractures associated with seizures have been reported in the literature, dislocation and fractures from seizures involving both the hip and the shoulder joints have only been described in a few cases. Two of these cases involved patients with known epilepsy, osteoporosis and osteomalacia. To the best of our knowledge, this is the first described case of a patient with bilateral hip and one shoulder fracture that had no previous history of epilepsy or seizures, except for febrile seizure as a child, which did not require any treatment. He was also not taking any antiepileptic medications, which are known to reduce bone density. This case shows the severity of status epilepticus and the importance of screening for fractures in patients, especially in those with risk factors for reduced bone density.

\* Corresponding address: Consultant Orthopaedic Surgeon, Riyadh Military Hospital, Riyadh, Kingdom of Saudi Arabia.

E-mail: benazil1@yahoo.com (B. Alenazi)

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## Introduction

Status epilepticus (SE) is defined by continuous seizure activity for more than 10 min or two consecutive seizures without regain of consciousness in between. SE can lead to brain damage, coma, or other complications<sup>1</sup>. In rare events, these seizures can be further complicated by dislocations of joints and/or proximal fractures of the limbs or death due to massive blood loss. These injuries result from severe muscle contractions during tonic-clonic seizures<sup>2-5</sup>. We describe a case of 35-year-old man with bilateral acetabular fractures and left proximal humerus fracture due to convulsions from SE. Our case is remarkable as our patient was previously healthy. He had no history of osteoporosis or loss of bone density, epilepsy or seizures, except for febrile seizures as a child, which did not require treatment. He was also not taking any anti-epileptic medications, which is known to reduce bone density<sup>6</sup>. We further suggest recommendations for screening patients for possible fractures presenting with SE who have risk factors of decreased bone density.

## Case report

This 35-year-old male developed a sudden episode of seizure while lying down in bed in the early morning as witnessed by his wife. The patient had a sudden onset of aggressive shaking of both sides lasting 10 minutes, with drooling, eyes rolling backwards and loss of consciousness. The convulsion was not accompanied by any form of trauma or falls. During the postictal state, the patient regained consciousness but remained confused and lethargic for several hours after the event. The patient had no recollection of the episode. He did not have a history of previous seizures, except before the age of 5 years, when he had one episode of febrile convulsion, which did not require treatment with antiepileptic medications.

There was no history of trauma, osteoporosis, other joint or limb pain. The patient was started on Phenytoin. An MRI Brain and EEG were ordered and found to be normal. As the patient's mental status improved and he regained alertness, he started reporting severe pain on both sides of his hip and his left shoulder. His examination revealed swelling and diffuse tenderness of both hips and left shoulder joint. The range of motion was painful with crepitus and he was unable to mobilize the affected joints. The CT and X-ray scans of the joints revealed bilateral acetabular fractures (Figure 1) and a left proximal humerus fracture (Figure 2).

## Discussion

SE could be the first presentation of epilepsy, as seen in our patient. According to many studies, fracture risk in epileptic patients is increased two to six folds<sup>7</sup>. This is because certain antiepileptics increase bone turnover, which reduces bone mineral density and increases the risk of fracture<sup>6</sup>. Accordingly, patients taking long-term antiepileptic treatment should take vitamin D and calcium supplements, especially those with other bone pathologies. Two of the reported cases involved known epileptic patients with osteoporosis and osteomalacia associated with antiepileptic medication<sup>2,3</sup>. There is only one comparable case involving a 28-year-old previously healthy male with normal bone density and no history of syncope. He suddenly lost consciousness and went rigid without convulsions or falling down. The episode resulted in a left shoulder fracture and bilateral femoral fracture<sup>4</sup>. In our case, the patient was previously healthy. He did not have a history of epilepsy. He was not taking any antiepileptic medications. He had no history of osteoporosis, loss of bone density or seizures, except for febrile seizures as a child, which did not require any treatment. Thus, this case study shows that the violent convulsions



**Figure 1:** CT scan showing bilateral acetabular fractures of the hip bone (front view).



**Figure 2:** X-ray of left shoulder showing fracture of left proximal humerus.

in status epilepticus can cause severe fractures in otherwise healthy individuals.

Pearson and Hargadon described the mechanism for hip fractures due to convulsion in 1962<sup>8</sup> followed by Remec and Evarts in 1983<sup>9</sup>. The fractures are caused by violent contractions of the peri-articular muscles, in particular the pelvic-trochanteric muscles during the seizure. The mechanism of posterior shoulder fracture-dislocation was described by Shaw in 1971<sup>5</sup>. The humeral head is moved posteriorly and superiorly by the disproportionate contraction of the stronger internal rotator and weaker external rotator muscles during seizure activity resulting in dislocation of the joint. Persistent force against the glenoid rim results in fracture of the humeral head with possible comminution<sup>5</sup>.

Nehme et al. reported 27 cases of acetabular fractures resulting from various seizure attacks in the literature from 1970 to 2007. Late diagnosis of central acetabular fractures may lead to sudden death due to massive blood loss. The mortality rate of such fractures in all reported cases is 18.5%<sup>10</sup>. Thus, it is important to promptly diagnose hip and shoulder dislocations or fractures to prevent osteonecrosis of the humeral or femoral head and ensure satisfactory joint functional recovery. Unreduced posterior dislocation of the shoulder is difficult to treat and a delayed diagnosis of dislocation or fracture-dislocation may carry the risk of non-union, future humeral head collapse, avascular necrosis, post-traumatic arthritis and muscle necrosis<sup>11</sup>.

### Suggestions and conclusion

Although fracture dislocation of the shoulder or the hip caused by status epilepticus is a rare phenomenon, it is important not to underestimate the forces that exist in such seizures. When accessing patients who had seizures, physicians should be aware of possible fracture-dislocations, and ask patients if they have any shoulder or hip pain. An axillary X-ray or a CT scan of the shoulder or the hip can be a useful diagnostic tool if indicated. It is also important to note that patients of Northern European origin and post-menopausal women are known to be at a greater risk for osteoporosis and fractures.<sup>12</sup>

Clinicians should be especially cautious when ruling out fractures in SE patients who have risk factors for decreased bone density such as osteoporosis, osteomalacia, prolonged vitamin D deficiency, and long-term use of any antiepileptic medication known to affect bone density.

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