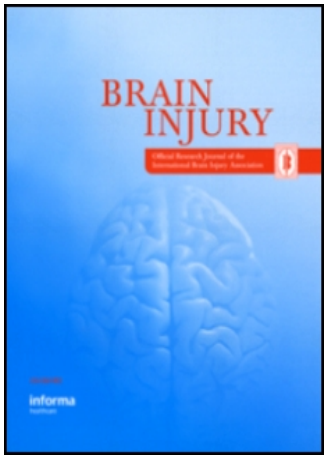

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CASE STUDY

Bone fractures in the long-term care of a patient in a vegetative state: A risk to conflicts

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Abstract

Purpose: This case report shows how recurrent bone fractures can increase the tension in the relationship between family and caregivers in the long-term care of a patient in a vegetative state (VS). The aim of this report is to prevent conflict situations elsewhere by informing the family in time about the risk of fractures in a situation of severe osteoporosis.

Results: A second opinion and a density test of the bone contributed to the acceptance of the family of that risk in the daily nursing care, after all adjustments to prevent fractures and to adapt the environment were undertaken.

Conclusions: The registration of immobility and the risk of fractures in the problem list is recommended, particularly in the emotional context of the long-term care of a vegetative state. This should be part of the multidisciplinary care plan, in which regular evaluations and communication with family are essential.

Keywords: *Vegetative state, bone fracture, long-term care, nursing home*

Introduction

Patients in a vegetative state (VS) have not regained consciousness after an acute brain accident of traumatic or non-traumatic origin. In contrast to coma patients, however, they open their eyes and show a sleep–wake cycle; they are 'awake, but not aware' [1].

During the past years, the fate of such patients and conflicts about decision-making draw world-wide media attention, particularly after the involvement of the president of the USA in the case of Terri Schiavo in 2005 [2]. However, data on the medical course and decision-making in the long-term perspective of VS is still scarce. An insight was published in this journal, including an overview of the complications of five VS-patients in the long-term care in a nursing home [3].

In the stabilized long-term phase of a VS, when there is no hope of recovery of consciousness, it is difficult for families to fully adjust to the situation. Tension and conflicts in the relationship with caregivers about medical treatment and care are known [4–6]. In this emotional context, complications of VS can increase the tension, particularly when caregivers lack the knowledge and experience to prepare the relatives. When knowledge of the long-term problems is still scarce and the prevalence of VS is too low to achieve enough experience, it is necessary to publish case studies to gain insight. It is for that reason that one previously discussed the ophthalmologic

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complication *filamentary keratopathy* as a chronic cause of concern for family and caregivers [7].

This current article focuses on another complication that can cause a conflict between relatives and caregivers in the long-term care. Extreme spasticity, contractures, myoclonus and heterotopic ossification are well described as neuro-orthopaedic complications of VS [3, 8–10]. Bone fractures, however, are mainly known in the acute phase of coma after traumatic brain accidents. Because recurrent bone fractures in the long-term care have not been described before, a case report is presented to highlight the problems and to supply lessons for preventing conflicts elsewhere.

Case report

In 2006, patient A was a 38-year-old man who has survived a period of 19 years in a vegetative state after a traffic accident in 1987. The medical events and the decision-making process until 2002 were previously described in this journal [3].

In the first years, he received physiotherapy to prevent muscle contractures. Despite spasticity, he has only slight contractures, particularly of his feet. Treatment interventions consisted of passive muscle stretch and bed and wheelchair positioning. The patient was turned every 4 hours in bed, alternating on the back, left and right side. Because of this, bedsores occurred very rarely. He was mobilized in a wheelchair that supported his body and head for 6 hours a day. Transfers from his bed to the wheelchair and in the bathroom were done by two nurses and a mobile lift. Cortisone was prescribed daily as replacement therapy because of pituitary dysfunction after the brain accident.

His parents visited him daily and were intensively involved in the care for him. After active physiotherapy was discontinued and maintenance exercises only were felt to be appropriate, they took over the passive flexion-extension movements of his joints daily. They adapted their car and their house to care for him at home every weekend. When there was acceptance by the family that no recovery was possible, tension arose between the caregivers and the family about what would be optimal treatment and care in his situation. The physicians considered artificial nutrition and hydration as futile medical treatment, but the proposal of withdrawing was not acceptable to the parents.

In a weekend in October 2001, the family discovered at home a swollen, blue left ankle. An incident was not reported. In the nursing records, a seizure was described 13 days earlier, after which a period of fever was registered due to infections of the respiratory and urinary tract.

An X-ray in the hospital showed a lateral fracture of the distal tibia with a good position in a lime-deficient skeleton. The orthopaedist on duty told the family that force to the bone had to be applied to cause such a fracture. He doubted the role of osteoporosis. The therapy was a plaster cast of the lower leg for 6 weeks.

The family was upset and accused the nursing staff of an unreported accident in the daily care. The head of the ward interviewed every team member who had cared for the patient in the days before, but no accident was reported. The family persisted in an external cause as origin of the fracture and accused a nurse. To diminish the tension and to provide clarity concerning the influence of internal factors, a second opinion about the influence of osteoporosis was proposed and accepted a few weeks later. After discussing the case with the permanent orthopaedist consultant of the nursing home, an independent orthopaedist of another hospital was consulted. The question was whether the condition of the skeleton, the degree of osteoporosis, could have increased the risk of the fracture.

The second orthopaedist concluded on the basis of the X-rays that a relatively small trauma of this osteoporotic bone, such as during an epileptic seizure, could have caused a fracture. Seizures were reported in the months before and after the fracture.

Measures to prevent new fractures were undertaken. An occupational therapist padded the bedsides and removed the foot of the bed. Transfers and turning were only performed by lifting the patient at his shoulders and hip. The incident caused a crisis in the relationship of the family and the caregivers at the time, in which the management was intensively involved. However, a transfer to another ward was not an option for the family. Anti-epileptic agents were prescribed for 11 weeks. At the request of the family, they were withdrawn because of side effects.

In July 2003, the same manifestation in his left ankle was reported by the nursing staff. Again all nursing moments before the report were analysed, without discovering an incident. A seizure was reported the night before and the patient was showered without problems in the morning.

The X-ray showed a distal fibula fracture and a plaster cast was advised for 1 week. A density test of the bone was performed after discussing the case with the internist consultant. The results are shown in Table I. In his report, the radiologist mentioned an ‘almost extreme low bone density, suitable with very severe osteoporosis’.

A longer bed and shower stretcher were ordered and new advice about the best position and transfers to prevent fractures was given. Bifosphonate 10 mg and vitamin D 400 IE daily was prescribed, along with calcium. The bifosphonate and calcium were

Table I. Results of bone density test.

	BMD	*Z*-score	*T*-score
L2–L4	0.613 g cm^2	−5.19	−5.23
femoral neck	0.537 g cm^2	−3.92	−4.1

According to the radiological report, there is an extreme low bone density, corresponding to a very severe osteoporosis.

withdrawn after a month due to side effects. This time, the results of the bone measurement contributed to the acceptance of the risk of fractures by the family, after all adjustments were undertaken.

Discussion

This report describes recurrent bone fractures as a complication in the long-term course of a vegetative state, which caused tension in the relationship of caregivers and family.

In several contexts, immobility-induced bone loss is well known. Outside immobilization in a medical context, it is described in space travel and even during winter dormancy of bears [11]. However, this phenomenon is not yet documented in the long-term course of a VS. Firstly, this can be explained by a lack of follow-up studies in the long-term care and an estimated mean survival of 2–5 years [12]. Secondly, the prevalence of VS is low, in particular in the Netherlands, as only 32 patients with VS were found in all Dutch nursing homes [13]. Eight of them had survived between 5–10 years and five more than 10 years.

Osteoporosis of the skeletons of these patients can be assumed, because they can only be mobilized in a wheelchair. In the case of this patient, this was objectified by the measurement of an extreme low bone density. Epileptic seizures are known as a cause of fractures [14, 15].

This information proved to be crucial for the caregivers in managing the conflict with the family. They could explain why this patient was at a high risk for bone fractures caused by minimal trauma. The unjust conceptualization of violence to the patient could be refuted by this information in combination with a careful investigation of the circumstances. The second opinion was helpful in supporting the conclusion. The first opinion of the orthopaedist on duty created the tension. To prevent situations of this kind, it is advised that all health professionals involved in the management, including the investigation, communicate with the primary medical staff before giving their opinions. The authors think this is particularly important in the context of the long-term care of a vegetative state, in which different interpretations and expectations of the situation can easily occur.

A realistic conceptualization of the medical situation in the long-term care of patients in a VS is an important condition to guide the family towards the difficult end-of-life decisions [16]. Misrepresentations of coma and recovery in contemporary motion pictures and TV-soaps have recently been described [17,18]. This may contribute to unrealistic expectations. Different opinions about the treatment of the patient, not only in life-threatening circumstances, can be fed by different views about the hope of recovery. More particular, tension between caregivers and relatives may occur when the family requests the continuation of physiotherapy from which the patient will not benefit. They may believe that a recovery of consciousness might be possible if only enough treatment is received [19]. It is important to clearly communicate the goal of treatment to the family and to guide them in the acceptance of the real perspectives. Recovery from a vegetative state becomes unlikely once this state persists longer than 12 months after trauma or 3–6 months in the case of non-traumatic brain damage [12, 20].

In nursing homes, immobility and related complications are major problems. However, it is not always documented as a major problem in medical records, nor adequately evaluated [21]. For patients in a vegetative state, the authors recommend to register immobility as an active problem in the problem list. This guarantees a regular multidisciplinary evaluation of the problem in care plans. One of the goals should be the prevention of fractures, which involves having physicians, nursing staff, physiotherapists and occupational therapists act accordingly. Appropriate actions to achieve this goal include prevention of seizures, adapting the bed and wheelchair with soft materials and advice about optimal transfers and careful care. In case of fractures, bone density assessment is advised to analyse and explain factors that have contributed to the incident. Communication about the risk of fractures with caregivers and family is an important part of the care plan. Information about the risk, supported by bone density assessment, can prepare everyone involved. This can hopefully prevent a conflict situation as described.

In a context where the main grief can never be healed, preventing new sources of distress is the least one can do. The fact that the bone can heal is a small consolation in this respect.

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