CASE REPORT

Acetabular fracture secondary to a cardiac arrest induced seizure: A case report and review of literature

Shafic A. Sraj*, Nadim Afeiche, Suhayl Lakkis

Division of Orthopedic Surgery, Department of Surgery, American University of Beirut Medical Center, Lebanon

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Introduction

Non-traumatic acetabular fractures are rare injuries. They require forceful muscle contractions usually in the context of a tonic–clonic seizure and commonly in the presence of osteoporotic bone. A systematic review of the literature did not report any such injury in the context of a cardiac event. We present a case where an otherwise healthy patient developed a witnessed cardiac arrest in the emergency department complicated by a seizure, and resulting in an acetabular fracture.

Case report

A 75-year-old male patient presented walking to the emergency department complaining of chest pain. Electrocardiography revealed a myocardial infarction, and he was started on thrombolytic therapy. Ten minutes later, the patient developed a severe generalised tonic-clonic seizure and was found to be in ventricular fibrillation. He was immediately cardioverted and reverted to sinus rhythm. He was maintained on Amiodarone. Ninety minutes after presentation, there was no evidence of reperfusion, so he was admitted to the cardiac care unit and underwent angioplasty and stenting.

Following his resuscitation the patient complained of left sided pelvic pain. CT of the abdomen and pelvis revealed a comminuted fracture of the left iliac bone involving the anterior and posterior columns of the acetabulum and left superior pubic ramus (Figs. 1 and 2). This was associated with an extensive haematoma in the gluteal muscles and left psoas muscle. He had dropped his haemoglobin from 15.2 to 9.9 overnight. The fracture was in an acceptable position with no intra-articular fragment seen. The orthopaedic team was consulted and patient had skin traction with 7-lb weight applied to the left leg. The patient recovered from his cardiac complications and was kept in traction for a total of 6 weeks. Witnesses including the resuscitation team and family members denied any fall or direct trauma.

Discussion

Fractures associated with cardiac arrest or arrhythmias have been reported only in relation to
cardiopulmonary resuscitation efforts. The most common are rib (29%), and sternal fractures (14%). One case of vertebral fracture following direct current electric shock for ventricular fibrillation was reported in 1987.

Seizures, however, are commonly associated with musculoskeletal injuries, including fractures and dislocations. Forces generated during a tonic–clonic seizure may result in musculoskeletal sequelae, be it in the axial skeleton, such as thoracic and lumbar vertebral fractures, or any of the major joints, such as the shoulder and the hip. In patients admitted to a hospital with a diagnosis of seizure, 1.1% developed fractures, 0.3% of which were as a consequence of convulsive seizures without direct trauma. Some of the most common injuries include vertebral compression fractures, posterior shoulder dislocation or fracture-dislocation, and femoral fractures.

Musculoskeletal injuries occurring in the absence of direct trauma has been attributed to unwitnessed seizures. Aboukas and Smith hypothesized that acute vertebral fractures of an unclear cause — often labelled idiopathic — may be due to unwitnessed epileptic seizures. The same applies to posterior shoulder fractures and/or dislocations. Finelli and Cardi considered fractures and/or dislocations of the hip in the absence of trauma to be strongly suggestive of a seizure activity.

An acetabular fracture has been reported as a rare complication of tonic–clonic seizures. It has been ascribed to excessive uncontrolled muscle contractions around the hip and femur, which can force the head of the femur in a cranio-medial direction against the acetabular floor. This can lead to a fracture of the acetabulum, especially in association with osteoporotic bone. Substantial internal haemorrhage is a critical and common complication of pelvic fractures, particularly in patients on anticoagulant therapy. Van Heest et al. reported a patient with bilateral central acetabular fracture-dislocation secondary to a sustained myoclonus. The mechanism of injury is similar to other uncontrolled muscular contractions. Before the 1970s, these were induced during electroconvulsive therapy that used to carry a high risk of fractures and dislocations before better anaesthesia eliminated these injuries.

Hughes and O’Briain reviewed 20 reported cases of central fracture-dislocations of the hip occurring because of seizure activity. The causes of the seizure included inflammatory conditions, brain pathology, eclampsia, metabolic disturbances, iatrogenic causes, or epilepsy. None of the seizures was related to cardiac pathology. Prior bone disease (including metastasis and osteopenia/osteoporosis) was noted in eight patients. The most serious complication of these fractures was shock or marked hypotension, especially in patients on anticoagulants.

Given the powerful contractions that occur with convulsions, musculoskeletal pain following seizures should not be dismissed until fractures or dislocations have been ruled out even if the patient is able to ambulate. The forces of the muscle contractions generated during a seizure are not to be underestimated.

To our knowledge, no case has been described where a cardiac arrest and a concomitant seizure led to an acetabular fracture. Conspicuous motor activity may accompany syncope due to malignant ventricular arrhythmias and complicate the clinical
distinction of syncope from seizures. One case was described in which simultaneous ambulatory electroencephalography and electrocardiography monitoring revealed periods of asystole coinciding with epileptic seizures. The seizure activity was not altered by pacemaker correction of the cardiac arrhythmias.

Conclusion

Non-traumatic acetabular fractures and central fracture-dislocations are rare injuries that require a high index of suspicion. They are frequently attributed to a seizure activity and are commonly missed until the primary disease has been controlled. Musculoskeletal complaints in the setting of seizure activity should not be dismissed and warrant active investigation.

References