CASE REPORT

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Fractures due to hypocalcemic convulsion

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Abstract We report on two cases of patients in whom hypocalcemic seizures during hemodialysis led to right scapular body fracture in one and bilateral femoral neck fractures in the other.

Résumé Nous présentons deux cas, chez les quelles on a rencontrés une fracture de l'omoplate dans l'un, et une fracture des cols femoraux bilatéraux dans l'autre, à cause des convulsions hypocalcémiques pendant l'hémodialyse.

Introduction

Renal osteodystrophy is a well-recognized complication of chronic renal insufficiency and long-term hemodialysis treatment. While the mechanism causing this progressive bone disease is complex, the histologic result is osteitis fibrosa cystica and/or osteomalacia manifested clinically in itching, bone pain, weakness, muscle wasting, metastatic calcification and a tendency towards pathologic fractures. Rib fractures with little or no trauma are highly suggestive of this disorder in patients with chronic renal failure [1].

Convulsions may occur secondary to (among other causes) alterations in calcium and magnesium metabolism and complicate the picture by leading to fractures in

different parts of the skeleton. This paper presents two cases with very unusual fractures caused by hypocalcemic convulsions during hemodialysis.

Case reports

Case 1

A 29-year-old man was seen to develop tonic and clonic seizures during a regular hemodialysis session. He had chronic renal insufficiency secondary to urolithiasis and had been on hemodialysis treatment since 1986.

His seizures were stopped with intravenous calcium gluconate and diazepam. Soon after cessation of the convulsions, the patient complained of severe pain in his right shoulder. Plain radiograms demonstrated a transverse fracture line through the right scapular body (Fig. 1). The patient was given local ice and a sling to immobilize the shoulder and was treated symptomatically.

Case 2

A 37-year-old man developed generalized tonic-clonic convulsions during his third hemodialysis session. Since 1980 he had been followed up as an out-patient because of chronic renal failure secondary to chronic glomerulonephritis.

His convulsions were treated with intravenous calcium gluconate and diazepam. Initial clinical examination was unrevealing except for a slight pain in both hips. The following day, the patient complained of severe bilateral hip pain and inability to walk. Pelvic roentgenograms showed bilateral femoral neck fractures (Fig. 2). Reconstruction with endoprosthesis was performed on the left side. One week later, the same procedure was planned for the right hip. However, progression of the patient's cirrhosis contraindicated general anesthesia.

Discussion

Patients on hemodialysis treatment may experience convulsions due to a number of conditions among which hypovolemia-induced transient hypotension is the most frequent [2]. Although electrolyte disturbances may occur, hypocalcemia is not common in these patients owing to

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Fig. 1 Plain radiogram showing a transverse fracture line through the right scapular body

Fig. 2 Pelvic radiogram showing bilateral fractures of the femoral neck

the elevated serum parathyroid hormone (PTH) and oral calcium supplementation. However, when this mechanism fails or the patient does not comply with the therapy hypocalcemia ensues and may lead to convulsions. In both of our cases, low levels of serum calcium, disap-

pearance of seizures following intravenous calcium gluconate and the patients' histories of noncompliance with dietary and therapeutic regimens indicate hypocalcemia as the cause of convulsions.

In patients with renal osteodystrophy, fractures of ribs, patellae and vertebral bodies are relatively common [4]. Fractures of the scapula and the femoral neck however are rare. We could find only three cases of scapular fractures resulting from seizures in patients with renal osteodystrophy. Peraino et al. [3] reported the first case in 1977 and Mathews et al. [2] reported the other two in 1983.

The femoral neck is another rare location of fracture in renal osteodystrophy. In the literature, we have found only one case of bilateral femoral neck fractures resulting from renal-failure-induced hypocalcemic convulsions [5]. It occurred in a 22-year-old woman with a history of acute glomerulonephritis diagnosed 10 years earlier. Besides the fractures of both femoral necks, a superior pubic ramus fracture was also present. Our second case had isolated fractures of both femoral necks and seemed to be the second reported case in a patient with renal osteodystrophy.

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