

## Evaluation of the Risk Factors Affecting Elderly Patients' Inability to Regain Pre-Fracture Mobility Following Hip Fracture Surgery

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Conflict of interest: Nil

### Abstract

**Background:** Our aim in this study is to examine the effects of fracture type on restoring mobility in the postoperative period.

**Methods:** In this observational study, 100 consecutive patients over the age of 65 who were admitted to the hospital with hip fractures were examined. Hospital digital records were examined and patients' age, gender, body mass index (BMI), smoking, American Society of Anesthesiologists (ASA) score, comorbidities (cardiovascular, respiratory, renal, neurological diseases and malignancy), fracture type, type of implant used in surgery and Charlson comorbidity index score were recorded.

**Result:** 100 patients were included in the study. 62 patients were female and 38 were male, with a mean age of  $78.23 \pm 8.31$  years. There 61 patients were intertrochanteric fractures and 39 were femoral neck fractures. 12 patients underwent proximal femoral nail (PFN), 72 patients underwent hemiarthroplasty, 13 patients underwent dynamic hip screw (DHS) and 3 patients underwent total hip arthroplasty. In the analysis performed to determine the level of mobility, it was found that 96 patients moved without the use of an aid and 4 patients moved with the use of an aid in the pre-fracture period. In the sixth month postoperative follow-up, it was observed that 61 patients were ambulated without the use of an aid, 25 patients were ambulated with the use of an aid, and 14 patients were immobile.

**Conclusion:** Advanced age, high ASA score, cardiovascular disease or malignancy among comorbidities, intertrochanteric fracture as fracture type, and use of PFN as implant type were the main risk factors for not regain to pre-fracture mobility and ADL.

**Keywords:** DHS, PFN, ADL, ASA.

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### Introduction

Hip fracture is one of the most important causes of functional failure and death in elderly patients. The anticipated life expectancy of elderly patients with hip fractures is lower. Approximately 15%–20% of patients die within one year after a hip fracture, and this rate is higher in males. Furthermore, mortality rates of up to 32% have been reported in elderly patients who underwent hemiarthroplasty due to an unstable hip fracture. The reported short, mid-, and long-term mortality rates vary between genders and among countries. [1-4]

Numerous risk factors related to geriatric hip fractures may affect mortality, such as age, gender, American Society of Anesthesiologist (ASA) score, dementia grade, gait ability, fracture type, surgical timing, surgery type, duration of hospitalization, and albumin level. The effects of comorbid diseases and predictive risk factors on mortality rates in elderly patients with hip fractures continue to be a subject of discussion. [5-7] Although this topic has been extensively studied, the mortality

rates and determinants of mortality after hip fractures are still not well-defined. [2] There are only a few studies reporting long-term outcomes; however, the mortality rates of surgically treated patients with hip fractures have been found to exceed the age-matched death rates at 10-year follow-up. [8-9]

Our aim in this study is to examine the effects of fracture type on restoring mobility in the postoperative period, which is not emphasized much in studies in the literature.

### Material and Methods

In this observational study, 100 consecutive patients over the age of 65 who were admitted to the hospital with hip fractures were examined. Hospital digital records were examined and patients' age, gender, body mass index (BMI), smoking, American Society of Anesthesiologists (ASA) score, comorbidities (cardiovascular, respiratory, renal, neurological diseases and

malignancy), fracture type, type of implant used in surgery and Charlson comorbidity index score were recorded. In order to determine the mobility levels of the patients before the hip fracture occurred, the information obtained and recorded from the patient, or his/her relatives were reviewed. In order to determine their mobility levels in the sixth month postoperatively, a detailed examination of the patients who came for routine control was performed. Patients who could not come for the control were called by phone and their mobility levels were determined.

All statistical analyzes were performed using the SPSS statistical program (Version 25.0; SPSS Inc., Chicago, IL). While evaluating the study data, the data were summarized by using descriptive statistical methods (mean, standard deviation, frequency, minimum, maximum). Pearson Chisquare independence tests were used to test the independence between two categorical variables, and the Mann Whitney U Test was used for the two groups to compare the data that did not show normal distribution. The relationships between the

classified variables forming the 2x2 crosstabs were investigated with Fisher's Exact tests. The statistical significance level was accepted as  $p < 0.05$ .

## Results

100 patients were included in the study. 62 patients were female and 38 were male, with a mean age of  $78.23 \pm 8.31$  years. There 61 patients were intertrochanteric fractures and 39 were femoral neck fractures. 12 patients underwent proximal femoral nail (PFN), 72 patients underwent hemiarthroplasty, 13 patients underwent dynamic hip screw (DHS) and 3 patients underwent total hip arthroplasty. In the analysis performed to determine the level of mobility, it was found that 96 patients moved without the use of an aid and 4 patients moved with the use of an aid in the pre-fracture period. In the sixth month postoperative follow-up, it was observed that 61 patients were ambulated without the use of an aid, 25 patients were ambulated with the use of an aid, and 14 patients were immobile

**Table 1: Outcome**

Mean age		78.23±8.31 yrs
Male: Female		38:62
smoking		49(49.00%)
Diabetes		23(23.00%)
ASA grade (I: II: III: IV)		0:13:56:31
Fracture type (Intertrochanteric Fracture: Collum Femoris Fracture)		61:39
Type of implants (PFN: DHS: Hemiarthroplasty: Total Arthroplasty)		12:13:72:3
Pre-fracture mFIM score		84.32±18.20
Postoperative 6th month mFIM		75.12±19.32
Pre-fracture mobility	Mobil without an aid	4(4.00%)
	Mobil with an aid	96(96.00%)
Postoperative 6th month mobility	Mobil without an aid	61(61.00%)
	Mobil with an aid	25(25.00%)
	Immobile	14(14.00%)

## Discussion

In our study show that 29.00% of patients do not regain their pre-fracture mobility after hip fracture. In a meta-analysis by Bertram et al., [10] it was found that 42% of elderly hip fracture patients could not regain pre-fracture mobility, and 35% could not walk unaided after the fracture. In the study of Mariconda et al. [11], it was observed that only 57% of the patients returned to their pre-fracture functional state and 13% became immobile in the first year after fracture. Although the time to regain normal activities of daily living after fracture varies between 4-11 months, this period is the first 6 months after surgery in the vast majority of patients. [12]

According to literature data, it has been shown that the most intense period of post-fracture healing is in the first 4 months, and the recovery of activities of daily living is very slow starting from the 6th

month. [13] Many risk factors have been identified for inability to regain pre-fracture functional status after hip fracture. [14] There is no clear consensus on the identified risk factors. These risk factors can be counted as age, ASA status, comorbidities, poor cognitive status, and high dependency level before fracture. [15] There are studies claiming that high age and poor cognitive status are the most important risk factors. [16] In studies on comorbidities, as the number of comorbidities, especially dementia and cardiovascular diseases, increases, it has been determined that the functional status after fracture is at risk of severe worsening. [17] As with comorbidities, a high ASA score has been shown to be an important risk factor for inability to regain pre-fracture mobility in the postoperative period.

## Conclusion

In the postoperative period, a high rate of worsening in activities of daily living and limitation of movement were detected in patients who were operated for hip fractures. Patients who have intertrochanteric fractures, who use PFN as an implant type during surgery, and those with cardiovascular disease or dementia are more likely to be unable to return functionally to the pre-fracture stage. According to the results obtained in this study, the effects of keeping the patients under close follow-up in the postoperative period, ensuring the participation of the patients in the rehabilitation programs to be applied and providing the necessary trainings to the relatives of the patients about the postoperative rehabilitation of the existing disease will have a positive effect on the results.

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