BMJ Case Reports

Myth exploded

Spontaneous bilateral neck of femur fractures and shoulder dislocation

Khurram Siddique, Lambros Athanatos, Philip Housden

Department of Trauma and Orthopaedics, East Kent Hospitals NHS Trust, Ashford, UK

Correspondence to Khurram Siddique, khurram.siddique@doctors.net.uk

Summary

Non-traumatic fractures mostly present a diagnostic dilemma. Fracture risk is less reported in non-epileptic seizures. Various metabolic conditions leading to a decrease in bone mineral density may also cause fractures. The authors report the case of non-traumatic fracture of an old woman who presented with fever, shortness of breath and right shoulder pain without any history of epilepsy. Episode of seizures was noted prior to admission. The patient had poorly controlled diabetes mellitus and severe hypoglycaemia was noted at the time of admission. She was admitted to a medical ward for a severe chest infection. Non-traumatic fracture dislocation of the right shoulder was also noted upon admission and treated conservatively. Bilateral hip fractures were not diagnosed till the fourth day. Patient had multiple comorbidities making the management very difficult. Here the authors will discuss the possible aetiology of this pattern of pathologies and the multidisciplinary management of such a rare case in detail.

BACKGROUND

A number of aetiologies causing multiple fractures have been described with trauma being at the top but such a combination of multiple non-traumatic fractures in the absence of trauma, fall or epilepsy has not been described.

CASE PRESENTATION

Introduction

Hip fractures are common source of morbidity in the ageing population. More than 80 000 patients in the UK sustain proximal hip fracture each year. Literature review suggests that the risk of fracture is two to six times higher in epileptic patients because of repeated seizures and osteopaenia due to the use of antiepileptic drugs (AEDs).[1] A multitude of pathologies like osteoporosis, metastatic bone tumours, hyperparathyroidism, epilepsy, Paget's disease as well as cognitive and instability disorders can also increase the risk.[2] The detailed history is crucial for clarifying the aetiology, management planning and in determining the prognosis.

Case report

An 83-year-old lady resident of a care home, with long-standing history of poorly controlled diabetes mellitus, presented with productive cough, severe pain and inability to move her right shoulder. History of spontaneous coarse tremors of her upper body and audible click without any fall or trauma was reported by her carer after which the shoulder pain started. Her mobility was limited to a few steps with a Zimmer frame prior to this episode. She was on medication for ischaemia heart disease, hypertension, dementia and oral hypoglycaemics for diabetes. She neither had increased hip pain, nor any drastic changes were noted in her mobility; over the last few months suggestive of any recent fractures. No history of previous falls, stroke, epilepsy or syncope was reported.

Examination revealed that the patient was tachycardic and had bilateral coarse crepitations. Her right shoulder was drooping, tender on palpation and movements were painful. Laboratory investigations showed hypoglycaemia (blood glucose 2.9 mmol/l), which was treated with parenteral glucose, raised white cell count and C reactive protein while normal kidney and liver functions. Radiographs of the right shoulder revealed comminuted humeral head fracture with anterior dislocation (figure 1). Management involved delaying any surgical intervention till she was clinically stable after telephonic advice from orthopaedic surgeons. Antibiotics were commenced to treat chest infection.

On the fourth postadmission day, the patient had severe pain in both hips while being helped by the physiotherapists to mobilise. Urgent pelvic radiographs were taken which revealed the bilateral displaced subcapital femoral neck fractures (figure 2).

Patient was then transferred to the orthopaedic centre for subsequent management. On day 5, patient was put on the 'Liverpool care pathway for the dying patient' due to her poor condition. Regular re-evaluation showed that the patient improved clinically, but still had severe hip pain. The Nottingham hip fracture scoring scale was utilised to make decisions about any intervention. The case was discussed in the multidisciplinary team meeting involving the orthopaedic, medical, anaesthetic teams and the medical staffs. The option of cemented prosthesis was rejected owing to the risks associated and patient's poor general condition. Our patient subsequently underwent bilateral Girdlestone operation (excision arthroplasty) and a failed closed manipulation of her right shoulder on the 10th postadmission day (figure 3).

Detailed investigations showed normal levels of parathyroid hormone, vitamin D, thyroid-stimulating hormone, vitamin B_{12} and folate levels. Only calcium levels were

Figure 1 Radiograph of the shoulder after seizure showing the comminuted fracture dislocation.

noted to be low (1.9 mmol/l). Her brain CT scan was also normal. Histology of the femoral head showed trabecular destruction surrounded by fracture callus and granulation tissue. Trabeculae were generally narrow and exhibited findings indicative of osteoporosis and no malignant cells were seen.

OUTCOME AND FOLLOW-UP

Our patient made a slow recovery and on day 40, she was discharged to a nursing home capable of eating and drinking on her own and ability to sit up without much pain but with very little expectation of walking.

DISCUSSION

We have reported the management of a patient with multiple fractures following history of tremors without any trauma or fall. Literature review identified a number of aetiologies causing multiple fractures, with trauma being at the top but such a combination of multiple non-traumatic fractures as in the present case have never been reported.

BMJ Case Reports 2011; doi:10.1136/bcr.05.2010.3034

Figure 2 Pelvic radiograph after seizure showing the bilateral displaced subcapital femoral neck fractures.

A high risk of fractures has been reported among the epileptic patients. One of the series has shown that the risk to be as high as 43%.[3] A multitude of fractures and dislocations including that of skull, vertebrae, shoulders and the hips can be caused by epileptic seizures. Number of studies have shown that the increased fracture risk is caused due to reduced physical activity and the use of AEDs (which induce the P-450 enzyme system).[4] Both of these factors reduce the bone mineral density and hence increase the fracture risk. Our patient did have seizures immediately before presentation but neither she had epilepsy nor she was on AEDs.

The non-epileptic seizures causing multiple fractures reported in our case are unusual. One possible cause could be severe hypoglycaemia. The evidence to support this statement comes from the study which reports seizures in 4.7% of all the hospitalised patients admitted with hypoglycaemia.[5] The possibility of strong muscular contractions, produced during seizures could also account for multiple fractures as shown in one study.[6]

We found no indications of other conditions causing reduced bone strength and increased fracture risk including hyperparathyroidism, calcitonin deficiency, metastatic fractures and AED induced decreased calcium absorption in the intestine. All of these conditions were excluded after detailed investigations in our patient.

Literature search showed that diabetes mellitus is a significant risk factor for osteoporosis and increased fracture risk in old patients.[7] This association has been proved by prospective studies especially in the older patients.[8] The radiological examination did show evidence of osteopaenia in our patient which was supported by low levels of serum calcium. However, it must be emphasised that despite the low calcium levels our patient had normal levels of parathormone and vitamin D. Another likely possibility in our patient could be 'atraumatic stress fractures' owing to the bone weakness.

Non-accidental injury (NAI), which has been shown to contribute significantly to such fractures, was also considered. A multidisciplinary team approach including the assessment of patient, carers and family members was undertaken but again no evidence suggestive of non-accidental injury was found.

Girdlestone procedure has been used to treat fractures of medically suboptimal and functionally compromised patients.[9] Considering the patient's general condition (patient was deemed unfit for prolonged procedure; mortality risk >50%) and to achieve the best outcome, bilateral Girdlestone procedure was performed. This procedure not only controlled her pain but is also associated with less risk of complications than those associated with cemented arthroplasty especially in the older patients.

Late diagnosis of orthopaedic injuries in patients is a matter of great concern as it may lead to permanent disability.[10] Only a high index of suspicion can prevent missing such fractures. We have also been unable to find similar combination of fractures in the literature.

CONCLUSIONS

Older patients with unknown mechanism of injury should be thoroughly investigated to look for the underlying aetiology. Treatment options should be tailored depending upon the individual patient to achieve the

Figure 3 Postoperative radiograph showing right hip after girdle stone operation.

best outcome. Patients on Liverpool care pathway should always be re-assessed as it does not replace a treatment plan.

Learning points

- Very sick older patients with poor communication, necessitate a thorough clinical examination.
- A low threshold should be kept for radiographs, especially of pelvis, hips, lower back and shoulders in patients presenting with unknown mechanism of injury.
- Adopting the safest treatment option depending upon individual patient yields the best outcome.
- Excision arthroplasty may be performed in the very frail older patients where neither internal fixation nor arthroplasty is advisable, and may be expected to give pain relief, but limited function.

Competing interests None.

Patient consent Obtained.

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