

Main Implications of Early Surgical Treatment of Elderly Hip Fractures and Their Influence on Mortality

Vinicius De Brito Rodrigues^{1*}, Valéria Lima Botelho², Ingridy Caroline Ferreira Silva³, Thiago Rhangel Gomes Teixeira⁴, Indiry Caroline Ferreira Silva⁵ and Rodrigo Jorge de Souza da Fonseca⁶

¹Bahia Federal University Medical School Professor, Brazil

²Masters student in public health ISC/UFBA, Brazil

³Medicine student UFOB, Brazil

⁴Masters student in public health ISC/UFBA, Brazil

⁵Medicine Student UFBA / IMS / CAT, Brazil

⁶Masters student in public health ISC/UFBA, Brazil

*Corresponding author

Vinicius De Brito Rodrigues, Bahia Federal University Medical School Professor, Brazil, E-mail: viniciusbr_medicina@yahoo.com.br

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Abstract

Aim: The present literature review aimed to investigate the main indications and implications of early surgical treatment of hip fractures (proximal femur) and their influence on mortality in the elderly.

Introduction: In Brazil estimates show that about 100,000 hip fractures occur annually in the elderly, being a major public health problem. When examining mortality, it is observed that the average mortality after one year of fracture is about 30%. Studies show that the surgical approach is the key element in its treatment, and in general the surgical approach time should occur as soon as possible, preferably within 24 to 48 hours of admission. Such interval allows clinical stabilization of the patient, and the time of surgical approach may affect the patient's evolution, delay surgical treatment resulting in delayed mobilization and thus affect the patient's functional recovery. On the other hand, failure of clinical stabilization before surgery may increase the risk of perioperative complications.

Methodology: Due to the implications involved in the surgical treatment of proximal femur fractures in the elderly, both peri and postoperatively, an investigation in the literature produced in the last 10 years using SCIELO, PUBMED, and COCHRANE as databases. They were selected produced in English or Portuguese. Advanced research was performed using the following descriptors in English: proximal femur fracture, surgery, elderly, Brazil, hospital, trauma and mortality. About 280 articles were found. A title reading was performed, followed by a summary and 20 articles pertinent to the theme of this systematic review were selected at the end.

Results and Discussion: The present literature review showed that many studies showed that the lack of immediate surgical treatment of the proximal femur fracture resulted in an increase in the mortality rate of about 10% and a complication rate of about 23% in 30% days. Complications due to late surgical treatment included urinary tract infection, pneumonia, thrombosis, as well as other cardiorespiratory problems, and other comorbidities.

Conclusion: This review concludes from the studies analyzed that surgical treatment should be performed on the patient no later than 48 hours after hip fracture or soon after the patient's clinical stabilization, and the mortality rate found after 30 days of surgery. Surgical treatment of proximal femur fracture was about 10% in the elderly. In addition, complications are present in about 23% of postoperative patients, which implies increased health costs involved in rehabilitation, postoperative complications and readmissions.

Keywords: Proximal Femur Fracture, Surgery, Elderly, Brazil, Hospital, Trauma and Mortality.

Introduction

Proximal femur fractures are one of the most common fractures in the elderly. This type of fracture represents 84% of the bone

lesions found in people over 60 years old, constituting a serious public health problem and is a major cause of mortality, functional disability, excessive medical and hospital expenses and socio-family problems in this population. The one-year mortality of the elderly with this type of fracture ranges from 14 to 36% and only 50 to 65% have complete recovery of functional activity [1, 2]. It is noteworthy

that among the fractures of the proximal end of the femur are those of the femoral neck, transtrochanteric and subtrochanteric. More than 98% of cases are treated surgically and evidence indicates that surgery performed within 48 h reduces the risk of complications secondary to femur fracture in the elderly [3]. On the other hand, surgeries performed after 48 hours or more increase the risk of mortality within 30 days and up to 1 year [3].

In general, trauma is low-energy and is associated with other factors present in the elderly, such as malnutrition, decreased visual acuity and reflexes, sarcopenia, decreased daily living activity and especially bone fragility itself. In most cases, surgical treatment is indicated [4]. Conservative treatment is chosen in cases of incomplete fractures without deviation or when there are no clinical conditions for the procedure [2]. The main postoperative systemic complications found in the elderly stand out according to the literature: urinary tract infections, pneumonia and delirium, followed by pressure ulcer, heart failure and acute myocardial infarction. About 35% have delirium as a major complication after hip fracture surgery. In addition, urinary tract infection is very common in postoperative hip fracture patients (23%), also leading to a higher incidence of delirium and increasing length of stay. The use of prophylactic antibiotics in the perioperative period showed a significant decrease in urinary tract infection [5-7].

Thus, due to the great importance of this theme regarding the health of the elderly, the present bibliographic review had as its main objective to conduct a survey of the main studies produced in the last 10 years in order to investigate the main indications and implications of early surgical treatment of fractures of the elderly. Hip (proximal femur) and its influence on mortality in the elderly. For this, a literature search was performed in the COCHRANE, PUBMED AND SCIELO databases. The following descriptors were used: surgery, elderly Brazil, hospital, trauma, mortality. At the end of the research, 20 articles were selected.

Methodology

Kind of Study

This is a qualitative analytical study in which a literature review of articles published in the last 10 years on the indications and implications of early surgical treatment of hip fractures (proximal femur) and their influence on mortality in the elderly was made. For this, an advanced electronic search was performed in the PUBMED, COCHRANE, and SCIELO databases using the following English terms: proximal femur fracture, surgery, elderly, Brazil, hospital trauma and mortality.

About 280 articles were found. After title and abstract analysis, 20 studies suitable for this review were selected.

Participant Types

Elderly patients >60 years with proximal femur fracture.

Types of Intervention

Performing surgical treatment 48 hours after diagnosis of proximal femur fracture compared to not performing surgery.

Types of Outcome

Primary: mortality within 30 days and 1 year.

Secondary: total length of hospital stay, hospital cost, postoperative and preoperative complications.

Inclusion Criteria

Inclusion criteria were:

1. Articles published in the last 10 years,
2. Age: studies using patients over 60 years old,
3. Studies published in English,
4. Double-blind randomized controlled trials, randomized controlled trials by placebo, Meta-analyzes, systematic reviews and cohort studies. Studies that did not meet these criteria were excluded from the present literature review.

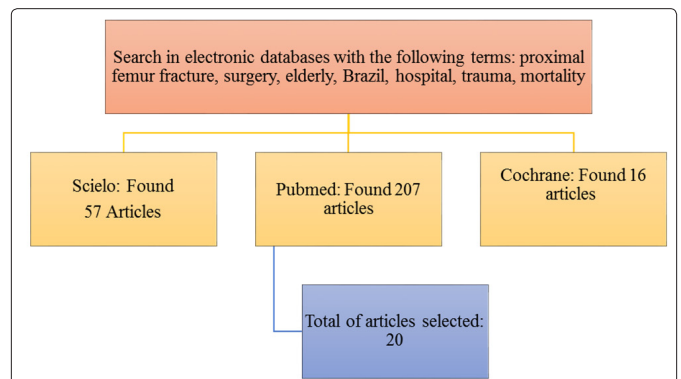
Sampling

Search strategy

Electronic Search

Studies in English or Portuguese published between August 2009 and August 2019. For this purpose, an advanced electronic search of the PUBMED, COCHRANE AND SCIELO databases was performed using the following English terms: proximal femur fracture, surgery, elderly, Brazil, hospital, trauma and mortality.

About 280 articles were found. This process involved search, identification, and study and analysis activity. The study titles were read and after this step, the abstract was read, a necessary task, because despite the use of the descriptors, much material that did not match the theme was obtained, 20 articles eligible for the study were found.



Results and Discussion

Proximal femur fractures in the elderly are positively correlated with mortality and relevant complication rates after 30 days 01 year of surgical treatment. To better evaluate the implications of early surgical treatment of proximal femur fractures in the elderly and their influence on mortality from the use of descriptors, 280 articles were found in the COCHRANE, SCIELO, and PUBMED databases. Based on the application of the eligibility criteria, 20 studies were selected and analyzed in the present literature review. In a study by the objective was to analyze the possible association between delayed surgical treatment and mortality in elderly patients with fractures at the proximal end of the femur [8]. To this end, a retrospective cohort study was conducted in which 314 patients with proximal femoral fractures who underwent surgery in a hospital in São Paulo between January 2003 and December 2007 were evaluated. 100 and that the most frequent cause of fractures was falls (94.4%), predominantly in females (74.7%), and there was no significant difference in relation to the affected side. A higher number of clinical comorbidities, longer hospital stay, use of general anesthesia at surgery and increased mortality were also observed, although no association was found in this study between waiting

time for surgery and mortality [8].

In another study by evaluated case and outcome variables in 1310 patients who suffered an acute fracture at the age of 80 years or older [9]. A comparison was made between a group of 318 very elderly patients (≥ 90 years) and another group of 992 elderly (80 to 89 years). As a result, the very elderly group represented only 0.6% of the total population, but represented 4.1% of all fractures and 9.3% of all hospitalizations for orthopedic trauma. Patients in this group were more likely to require hospitalization (odds ratio 1.4), less likely to return to independent living (odds ratio 3.1) and to have significantly longer hospitalization (ten days, $p = 0.01$). This study concluded that early surgery and mobilization of elderly patients with hip fractures can be extended to other lower limb fractures to assist in early rehabilitation and achieve timely discharge.

In a study by the objective was to correlate operative intervention time with complication rate after periprosthetic fracture surgery and to identify other perioperative factors that positively predict poor postoperative outcome [10]. This study noted that there was an overall complication rate of 45%, including a 30-day mortality of 10%. And that an abbreviated mental test score of 8 out of 10 or less and a delay in surgery >72 h were found to be significant risk factors for adverse outcome. The complication rate presented was 23% in the evaluated elderly and a 10% mortality rate, observed as outcomes after 30 days for femoral neck fractures.

The study by assessed the 2-year mortality rate after hip fracture in elderly patients, including hospital factors (type of intervention, surgical delay), underlying health conditions and, for a subgroup, lifestyle factors (eg, mass index) [11]. Body weight, smoking, alcohol). This study evaluated a total of 828 patients (183 men) aged 70 to 99 years suffering a hip fracture in 2009. The incidence of hip fracture per 1,000 people was higher in women (8.4 vs 3.7 in men and in elderly patients (12.4 for 85-99 years versus 4.4 for 70-84 years).

The mortality rate after 1, 6, 12 and 24 months was 4.7%, 16%, 20.7% and 30.4%, respectively. It was observed that the 2-year mortality rate in hip fractures is associated with gender, age and comorbidities. Being male, over 85 years old and Charlson comorbidity index score greater than 1 are associated. A higher risk, concluding that early surgery reduces the risk in patients with numerous associated comorbidities.

Elaborated a study that aimed to estimate the risk of death and readmission of the elderly with proximal femoral fracture discharge in public hospitals, to identify the causes and to compare the mortality and readmission rates with those observed in the population, of elderly people attended by the public health system in the city of Rio de Janeiro [12]. The results found revealed that the readmission rate in one year, excluding deaths in this period, was 17.8% and the independent readmission mortality rate was 18.6%, and the most frequent causes of deaths were the diseases of the circulatory system (29.5%). Almost 15% of the causes of readmissions were surgical complications, and elderly older than 80 years old had a higher risk of readmission and death.

In a study by developed a cross-sectional, descriptive, retrospective study this time in private hospitals in Brasilia and aimed to estimate the direct cost of both medical and hospital resources involved in

the surgical treatment of femoral fracture due to falls [13]. During hospitalization and postoperatively up to two months after the injury. The research universe consisted of all cases of hospitalization resulting from falls, from January 1, 2008 to June 31, 2009, of beneficiaries 60 years of age and over, in five private hospitals accredited to an agreement. From the city of Brasilia. This study concluded that hip fracture is a serious problem for the financial management of the private health sector, and the cost of care remains significant until patient rehabilitation and that the direct cost of femur fractures in elderly people used during up to two months after surgery corresponded to 5.7% of the resources used in the hospital period. Evaluated the costs involved in readmissions after hip fracture surgery, being the main diagnosis of orthopedic discharge associated with 30-day readmission in terms of numbers. Of 1081 patients, 129 (11.9%) were readmitted within 30 days [14]. The average length of hospital stay for readmissions was 8.7+18.8 days, significantly longer than the initial period (4.6 + 2.3 days) ($P = 0.03$). Nineteen percent (24 patients *19%) died during readmission versus 2.8% during admission to the index. These patients accrued an average hospital rate of \$ 16,308 + \$ 6400 during their initial hospitalization, compared to readmission costs of \$ 14,191+\$ 25,035 ($P=36$). This study concluded that admission after hip fracture is expensive and harmful, and the rates were similar between original fracture admission and readmission. Patients were most often readmitted for medical complications after the original hospital stay. The most common reasons for readmission included pneumonia, CHF, new fractures, intestinal obstructions, and infections. Of the patients, 19% died during readmission, and the average readmission was 8.7 days. Readmitted patients generated similar average hospital rates during readmission (\$ 14,191) compared to initial hospitalization (\$ 16,358), so future research efforts should focus on techniques to reduce readmission rates after hip fracture. A retrospective study by aimed to evaluate preoperative examinations and their impact on patient outcome and medical expenses in patients with proximal femoral fracture [15]. About 921 preoperative tests were performed on 780 (28%) patients, and 375 postoperative tests were performed on 329 (12%) patients ($P < 0.001$). This study found that non-routine preoperative examinations extend the time to surgery, increase hospitalization time and contribute to 30-day mortality and increase costs.

A study by reviewed the consecutive population of hip fracture patients to identify predictors of excess risk. About four hundred and sixty-five consecutive patients were treated over a 2-year period at the hospital, with follow-up for 1 year after hip fracture after admission [16]. This study confirmed that surgery within 36 hours improves mortality not only in the acute period but also up to 1 year after surgery. Although no additional reduction in mortality was found in those who underwent surgery within 24 hours, however, such study recommends new ones on the subject, since in this case the number of patients with other risk factors were low, which may result in bias.

A retrospective study by evaluated geriatric patients admitted to a tertiary health center between January 2009 and September 2013 complaining of proximal fall femoral fracture, and all patients were operated by one of three separate methods: proximal femoral nail, hemiarthroplasty, and total hip arthroplasty [17]. Of surviving patients, those with at least 1 year of follow-up were included in the study, such a study concluding that age is the major risk factor in first-year mortality in patients older than 75 years with

hip fracture. Especially age above 85 years is an independent risk factor for mortality. In addition to advanced age, more need for blood transfusions and arthroplasty are other risk factors for first-year mortality. He concluded that after 75 years, mortality in the first year may be higher if the patient is treated with arthroplasty.

Another descriptive retrospective study developed in southern Brazil evaluated the one-year mortality of elderly patients with hip fractures surgically treated at a hospital in southern Brazil. For this, 213 records of patients over 65 years old were selected. It was observed that the one-year mortality rate was 23.6%, being higher in women at a ratio of 3: 1, and the main comorbidities associated with the mortality outcome were anemia and dementia (2).

In a study by the objective was to investigate the reasons for surgical delay in patients with proximal hip fracture and to compare mortality differences between cases of late surgery and cases of non-late surgery in the elderly [18]. This study evaluated 1290 patients between 2003 and 2013 About 888 patients underwent late surgery (mean 7.5 days, range 3-167 days) after hip fracture. This study demonstrated that late surgery after proximal hip fracture was significantly related to mortality at 30 days and 1 year and that delayed surgery due to drug use and medical comorbidity was related to mortality at 30 days after adjustment.

Investigated the mean waiting time and outcome in hospitalized patients with proximal femoral fractures [19]. Data were collected from 234 patients between May and November 2015. This study analyzed the type of fracture, presence of comorbidities (Charlson Index (ICC)), ASA (American Society of Anesthesiology) score, day of the week of hospitalization, type of treatment received, functional recovery and the patient's condition at discharge. It was observed that in 46.4% of the cases, the duration of preoperative stay before surgery was compatible with what is recommended in the literature (<48 h). In 20% of cases, the time to surgery was over 96 hours. This study concluded that specific protocols for the management of proximal femoral fractures are crucial for reducing disease at surgery and obtaining better results, and that improving preoperative resources for patient optimization has the potential to reduce operative delay and time. of permanence.

A study by aims to conduct a prospective study with ten years of follow-up of two hundred patients with proximal femoral fracture [20]. It was observed that long-term revision surgery was only necessary in 3/200 patients (1.5%) beyond the second year of this surgery. On the other hand, more than half of all patients had died five years after the initial surgery. The exact incidence of contralateral femur fracture was 11.9%, rising to 15.4% if the patient survived for at least one year. Almost every five patients (19%) experienced another fall and had another severe fracture.

A study by aimed to evaluate morbidity and mortality after hip fracture by frailty in an elderly population of Saudi Arabia [21]. This study demonstrated that patients with hip fractures have high morbidity and mortality rates approaching 30% and that age and ASA score significantly influence this high mortality rate.

In assessing centenary patients, a study by investigated hip fractures in this group and recorded the cost of treating these fractures to identify the social and economic impact these injuries impose on the health system [22]. It found that the 1-year mortality rate for

anyone 100 years and older is 67% for men and 59% for women, suggesting that the 1-year mortality rate of 71% in this study current is just slightly worse than the usual life expectancy of a person over 100 years old. Thus, such study suggests that the extreme elderly should receive surgical treatment for hip fracture.

A study by aimed to report the incidence of atypical femoral fractures in our center and compare the immediate postoperative results against typical femoral fractures(TFFs) [23]. Of two hundred and thirty-nine patients, a total of 122 patients were identified as petrochanteric, subtrochanteric or proximal femoral shaft fractures, of which 25 (20.5%) had atypical radiographic features compatible with the EFF. Results obtained after atypical femoral fractures may be equivalent to typical femoral fractures in the geriatric population.

Conclusion

This study aimed to perform a literature review on the main implications of early surgical treatment of proximal femoral fractures in the elderly on mortality, 20 articles were analyzed. This review concludes from the studies analyzed that surgical treatment should be performed on the patient within 48 hours after hip fracture or soon after clinical stabilization of the patient. In fact, many studies show that the lack of immediate surgical treatment of the proximal femur fracture implies an increase in the mortality rate by about 10% in 30 days and about 30% in one year. The implications of not performing immediate surgical treatment shown in several studies report the presence of urinary tract infection, pneumonia, thrombosis, and other cardiorespiratory problems, leading to an increase in the number of deaths within 30 days to 1 year after surgery. In addition, the public or private health costs involved in the treatment of postoperative complications of proximal femoral fractures, rehabilitation and readmission after surgical treatment are exorbitant, being a major public health problem.

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