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REVIEW ARTICLE

Epidemiology of proximal humerus fractures managed in a trauma center

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KEYWORDS
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Summary Proximal humerus fractures (PHF) are osteoporotic fractures that affect women over 70 years of age. Like fractures of the femoral neck they have become a public health concern. As the population ages there is an increase in the number of people in poor general condition with an increased risk of falls on fragile bones. The incidence of these fractures has increased by 15% per year. All patients managed for PHF in our center in the past year were included in this prospective study (prospective cohort study; level 2). Three hundred and twenty-five patients were included with 329 fractures. There was a ratio of two women to one man. At the final follow-up 50 patients had died (15%) and 25 patients were lost to follow-up. The mean age was 70 years old. There were two types of risk factors. The first was fragile bones, and the second was patient specific risk of falls. The severity of the fracture increased with the age of the population. In the study by Charles S. Neer in 1970, 85% of PHF were not or were only slightly displaced, while this category percentage was only 42% in our study. Hospitalization was necessary in 43% of the cases in our study. Surgical management was necessary in 21%. This lack of relationship between the percentage of displaced fractures (58%) and the percentage of surgically treated fractures is a sign of the difficulties of managing this population, which is usually in poor general condition.

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Introduction

Proximal humerus fractures (PHF) are the seventh most frequent fracture in adults, and the third in patients over 65 following wrist and femoral neck fractures. They represent 5.7% of diagnosed fractures. This is mainly an osteoporotic fracture and its prevalence increases as one moves north in Europe. There is a linear increase in the incidence of this entity after the age of 40. Like fractures of the femoral neck, PHF have become a public health issue (French Law No. 2004-806, August 2004, on public health policy). The ageing population means there is an increase in the number of people poor general condition with a greater risk of falling on weak bones. This regular increase in the prevalence of osteoporotic fractures results in higher medical costs (hospitalization, treatment, convalescence...) and can result in loss of autonomy. The management of these fractures will be a real challenge for future healthcare policies in the upcoming years. Kannus et al. [1,2] studied PHF between 1970 and 1998 in patients over the age of 60 admitted to hospitals in Finland. The number of patients went from 208 fractures in 1970 to 1105 in 1998 or increased by 15% per year. In 28 years and if the ageing of the population is taken into account, this fracture has increased by 166% in women and 250% in men. These fractures will probably become more difficult to treat due to delayed union, an increase in the number of complications and in the rate of pseudarthrosis. Palaven et al. [3] estimated that the number of shoulder fractures would increase three fold in the next 30 years. Court-Brown and Caesar [4] talk about a revolution in the management of fractures because trauma centers were created in the developed countries between 1970—1980 to manage trauma secondary to high-energy traumas, which mainly affect young men. At present, the prevalence of that type of trauma is decreasing while traumas on osteoporotic bone are increasing. The latter are managed differently because the short and long-term aims are different. Lind T et al. [5] noted that in 730 fractures, 29% of the patients needed to be hospitalized; 75% of these were over 60 and only 21% underwent surgery, which represents 583 hospital days per year for a Danish city of 250,000 inhabitants. The aims of the present study were to define the epidemiology of this population presenting a PHF and evaluate the severity of the fracture and its therapeutic management in relation to different subgroups in this population.

Materials and methods

All the patients managed in the emergency unit of Nice University Hospital (CHU Nice) between November 2009 and November 2010 for PHF were included in this prospective study. The initial evaluation included double oblique AP view X-rays of the shoulder and a Lamy view while MRI was requested for more complex fractures. These different imaging techniques were visualized digitally. Initial management of each patient was noted in the medical file (number of days of hospitalization, period of the trauma, surgical procedures, type of immobilization). Each fracture was classified twice by three senior surgeons at 3-month intervals based on the Neer classification [6]. The most frequent response was taken for each fracture. All of the patients were seen for postoperative follow-up in an outpatient consultation at 3 weeks, 6 weeks and 3 months. We contacted all the patients by telephone at 10 months of follow-up. They responded to a medical questionnaire concerning: risk factors (osteoporosis, history of falling, low level of physical activity, hip fracture in the mother, trouble walking, pain in the lower limbs, trouble seeing, trouble hearing, alcoholism, tobacco use), comorbidities (diabetes, epilepsy, depression, dementia, Parkinson's disease, others), the causes of the fracture, medical history in the fractured shoulder, associated traumas, the patient's notion of his/her own general condition on a three point scale (good, average, poor) and the MOS SF12 quality of life score [7]. All of these data were noted on an excel table. This was a prospective cohort study (level 2).

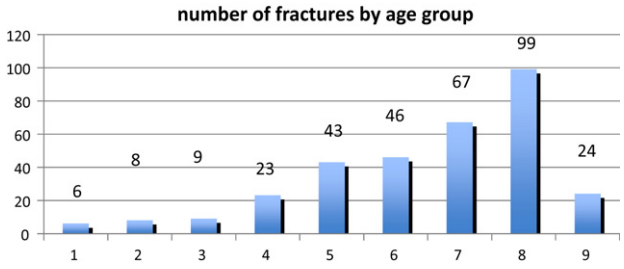

Figure 1 Number of fractures according to age group.

Results

Three hundred and twenty-five patients were included with 329 fractures. The population included 224 women (69%) including three with bilateral fractures and 101 men (31%) one with a bilateral fracture, for a ratio of two women/one man. PHF was associated with another fracture in 34 cases. PHF represented 0.4% of adult emergency room consultations at the CHU Nice (70,000 consultations per year). On a national level, there are 15,500,000 visits to the emergency room per year and an estimated 65,000 isolated PHF per year in France. At the final follow-up, 50 patients had died (15%) and 25 patients were lost to follow-up. Initial data included the entire study population, while at the final follow-up questionnaires were sent to 250 patients with 253 fractures (185 women and 65 men). The mean age was 70 (16—97). The fractured shoulder was on the right side 156 times and on the left side 173 times. The fracture affects the dominant side in 48% of cases. Analysis of the distribution of fractures throughout the year showed that most of these fractures occurred during the ''cold'' season with 60% between October and March. Figs. 1 and 2 show that there is a peak in the prevalence of fractures in patients in their eighties and this is only found in women. The causes of fracture are summarized in Table 1. In men, 55% of the fractures were due to a simple fall and 45% to a high-energy kinetic trauma. In women, the cause was a simple fall in 82% of the cases. The cause of fracture was a high energy trauma in young patients and low energy trauma in older patients, which can be found as of the age of 60 because in 56% of cases it was due to a fall from standing height and this percentage regularly increased until it reached 100% at the age of 100. The risk factors and comorbidities are summarized