

Femoral fractures in the extremely elderly

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Summary

At the Trauma Unit of Pisa we performed an observational study reviewing nineties that about 200 patients were treated and underwent surgery for femoral neck fracture from 1998 to 2005. The clinical and radiographic results obtained were discrete, with a mortality of 42.5%, the survivors are still having a good quality of life.

KEY WORDS: elderly; femoral neck fractures; osteoporosis; morbidity; mortality.

Introduction

Fractures of the femoral neck, both medial and lateral, in the elderly is a major cause of hospital admissions in industrialized countries. These factors are associated with increased mortality and morbidity (1) and a functional impairment that leads the patient not to be more independent at home (2).

Our study re-evaluated about 200 patients over ninety years of age who were treated at our Institution and who underwent surgery for femoral neck fractures from 1998 to 2005. The results obtained were discreet (fairly good) with a mortality rate of 42.5%, while the remaining survivors enjoy a good quality style of life.

Materials of study and Methods

In our work we re-evaluated elderly patients, over ninety years of age, hospitalized for fractures of the femoral neck in the 1st Orthopaedic Clinic of the University of Pisa during the period ranging from January 1st 1998 to the first semester of 2005 and treated with various surgical techniques that included fixation with three cannulated screws for nondisplaced impacted fractures and endomedullary fixation or open reduction procedures for lateral fractures and total hip prostheses implants or bipolar endoprotheses for medial fractures.

We re-evaluated about 200 patients over ninety, of whom 32 were

male and 168 were female, with 110 lateral fractures and 90 medial fractures. Of these 24 patients were treated with three screws, 95 with screw plates, 18 with endoprosthesis, 52 with total hip prosthesis, 11 with endomedullary nail. The female sample was more numerous than the male because female life expectancy is superior to that of males. Italy is the country in which the rate of aging of the population is most intense and quick, as also confirmed by the WHO (World Health Organization). The most recent demographic data confirms the constant increase of the median life expectation of the Italian population which has characterized the last century and which has brought life expectancy at birth in 2001, to 76.7 years for men and 82.9 years for women (Istat data 2001).

The majority of patients suffered from other comorbidities, (such as cardiopathy, diabetes, COPD); most importantly though, during the period of hospitalization their BMD was evaluated with a bone densitometer device which showed that 80% of the women and 40% of the men were affected by osteoporosis.

After the trauma surgery was performed in a time span ranging from a minimum of 24 hours and a maximum of 8 days which were necessary in certain cases to define and stabilize the patient's vital parameters together with the blood coagulation values in order to render anesthesiological and surgical procedures safer.

These patients were subsequently contacted telephonically and were submitted to an evaluative questionnaire regarding the quality of life post operatively and regarding the functionality of the articulation (Harris Hip Score).

42.5% of the patients re-contacted were deceased, of these 28% died of causes correlated to the surgical procedures like being bedridden or afflicted with pressure sores while the other 72% of the deaths are to be associated with concurrent pathologies which afflicted the patients prior to the trauma.

The percentage of deaths in the first 3 months after surgery is of 57% of the patients treated with hip prosthesis (Figure 2), of 80% of the patients treated with endomedullary nails or plates, of 91% of the patients treated with three screw fixation (Figure 1) despite the fact that surgical stress is minimum in this last procedure (Table 1).

This data is to be correlated with early resumption of prefracture ambulatory ability which decreases the insurgence of pressure sores and the deterioration of the patient's general health condition.

57.5% of the patients answered the questionnaire: Results demonstrated a good recovery of daily activities in 75% of the patients treated with prosthesis who began to walk already on the third day after surgery. In contrast, only 32.5% of the cases treated with fixation devices began to walk after the usual 30 days of no weight bearing in order to favor the formation of bone callous. However, none of the patients contacted complained of dolorability in the operated limb and the lack of ambulatory ability is to be referred to as a decreasing of muscle tone or a worsening of pre-existing clinical conditions and a deterioration of the neurological or psychological conditions of the patients.

Discussion

Recent studies conducted in countries of northern Europe have demonstrated a significant increase in the incidence of fractures of the femoral neck in both genders in the last decade (3) while in the ex-



Figure 1 - The percentage of deaths in patients treated with 3 screws three months after surgery is 91%.

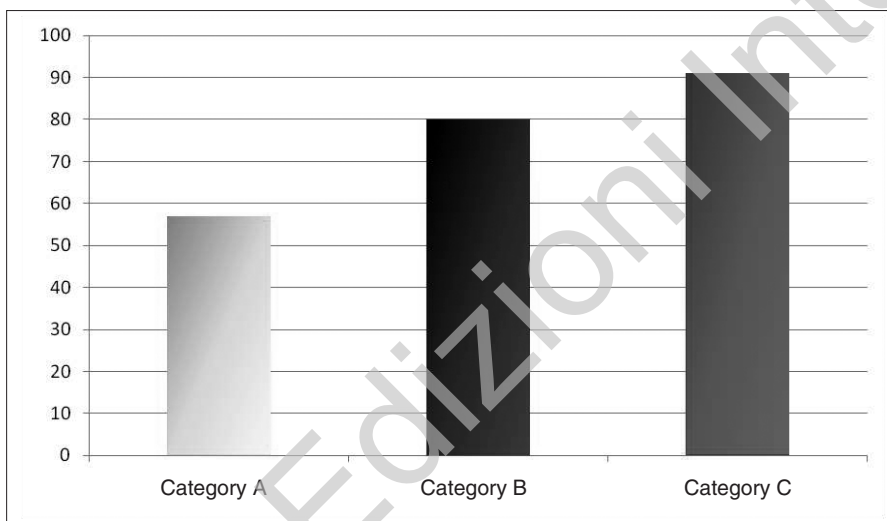


Table 1 - Percentage of deaths after 3 months by category of surgical procedure: (A) prosthesis surgery; (B) surgery with endomedullary nail or plate screw; (C) surgery with three percutaneous screws.

tremely elderly this incidence tends to remain constant or even to decrease (4-8).

Various studies carried out in recent years ("Spina", Rizzoli 2004, Frandsen e Kruse, etc.) demonstrate that, at the moment, we calculate about 500,000 new cases of proximal femur fractures in Europe every year for an expense of 400 million Euro for hospital costs only and we estimate that in 2030 and 2050 this data will increase respectively to 750,00 and 1,000,000 Euro per year.

This fracture pattern, together with that of somatic vertebral fractures and wrist fractures are caused by a traumatic event, often mild, which occur on an pre-existing etiopathogenetic basis such as osteoporosis. For this reason in our case record, and in accordance with current literature, these patients are for the most part female (rate 3:1). Of all the female patients taken into examination, only 10% of them had a positive anamnesis for pharmacological therapy for osteoporosis.

The extremely elderly are also affected with a series of comorbid conditions (such as cardiopathies, pneumopathologies, nephropathologies, etc.) that influence both the choice of surgical procedure and the post operative recovery period (9-12).

Many studies have demonstrated a considerable worsening of the quality of life, both physical and psycho-social, in these patients (2,12-21).

The most notable data is, in fact, represented by the post operative mortality rate which runs at about 15-20% in the first year after the traumatic event as demonstrated by the review of the most recent series of cases.

Parker et al. have demonstrated that, as opposed to conservative treatment, surgical treatment of subcapital displaced fractures and of extracapsular fractures of the proximal epiphysis of the femur has a better cost-utility rate both in terms of quantity of life and in terms of remaining quality of life of these patients.

According to Kne the mortality rate among patients with extracapsular fractures (and thus treated mostly with screw plates) is greater than that of patients with intracapsular fractures (treated with prosthesis). This mortality rate is also influenced by the different physiotherapeutic program which provides for precocious vertical positioning in patients with hemiarthroplasty and a postponement of the vertical positioning to about 5 weeks in patients treated with plates.



Figure 2 - The percentage of deaths of patients treated with endoprosthesis three months after surgery is 57%.

Conclusions

The evaluation of the data of this study demonstrates that the outcome of femoral fractures in elderly patients is mainly influenced by the fracture site; the treatment of choice for medial fractures is total or partial hip replacement which allows for the patient's early mobilization and an early return to an ambulatory status. The evaluations of our study also demonstrate that the outcome is not positively influenced by reduced surgical time (such as with the 3 screw fixation percutaneous procedure).

With the increase of median life expectancy both this type of patient as well as social costs are destined to inevitably increase.

The female gender is the most statistically present and the most involved in this type of problematics, and thus requires a correct clinical diagnosis and a correct pharmacological treatment of osteoporosis as a concurring risk factor in femoral neck fractures.

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