Does Early Surgical Fixation of Proximal Femoral Fractures in Elderly Patients Affect Mortality Rates?*

A cirurgia precoce nas fraturas do fêmur proximal em idosos reduz a taxa de mortalidade?

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Abstract

Objective To analyze whether a reduction in the waiting time for orthopedic surgery in elderly patients with fracture of the proximal end of the femur leads to a reduction in in-hospital mortality, 6-month mortality, and duration of hospitalization.

Methods This was a retrospective cohort study including 81 patients with intertrochanteric and subtrochanteric fractures who underwent surgical repair between 2015 and 2016 in a referral hospital, before and after a protocol for early surgical fixation (< 48 hours) was implemented.

Results The mean length of hospital stay decreased from 17 to 11 days. Regarding the in-hospital mortality rate, five patients died before, and another five died after the protocol was implemented. The 6-month postoperative mortality decreased from 26.7% to 19.4%. The results showed no statistical significance.

Conclusion The present study demonstrated that there is a tendency to reduce the length of hospital stay and 6-month mortality when the surgery for the treatment of proximal femoral fractures in the elderly is performed within 48 hours of hospitalization.

Keywords
- hip fractures
- mortality
- elderly
- orthopedics

Resumo

Objetivo Analisar se a redução no tempo de espera para cirurgia ortopédica nos pacientes idosos com fratura da extremidade proximal do fêmur impacta na redução da mortalidade intra-hospitalar, da mortalidade em 6 meses de seguimento, e na redução do tempo de internação hospitalar.

Métodos Trabalho de coorte retrospectiva fundamentado na análise de prontuários de 81 pacientes internados com diagnóstico de fratura transtrocanteriana ou subtrocanteriana do fêmur, e submetidos a tratamento cirúrgico em 2015 e 2016 em um

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hospital de referência no atendimento ao trauma, antes e após a implantação de protocolo para cirurgia em até 48 horas.

Resultados Observou-se redução do tempo médio de internação de 17 para 11 dias após a implantação do protocolo. Com relação à mortalidade intra-hospitalar, cinco pacientes faleceram antes da implantação do protocolo, e cinco, após a implantação do protocolo. Referente à mortalidade extra-hospitalar, avaliada em 6 meses de pós-operatório, observou-se uma redução de 26,7% para 19,4%. Os resultados não apresentaram significância estatística.

Conclusão O presente estudo demonstrou que existe uma tendência à redução do tempo de internação hospitalar e da mortalidade em 6 meses quando a cirurgia para tratamento de fraturas do fêmur proximal no idoso é feita em até 48 horas de internação hospitalar.

Palavras-chave
- fraturas do quadril
- mortalidade
- idoso
- ortopedia

Introduction

The progressive increase in life expectancy observed over the last decades resulted in a significant increase in the prevalence of trauma in elderly individuals. Proximal femur fractures are among the most common fractures in the elderly, and present high morbidity and mortality rates, constituting a public health issue. Epidemiological data indicate that the 1-year mortality of elderly patients with proximal femoral fractures ranges from 14 to 36%,[1–6] and only 50 to 65% of these patients completely recover their previous functional activity.[1,7,8]

More than 98% of the cases are surgically treated, and evidence indicates that surgery performed within 48 hours reduces the risk of complications secondary to femoral fractures in the elderly. On the other hand, surgeries performed after 48 hours or more increase the risk of mortality in 30 days and up to 1 year.[9–13] Considering the importance of this issue, the present study was developed to analyze whether the reduction in the waiting time for orthopedic surgery in elderly patients with proximal femoral fractures has an impact on the reduction of in-hospital and 6-month mortalities, as well as on the length of hospital stay.

Material and Methods

This was a retrospective cohort study including male and female patients $>$ 60 years old with closed isolated femoral transtrochanteric or subtrochanteric fractures. The anatomical classification of the fractures was made by an orthopedist with a specialist degree at the emergency room, and was confirmed by the orthopedic surgeon at the referral hospital.

The present study was submitted and approved by the Ethics in Research Committee of our institution under the number 1.890.165. Data regarding hospitalization (length of hospital stay, diagnosis, treatment and clinical outcome) were obtained through a review of electronic medical records. The verification of death and its date were obtained from the electronic medical records, by contact by telephone, or from the obituary.

A specific protocol was developed in 2016 for the care of elderly patients with proximal femoral fractures in the urgency and emergency network of our hospital to reduce the waiting time for orthopedic surgery in this type of fracture and, thus, to reduce mortality and length of hospital stay. The primary objective of this protocol is to operate elderly patients with transtrochanteric and/or subtrochanteric fractures within 48 hours of hospital admission.

Every patient in the study was admitted and underwent surgical treatment at a referral hospital in trauma care starting in 2015. The patients were divided into 2 groups: those who underwent surgery under the femoral fracture in the elderly protocol (after the first quarter of 2016) and those who underwent surgery outside the protocol (throughout 2015 and during the first quarter of 2016).

Patients with incomplete and/or insufficient data at the review of the medical records, patients who had undergone nonsurgical treatments, and those who could not be reached by telephone, deemed lost at follow-up, were excluded from the study.

The following variables were studied: length of hospital stay (before and after the implementation of the protocol), and general, in-hospital and 6-month mortalities. The data were analyzed through tables and parametrical analysis of variance (ANOVA) and equality of two proportions statistical tests using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, US),Minitab 16 (Minitab, LLC., State College, PA, US), and Excel (Microsoft Corporation, Redmond, WA, US). A maximum significance level of 5% ($p \leq 0.05$) was defined.

Results

A total of 159 patients were selected in 2015 and 2016 under ICD10 S72. Of the total, 78 patients were excluded because they did not meet the study criteria, resulting in a final sample of 81 patients (►**Fig. 1**). All of the patients had their electronic medical records reviewed and/or were contacted by telephone.

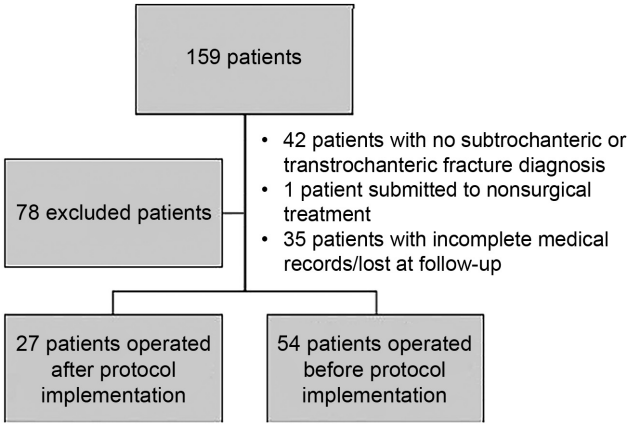

Fig. 1 Flow chart of patient inclusion.

The mean hospital stay was of ~17 days for the group evaluated prior to the implementation of the protocol and of 11 days for patients hospitalized after the implementation of the protocol (►**Table 1**). There was no statistically significant difference ($p = 0.095$).

Of the total sample, 19 patients died during the investigation period, corresponding to 26.7% of the preprotocol implementation group and 19.4% of the postprotocol implementation group, respectively ($p = 0.446$) (►**Table 2**).

During the hospital stay, 5 patients from the preprotocol implementation group and 5 from the postprotocol implementation group died, but there was no statistical difference in the mortality rate between the groups ($p = 0.210$) (►**Table 3**).

Discussion

The present study evaluated the length of hospitalization and in-hospital and 6-month mortalities in elderly patients with proximal femoral fractures before and after the implementation of a protocol for early definitive surgical treatment (within 48 hours of admission). We observed a decrease in the length of hospitalization and in the mortality rate at 6 months postsurgery, but with no statistical significance.

Our results showed a reduction in general mortality in 6 months from 26.7% to 19.4% after the implementation of the protocol (a high value compared to other studies, which can be explained by the small number of patients analyzed).

Although it is recommended that the optimal time for surgical treatment of proximal femoral fractures is 24 to 48 hours after the occurrence, some studies have not demonstrated a reduction in mortality or an increase in functional recovery with early surgery.[2,14–18]

Orosz et al[2] studied 1,206 patients aged > 50 years old and observed a general mortality rate in 2 months of 8.3%; their analysis showed that surgery within 24 hours does not reduce mortality in 2 and 6 months.

Siegmeth et al,[16] after analyzing 3,628 (clinically compensated) patients aged > 60 years old, concluded that the mortality of previously healthy patients increased when the surgical procedure was performed after 48 hours.

Regarding the length of hospital stay, we noticed a reduction from 17 to 11 days, which, although with no significant association, is consistent with literature findings. Lefaivre et al[19] evaluated 607 patients and concluded that the delay in performing the surgical treatment increased the length of hospital stay, which was related to medical comorbidities, age, gender and type of fracture.

We also identified a percentage increase in in-hospital deaths when comparing the two study groups, which is possibly associated with the medical conditions of the patients and with the lower number of patients operated after the implementation of the protocol.

As limitations of the present study, we emphasize that this is a retrospective analysis, with a small sample when compared with large multicenter studies.

Table 1 Comparison of in-hospital length of stay

Length of hospital stay (days)	Before protocol implementation	After protocol implementation
Average	16.6	11.3
Median	13	8
Standard deviation	14.8	9.3
Coefficient of variation	89%	82%
Minimum value	6	2
Maximum value	108	35
N	54	27
Confidence interval	4	3.5
p-value	0.095	

Table 2 General mortality in 6 months

	Before protocol implementation		After protocol implementation		*p-value*
	n	%	*n*	%	
Non-death	33	73.30%	29	80.60%	0.446
Death	12	26.70%	7	19.40%	

Table 3 Analysis of deaths

	Before protocol implementation		After protocol implementation		*p-value*
	n	%	*n*	%	
In-hospital	5	41.70%	5	71.40%	0.21
After discharge	7	53.80%	2	28.60%	

Future studies will be performed with an increased sample population operated under the implemented protocol.

Conclusion

The ideal timing for surgical treatment of proximal femoral fractures in elderly patients is still controversial. Several factors may influence this decision, such as clinical comorbidities and the availability of equipment, a trained staff and a postoperative intensive care unit. The present study demonstrated that the length of hospital stay and the 6-month mortality rate in elderly patients tend to be reduced when the surgical treatment of proximal femoral fractures is performed within 48 hours of admission.

Conflicts of Interests

The authors have no conflicts of interests to declare.

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