

# Orthopaedic Surgeons Diagnosing Epilepsy from Plain Radiographs

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## Abstract

We present the case of a young, healthy male who suffered two isolated, nocturnal seizures thirteen years apart. During the first seizure, he sustained wedge fractures to his sixth, seventh and eighth thoracic vertebral bodies. During the second seizure, he sustained bilateral posterior shoulder fracture dislocations.

We review the literature and outline the importance of considering nocturnal seizures as a mechanism of injury when there is no other cause apparent.

## CASE REPORT

A 42 year-old man was asleep in bed when his wife heard a disturbance from the bedroom. On entering she observed him lying drowsy in bed. He presented to the emergency department with pain and decreased range of movement in both shoulders. He was fully conscious but had no recollection of the events earlier that evening.

His past medical history included well controlled type 1 diabetes mellitus – his blood sugar immediately postictal was recorded by his wife as 6.7 mmol/L.

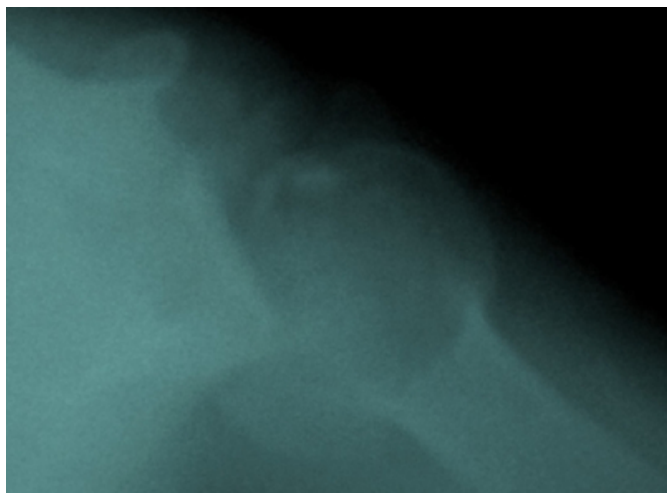
Clinically he had tenderness to both shoulders and severely restricted range of movements. Radiological assessment confirmed that he had sustained a bilateral posterior fracture dislocation of the shoulders.

## Figure 1

Radiographs 1 and 2: Right and Left Shoulder Axial Views



**Figure 2**



His only other significant medical history was at 29 years of age (13 years previously) he had suffered a nocturnal seizure – following which he presented the emergency department with back pain and compression fractures of the mid-thoracic spine – at T6, T7 and T8 – a recent radiograph of this injury is shown in Fig 1. There was no associated neurology and all were stable fractures. He then had no further seizures until that described above.

**Figure 3**

Radiograph 3: Lateral Thoracic Spine



A referral to the neurology team was made and a diagnosis of nocturnal seizures associated with idiopathic epilepsy was made.

## **DISCUSSION**

It is well known that epileptic seizures may be associated with fractures and dislocations either owing to trauma associated with the seizure, or indeed, owing to the mechanism of the seizure itself.

Bilateral posterior fracture dislocations are very rare and have been reported only 30 times in the literature. Vertebral fractures are more common and it has been suggested that up to 15% of patients with convulsive seizures but no history of back pain have vertebral compression fractures (1). Such a collection of orthopaedic injuries in a patient with so few seizures has never been reported.

Posterior shoulder dislocations are uncommon, accounting for just 2 – 4% of shoulder dislocations, and posterior fracture dislocations represent less than 1% of all shoulder fractures. These dislocations are most commonly associated

with epileptic seizures, electroconvulsive therapy and electric shocks and are more common in men (3). Indeed it is commonly accepted that if a patient presents with a posterior shoulder dislocation, without a history of electric shock, a seizure must be considered to have been the cause and hence due consideration given to an intracranial pathology.

Vertebral compression fractures are well-documented complications of convulsive seizures. They are more likely to occur in adults, those with nocturnal convulsive seizures and most significantly men – there is a 3:1 male-female ratio (3). During a seizure the posterior spinous and abdominal muscles tense to cause axial loading and a flexion force which typically cause compression fractures. These frequently occur at the mid-thoracic level as opposed to the thoracolumbar predisposition associated with trauma (4).

There have also been numerous reports throughout the literature of the underlying seizure not being the presenting complaint – often because it is an unwitnessed nocturnal seizure. The presenting complaint in these individuals is therefore atraumatic shoulder or back pain. The absence of any history can cause a delay in diagnosis, with reports of patients having been treated for cardiac chest pain and frozen shoulders (5). The nature of the fractures may also lead to unnecessary investigations to exclude more sinister pathology such as metastases – either because of the lack of a clear history of trauma or because of an underestimation of

the force of muscle contractions that can occur during a seizure.

### CONCLUSION

Epileptic seizures produce a variety of characteristic fractures or dislocations without a clear history of trauma – especially in the case of an unwitnessed nocturnal seizure. Posterior shoulder dislocations, without history of electrocution, are virtually pathognomic of a seizure. An underlying seizure tendency should be considered in unexplained injuries presenting to the emergency department.

### CONFLICTING INTERESTS

Both authors confirm that there are no conflicting interests.

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