

SEIZURE-INDUCED MULTIPLE LEVEL THORACIC BURST FRACTURE

A Case Report

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ABSTRACT

Vertebral fractures are the most common skeletal injuries in patients with musculoskeletal problems caused by generalized tonic-clonic seizure. The fracture pattern is generally in benign nature. Diagnosis of the extent of the fractures caused by generalized tonic-clonic seizures is difficult by means of plain radiographs or CT. In some cases, especially in contiguous multiple level fractures, routine radiographic evaluation may be inadequate and MRI studies may be necessary in planning the proper treatment method.

Key Words: Seizure, Burst fracture

ÖZET

KONVÜLSİYONA BAĞLI ÇOK SEVİYELİ TORASİK PATLAMA KIRIĞI

Vertebra kırıkları, jeneralize tonik klonik nöbetlerin neden olduğu iskelet sistemi sorunu bulunan hastalarda en sık görülen yaralanmalardır. Bu kırıklar genellikle benign özelliktedirler. Jeneralize tonik klonik nöbetlerin neden olduğu bu kırıkların direkt radyografi ve bilgisayarlı tomografi ile tanısı zor olabilmektedir. Bazı vakalarda, özellikle çok seviyeli kırıklarda rutin radyografik değerlendirme yetersiz olabilir ve manyetik rezonans görüntüleme çalışmaları, tedavi metodunun seçilmesinde gerekebilir.

Anahtar sözcükler : Epilepsi nöbeti, Patlama kırığı

Fractures or dislocations caused by generalized tonic-clonic seizures are encountered in various sites of the musculoskeletal system including vertebral bodies (4,5), shoulder joint and humeral head (2,3), femoral neck (5,7), hip joint and pelvis (5) and skull (2). Diagnosis with plain radiograms is usually difficult to interpret, so CT scan is advocated especially for the compression fractures of the spine (1).

Here we present a case with seizure-induced contiguous T9, T10 and T11 vertebral compression fractures with the extent of the injury could not be detected by plain radiographs or computed tomography (CT), but magnetic resonance imaging (MRI).

Case: A 51 year-old man admitted to our department with complaints of back pain, initiated

following tonic-clonic seizures occurred while sitting three weeks ago. He had no history of seizures or neurological disease before. Physical examination revealed mild kyphotic posture and point tenderness at the midline of lower thoracic region. The patient had no neurologic complaints.

He had admitted to another hospital and compression fracture of the T9 vertebra as well as the irregularity of the superior end-plate of T10 vertebra had been diagnosed (Figure 1).

Further CT scans had displayed compression fracture and minimally displaced rectangular bone fragment at the anterior part of the superior end-plate of T9 (Figure 2). CT imaging of the adjacent vertebrae of T9 were normal.

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Figure 1. Lateral radiograph of the patient, indicating the compression fracture of the T9 vertebra. Irregularity of the superior endplates of T10 vertebra can be seen.

MRI examination revealed reparative changes secondary to diffuse interosseous bleeding with oedematous tissue swelling like bone bruising, in addition to compression fractures at T9, T10 and T11 (Figure 3).

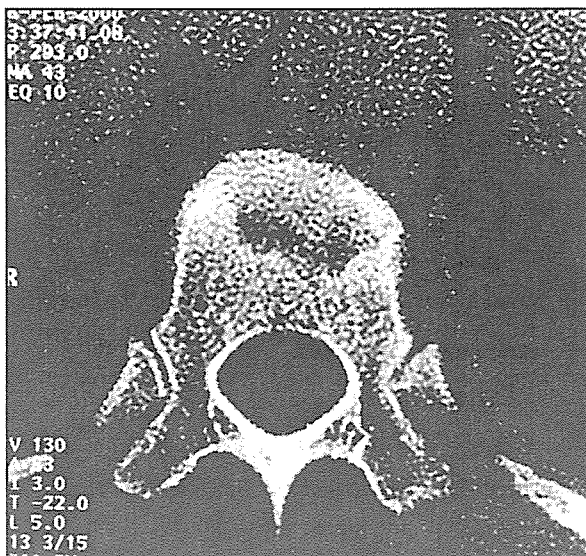


Figure 2. Anterior compression fracture of the T9 vertebra is detected by CT imaging. Note the minimally displaced rectangular bone fragment.

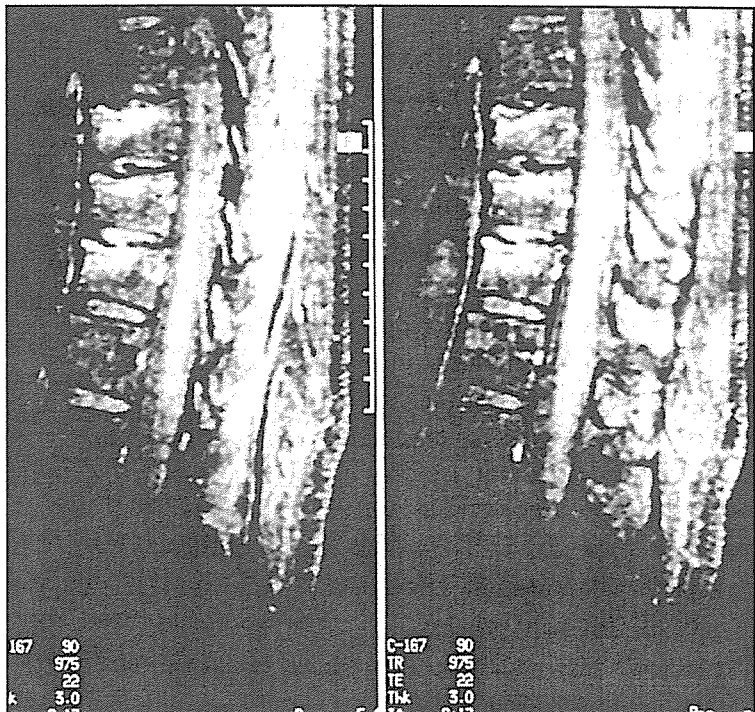


Figure 3. Sagittal plane MRI image shows oedematous tissue swelling like bone bruising and compression fracture at T9, T10 and T11 vertebrae.

Then, hyperextension brace was started and he became pain free after three weeks. The brace treatment was discontinued after three months and rehabilitation program was performed. The patient was asymptomatic at one-year follow-up examination.

DISCUSSION

Vertebral fractures are well-known complications of seizures and can arise from paravertebral muscular contraction or direct trauma because of fall in the standing position(2). The incidence of injuries related to convulsions of any cause has rarely been reported, although vertebral compression fractures are considered to be the most common skeletal injury(4). During seizure, the spine flexes forward due to paraspinal and abdominal muscle contraction. The forces created by muscular activity are loaded at anterior column especially in the mid-thoracic region.

Kelly(5) studied 2200 patients with 37000 induced convulsions, and found that the incidence of vertebral fractures is about 1 percent. The most common sites

of vertebral fractures were T4-T7, and fractures below T7 were uncommon. The fracture usually shows a depression of the superior surface of the vertebral body, and lateral graphies are reported to be more valuable for diagnosis.

Mc Cullen and Brown(6) reported a case of a thoracic burst fracture and bilateral proximal humerus fracture secondary to a seizure, and stressed that the asymptomatic nature of the vertebral fractures for a time follows the injury. Patients frequently are unable to define the injured zone because of altered mental status or because of distraction by second locus of pain. They proposed that, patients who present after seizure with no overt signs of trauma, the shoulder, pelvic girdles and thoracic spine should be closely examined by screening roentgenograms.

It is not always possible to interpret the details of the fracture accurately by plain radiographs. Ballock et al.(1) reported that about 25 percent of patients would have had an incorrect diagnosis based on evaluation of plain radiographs alone. Disruption of the posterior cortical line, although a useful sign when present, is not often visible on plain radiographs. Authors stated that, routine CT scans of the spine are valuable for thoracic and lumbar vertebral fractures.

In the present case, T9 compression fracture is diagnosed with plain radiographs. Although CT scan gave more information and revealed fracture of T9 vertebra, it was in benign nature. On the other hand, MRI studies displayed a more aggressive treatment. As a result, we conclude that plain radiographs and CT scan may not always be adequate in the evaluation of the patients with such injuries and MRI studies should be utilized especially for the patients with suspicious of multilevel injuries in order to initiate proper treatment.

REFERENCES

1. Ballock BT, Mackersie R, Abitbol JJ, Cervilla V, Resnick D, Garfin SR: Can burst fractures be predicted from plain radiographs? J Bone Joint Surg (Br) 74 (1): 147-150, 1992
2. Finelli PF, Cardi JK: Seizure as a cause of fracture. Neurology 39:858-860, 1989
3. Goldman A, Sherman O, Price A, Minkoff J: Posterior fracture dislocation of the shoulder with biceps tendon interposition. J Trauma 27(9): 1083-1086, 1987
4. Hepburn DA, Steel JM, Frier BM: Hypoglycemic convulsions cause serious musculoskeletal injuries in patients with IDDM. Diabetes Care 12(1): 32-34, 1989
5. Kelly JP: Fractures complicating electroconvulsive therapy and chronic epilepsy. J Bone Joint Surg (Br) 36(1): 70-79, 1954
6. McCullen GM, Brown CC: Seizure-Induced thoracic burst fractures. Spine 19(1): 77-79, 1994
7. Shaheen MA, Sabet NA: Bilateral simultaneous fracture of the femoral neck following electrical shock. Injury 16: 13-14, 1984

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