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Early Mortality Rates and Types of Surgery in Geriatric Patients with Hip Fractures Undergoing Surgical Treatment

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ABSTRACT

Aim: The aim of this study was to investigate the relationships between mortality within 30 days after surgery and fracture incidence, implant type and surgical timing in patients older than 65 years who developed hip fractures after a simple fall and were treated surgically.

Material and Methods: Patients admitted to the emergency department of the xxx Department of Orthopedics and Traumatology between 01 January 2010 and 31 July 2020 were included. Among these patients, the relationships between sex, age, duration of surgery, type of surgery and postoperative mortality rate were retrospectively evaluated in patients older than 65 years who were diagnosed with isolated hip fracture and who underwent prosthesis or proximal femoral nail/plate screw surgery between the specified dates. In this study, 450 patients treated within the specified time intervals were evaluated, and 308 patients fulfilled the criteria of our study.

Results: There was a statistically significant difference between the mortality rate and surgery (implant) ($p<0.05$). Additionally, there was a statistically significant difference between the mortality rate and the type of anesthesia ($p<0.001$). There was no statistically significant difference between the time between hospitalization and surgery (days) or between surgery and discharge (days) or between hospitalization and mortality ($p=0.984$). The difference between age at operation and mortality rate was statistically significant ($p<0.001$).

Conclusion: In this study, the mortality rate in the first month after surgery was 8.1%, and the most important factors affecting mortality were the type of surgery and type of anesthesia.

Keywords: Hip fractures; timing of surgery; mortality; geriatric.

Cerrahi Tedavi Uygulanan Kalça Kırığı olan Geriatrik Hastalardaki Erken Dönem Mortalite Oranları ve Cerrahi Tipleri

ÖZ

Amaç: Bu çalışmanın amacı, basit düşme sonrası kalça kırığı gelişen ve cerrahi olarak tedavi edilen 65 yaş üstü hastalarda cerrahi sonrası 30 gün içinde mortalite ile kırık, implant tipi ve cerrahi zamanlaması arasındaki ilişkiyi araştırmaktır.

Gereç ve Yöntemler: 01 Ocak 2010 - 31 Temmuz 2020 tarihleri Düzce Üniversitesi Tıp Fakültesi Ortopedi ve Travmatoloji Anabilim Dalına başvuran hastalar incelendi. Bu hastalar arasından belirtilen tarihler arasında izole kalça kırığı tanısı ile protez veya proksimal femoral çivi/plak vida ameliyatı yapılan 65 yaş üstü hastalarda cinsiyet, yaş, ameliyat zamanı, ameliyat tipi ve ameliyat sonrası mortalite oranları arasındaki ilişki retrospektif olarak değerlendirildi. Bu çalışmada, belirtilen zaman aralığında tedavi edilen 450 hasta değerlendirildi ve 308 hasta çalışmamızın kriterlerini karşıladı.

Bulgular: Mortalite oranları ile cerrahi (implant) arasında istatistiksel olarak anlamlı bir fark vardı ($p<0,05$). Ayrıca Anestezi tipi ile mortalite oranları arasında istatistiksel olarak anlamlı bir fark vardı ($p<0,001$). Hastaneye yatış ile ameliyat arasında geçen süre (gün) ve ameliyat ile taburculuk arasında geçen süre (gün) ile mortalite oranları arasında istatistiksel olarak anlamlı bir fark yoktu ($p=0,984$). Ameliyat yaşı ile mortalite oranları arasındaki fark istatistiksel olarak anlamlıydı ($p<0,001$).

Sonuç: Bu çalışmada ameliyat sonrası birinci ayda mortalite oranı %8,1 olarak bulundu ve mortaliteyi etkileyen en önemli faktörlerin ameliyat tipi ve anestezi tipi olduğu saptandı.

Anahtar Kelimeler: Kalça kırığı; ameliyat zamanlaması; mortalite; geriatri.

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INTRODUCTION

With the development of modern facilities, the average life expectancy is increasing worldwide, and a significant increase in life expectancy is being observed in the elderly population. However, decreases in physical capacity, accompanying systemic problems and bone mass loss increase the risk of fractures due to simple trauma observed in elderly patients (1). Hip fractures observed in the elderly population are the second most common type of fracture after distal radius fractures (2). Hip fractures observed in patients older than 60 years constitute 84% of the bone lesions observed in this population and are a serious public health problem as well as a major cause of mortality, disability and medical costs (3,4). It has been reported that the life expectancy of patients with hip fractures is lower than that of the normal elderly population, and the mortality rate in the first year after fracture is approximately 20% (5). Studies have emphasized that increased age, male sex, physical condition and delayed treatment are the main factors in determining mortality (6).

In the literature, it has been reported that age alone is not an effective risk factor for mortality, and systemic disorders before fracture are the main determinant (7). It has been reported that patients who underwent surgery for intertrochanteric femur fracture were older than patients with femoral neck fracture, and their functional recovery was worse; however, there are also studies showing that the type of implant used in treatment is not directly related to patient mortality (8,9).

Compared to femoral neck fractures, intertrochanteric fractures are observed in older patients who need home support and have more medical problems. Additionally, intertrochanteric fractures are more common in patients with more extensive osteoporosis than in those with femoral neck fractures (10).

Fractures of the trochanteric region may be caused by direct blows to this region or indirect mechanisms as a result of severe muscle contractions and movements involving rotation, especially in elderly patients (10). While trochanteric fractures in young people are usually caused by high-energy trauma, in elderly individuals, 90% of these fractures are caused by simple falls (10,11).

Although surgery is the treatment of choice for hip fractures, it is rarely preferred when the patient is elderly, has comorbidities that prevent tolerance of the surgical procedure, or is mentally impaired. When surgical treatment is considered from a general perspective, it has been stated that in young patients (20-50 years of age), closed reduction internal fixation, cannulated screw and dynamic hip screw options are more prioritized; however, at older ages, treatment options may vary according to the patient's condition, bone quality and surgeon's experience. Due to their biomechanical stability and antirotation ability, cannulated screws are currently the most preferred method for treating nondisplaced femur fractures. Dynamic hip screws are the preferred method in many clinics because of their dynamic and static compression and stretching ability, ability to perform anatomical reduction according to the femoral neck angle and favorable fracture healing properties. However, both of these methods can cause complications such as nonunion, avascular necrosis, reoperation, infection and implant failure. Cannulated screw application has advantages such as rotational stability, less vascular and soft tissue damage due to minimally invasive application, less blood loss, shorter operation time and patient satisfaction. The treatment option naturally changes from internal fixation to arthroplasty in physiologically elderly patients with significant osteopenia and multiple comminuted fractures. Hemiarthroplasty is a good option even for very frail, bedridden patients because it provides in-bed mobility, body hygiene and other complications that may develop due to immobility. Hemiarthroplasty is also a suitable and reliable surgical option for patients with low life expectancy to avoid complications such as nonunion, avascular necrosis and related secondary surgical interventions (12-14).

Today, many orthopedic surgeons recommend primary total hip arthroplasty for the treatment of femoral neck fractures because of its superior clinical results compared to hemiarthroplasty. However, in general, the indications for primary total hip arthroplasty after fracture are associated arthrosis, rheumatoid arthritis, Paget's disease and tumors involving both sides of the joint. The rate of dislocation is greater in patients who underwent total hip arthroplasty for osteoarthritis than in patients who underwent total hip arthroplasty for femoral neck fractures (15-17).

MATERIAL AND METHODS

Patients who applied to the emergency department of Düzce University Faculty of Medicine, Department of Orthopedics and Traumatology, who complained of hip pain after a simple fall, who were diagnosed with hip fracture as a result of necessary examinations and tests and who underwent surgical treatment between January 01, 2010, and July 31, 2020, were included in the study. Before starting the study, the approval of the Düzce University noninterventional health research ethics committee was obtained. (Decision Number: 2020/202-21/09/2020)

The relationships between sex, age, operation time, operation type and postoperative mortality rate in patients older than 65 years who underwent prosthesis (cemented/uncemented partial endoprosthesis, partial endoprosthesis with calcar replacement) or proximal femoral nail surgery with a diagnosis of isolated hip fracture (colum femoris and intertrochanteric femur fracture) between the specified dates were retrospectively evaluated. In this context, approximately 308 patients who were treated during the specified time interval were included in the evaluation.

Statistical Analysis

The results of the study were analyzed using the Statistical Package for Social Sciences (SPSS) Version 29.0. Since the number of data points in a group was less than 30, the data were analyzed with nonparametric tests. Categorical variables are represented by frequency and percentage values, and numerical data are represented by median, minimum and maximum values. The Mann–Whitney U test was used to compare medians between 2 groups. The relationship between two categorical data points was analyzed with the chi-square test. A significance level of $p<0.05$ was used for all tests.

RESULTS

The detailed demographic information of the participants is shown in Table 1, with frequency and percentage values. It was determined that 91.9% of the participants did not die within one month and that 8.1% died within one month. Partial endoprostheses were applied to 48% of the participants. Sixty percent had femoral neck fractures, and 40% had intertrochanteric femur fractures. Sixty-nine percent of the participants were female, and 32% were male. The type of anesthesia used was 84% spinal and 16% general.

Table 1. Descriptive statistics of participants' demographic information

		n	%
Mortality	Died within a month	25	8.1
	Alive within a month	283	91.9
Surgery (implant)	Partial endoprosthesis	12	48.0
	Cemented partial endoprosthesis	6	24.0
	Proximal Femoral Nail	3	12.0
	Partial endoprosthesis with calcar support	3	12.0
	Dynamic hip screw	1	4.0
Type of fracture	Femoral neck fracture	15	60.0
	Intertrochanteric femur fracture	10	40.0
Gender	Female	17	68.0
	Male	8	32.0
Anesthesia type	General	4	16.0
	Spinal	21	84.0

As shown in Table 2, there was a statistically significant difference between the mortality rate and surgery (implant) ($p<0.05$). Partial endoprosthesis therapy was administered to 48% of those who died within one month and 54.1% of those who did not die within one month.

There was a statistically significant difference between the mortality rate and anesthesia type ($p<0.01$). Spinal anesthesia was used in 84% of those who died within one month and 86.2% of those who did not die within one month.

As shown in Table 3, no statistically significant differences were found between the hospitalization and surgery durations (days), between the surgery and discharge durations (days), or between the mortality rates (all p values>0.05). The difference between age at operation and mortality rate was statistically significant ($p<0.01$). The median age at operation for individuals who died within one month was 85 years, and the median age at operation for individuals who did not die within one month was 80 years.

Table 3. Analysis of the difference between mortality rates and age at operation, time between hospitalization and surgery, and time between surgery and discharge

	Died within a month	Alive within a month		
	Median (min- max)	Median (min- max)	*U*	p
Age of Operation	85 (77-95)	80 (67-95)	29.5	<0.001
Time between hospitalization and surgery (days)	3 (1-8)	3 (0-17)	3529.0	0.984
Duration between surgery and discharge (days)	5 (1-25)	5 (1-48)	2945.5	0.159

Table 2. Analysis of the differences in demographic data according to mortality rate

		Mortality					
		Died within a month		Alive within a month			
		n	%	n	%	χ^2	p
Surgery (implant) Type of fracture	Partial endoprosthesis	12	48.0	153	54.1	14.800	**<0.05**
	Cemented partial endoprosthesis	6	24.0	32	11.3		
	Proximal Femoral Nail	3	12.0	32	11.3		
	Total hip arthroplasty	0	0.0	3	1.1		
	Partial endoprosthesis with calcar support	3	12.0	42	14.8		
	Dynamic hip screw	1	4.0	20	7.1		
	Dynamic condyle screw	0	0.0	1	0.4		
Gender	Femoral neck fracture	15	60.0	160	56.5	2.286	0.126
	Intertrochanteric femur fracture	10	40.0	123	43.5		
Anesthesia type	Female	17	68.0	175	61.8	3.240	0.72
	Male	8	32.0	108	38.2		
Surgery (implant)	General	4	16.0	39	13.8	11.560	**<0.01**
	Spinal	21	84.0	244	86.2		

DISCUSSION

In our study, we examined the relationship between the mortality observed within 30 days after surgery and fracture incidence, the type of implant used and the timing of surgery in patients older than 65 years who developed hip fractures after a simple fall and were treated surgically. Increasing life expectancy leads to a gradual increase in the elderly population. Changes in bone structure with advancing age and an increase in osteoporosis lead to an increase in the incidence of femoral neck fractures. Many factors play roles in determining the treatment method for femoral neck fractures, such as the age of the patient, the time from the fracture to the treatment, the type of fracture, the quality of the bone, the patient's activity status before the fracture, the presence of other comorbidities, and the patient's mental status. The primary goal in treatment should be to mobilize the patient as soon as possible to return to prefracture life and to protect the patient from possible complications (18,19). After 65 years of age, hemiarthroplasty is the most common treatment modality for femoral neck fractures. World Health Organization (WHO) data indicate that the number of patients older than 65 years will increase by 88% in the next 25 years (20,21). According to data from our country, life expectancy worldwide was 69 years in the period 2010-2015. Life expectancy in our country for the period 2010-2015 was 74.6 years. According to estimates for the period 2045-2050, life expectancy worldwide is expected to reach 76 years. In Turkey, the life expectancy in the same period is 78.5 years. According to the same data, the proportion of individuals older than 65 years in the total population of Turkey is 7.5%. According to population projections, this rate is estimated to increase to 10.2% in 2023 and 20.8% in 2050 (22). In elderly individuals, femoral neck fracture occurs as a result of low-energy trauma at a rate of 78-96%, and this condition is frequently caused by simple falls (23). Femoral neck fracture is more common in women in the elderly population, and studies comparing the female-to-male ratio have shown female dominance, although at different levels. These data are similar to the data in our study. The reasons for the higher incidence of femoral neck fractures in women include being less active, being deprived of estrogen after menopause and lacking replacement, and osteoporosis being more effective. Another reason for the increase in this rate may be the predominance of women in the elderly population (24).

The success of the treatment depends on the reduction and stability of the fracture rather than the chosen fixation method. The aim of internal fixation of these fractures with sliding plates is to protect the patient's hip joint and prevent complications that may occur with the prosthesis. Partial prosthesis application allows early load bearing in the advanced age group without waiting for the fracture healing process (25,26). In our study, a statistically significant difference was found between mortality rates and the type of surgery (implant) and anesthesia, but no significant difference was found between fracture type and sex.

Surgical treatment of hip fractures should be performed as soon as possible. Currently, osteosynthesis and arthroplasty methods are preferred for the surgical treatment of femur fractures in the intertrochanteric region (27). However, a more important point is that patients should be properly prepared for surgery, and surgery should be performed as soon as possible.

Surgical treatment of hip fractures should be performed as soon as possible. Currently, osteosynthesis and arthroplasty methods are preferred for the surgical treatment of femur fractures in the intertrochanteric region (27). However, a more important point is to prepare the patient properly for surgery and to operate as soon as possible. In a retrospective study of 406 patients in the literature, the time to surgery and mortality rate were compared. They found that the annual mortality rate was 34% for those operated within the first 24 hours, 6% for those operated on the second day, 4.8% for those operated on the third day, 5.5% for those operated on the fourth day and 11% for those operated on the fifth day. According to these results, the annual mortality rate was significantly greater in patients who underwent surgery in the first 24 hours than in those who did not (28). In our study, there was no statistically significant difference in hospitalization or surgery duration (days), time between surgery and discharge (days), or mortality rate; however, these two durations were similar. We think that this is related to the early deterioration of body balance in patients after hip fracture. It is important that patients are physiologically stable and that their dehydration is corrected. Preoperative medical evaluation should be performed in detail in the first 12-24 hours after trauma, and the patient should be operated on after optimal surgical conditions are provided (28).

In the literature, 1-month mortality was found to be 6.4% in patients who underwent spinal anesthesia and 9.4% in patients who underwent general anesthesia, and this was associated with decreased early mortality (29). Similar results were obtained in our study, and a statistically significant difference was found between the mortality rate and type of anesthesia. Eighty-four percent of those who died within one month and 86.2% of those who did not die within one month were anesthetized via spinal anesthesia (30). However, controversy continues in the literature, and some studies argue that the type of anesthesia used does not affect mortality.

CONCLUSION

In conclusion, hip fractures are serious conditions with morbid and fatal consequences, especially for elderly patients. An increase in life expectancy has led to an increase in the number of elderly patients, and the incidence of hip fractures has increased accordingly. 8.1% of patients who underwent surgery after hip fracture died within one month. We believe that the type of surgery performed affects mortality. In our study, no deaths occurred within one month in patients who underwent total hip replacement or dynamic condyle screw placement. According to the results of our study, the spinal anesthesia method may increase mortality, and studies in larger series are needed in this regard. Although there was no statistical significance between mortality and length of hospitalization in our study, a shorter length of hospitalization may decrease the mortality rate.

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M.A., Z.O.K., C.T.; Writing the Article: V.U., Z.Ö.; Critical Review: Y.T., Z.O.K.

REFERENCES

1. Karlsson Å, Lindelöf N, Olofsson B, Berggren M, Gustafson Y, Nordström P, et al. Effects of geriatric interdisciplinary home rehabilitation on independence in activities of daily living in older people with hip fracture: a randomized controlled trial. Arch Phys Med Rehabil. 2020; 101(4): 571-8.
2. Inoue T, Maeda K, Nagano A, Shimizu A, Ueshima J, Murotani K, et al. Undernutrition, sarcopenia, and frailty in fragility hip fracture: advanced strategies for improving clinical outcomes. Nutrients. 2020; 12(12).
3. Montero-Odasso MM, Kamkar N, Pieruccini-Faria F, Osman A, Sarquis-Adamson Y, Close J, et al. Evaluation of clinical practice guidelines on fall prevention and management for older adults: A systematic review. JAMA Netw Open. 2021; 4(12): e2138911.
4. Dwyer JG, Reynoso JF, Seevers GA, Schmid KK, Muralidhar P, Konigsberg B, et al. Assessing preoperative frailty utilizing validated geriatric mortality calculators and their association with postoperative hip fracture mortality risk. Geriatr Orthop Surg Rehabil. 2014; 5(3): 109-15.
5. Pallardo Rodil B, Gómez Pavon J, Menendez Martínez P. Hip fracture mortality: Predictive models. Med Clin (Barc). 2020; 154(6):221-31.
6. Guzon-Illescas O, Perez Fernandez E, Crespi Villarias N, Quiros Donate FJ, Pena M, Alonso-Blas C, et al. Mortality after osteoporotic hip fracture: incidence, trends, and associated factors. J Orthop Surg Res. 2019; 14(1): 203.
7. Mattisson L, Bojan A, Enocson A. Epidemiology, treatment and mortality of trochanteric and subtrochanteric hip fractures: data from the Swedish fracture register. BMC Musculoskelet Disord. 2018; 19(1): 369.
8. Guerra MT, Viana RD, Feil L, Feron ET, Maboni J, Vargas AS. One-year mortality of elderly patients with hip fracture surgically treated at a hospital in Southern Brazil. Rev Bras Ortop. 2017; 52(1): 17-23.
9. Ribeiro TA, Premaor MO, Larangeira JA, Brito LG, Luft M, Guterres LW, et al. Predictors of hip fracture mortality at a general hospital in South Brazil: an unacceptable surgical delay. Clinics (Sao Paulo). 2014; 69(4): 253-8.
10. Karres J, Zwiers R, Eerenberg JP, Vrouenraets BC, Kerkhoffs G. Mortality prediction in hip fracture patients: physician assessment versus prognostic models. J Orthop Trauma. 2022; 36(11): 585-92.
11. Barceló M, Torres OH, Mascaro J, Casademont J. Hip fracture and mortality: study of specific causes of death and risk factors. Arch Osteoporos. 2021; 16(1): 15.
12. LeBlanc KE, Muncie HL, Jr., LeBlanc LL. Hip fracture: diagnosis, treatment, and secondary prevention. Am Fam Physician. 2014; 89(12): 945-51.
13. Bhandari M, Swiontkowski M. Management of Acute Hip Fracture. N Engl J Med. 2017; 377(21): 2053-62.
14. Chang SM, Hou ZY, Hu SJ, Du SC. Inter trochanteric femur fracture treatment in asia: what we know and what the world can learn. Orthop Clin North Am. 2020; 51(2): 189-205.
15. Brüggemann H, Dalen I, Bache-Mathiesen LK, Fenstad AM, Hallan G, Fosse L. Incidence and risk factors of intraoperative periprosthetic femoral fractures during primary total hip arthroplasty: 218,423 cases reported to the Norwegian Arthroplasty Register between 1987 and 2020. Acta Orthop. 2022; 93: 405-12.
16. Chen DX, Yang L, Ding L, Li SY, Qi YN, Li Q. Perioperative outcomes in geriatric patients undergoing hip fracture surgery with different anesthesia techniques: A systematic review and meta-analysis. Medicine (Baltimore). 2019; 98(49): e18220.
17. Saul D, Riekenberg J, Ammon JC, Hoffmann DB, Sehmisch S. Hip fractures: therapy, timing, and complication spectrum. Orthop Surg. 2019; 11(6): 994-1002.
18. Griffiths R, Babu S, Dixon P, Freeman N, Hurford D, Kelleher E, et al. Guideline for the management of hip fractures 2020: Guideline by the Association of Anaesthetists. Anaesthesia. 2021; 76(2): 225-37.
19. McDonough CM, Harris-Hayes M, Kristensen MT, Overgaard JA, Herring TB, Kenny AM, et al. Physical therapy management of older adults with hip fracture. J Orthop Sports Phys Ther. 2021; 51(2): Cpg1-cpg81.
20. Li L, Bennett-Brown K, Morgan C, Dattani R. Hip fractures. Br J Hosp Med (Lond). 2020; 81(8): 1-10.
21. Veronese N, Maggi S. Epidemiology and social costs of hip fracture. Injury. 2018; 49(8): 1458-60.
22. Okkaoglu MC, Özdemir M, Şeşen H, Taşkesen A, Demirkale İ, Altay M. Yaşlılarda Kalça kırıklarının epidemiyolojik özelliklerinin retrospektif analizi. Akademik Araştırma Tıp Dergisi. 2016; 1(1): 17-23.
23. Nasiri Sarvi M, Luo Y. Sideways fall-induced impact force and its effect on hip fracture risk: a review. Osteoporos Int. 2017; 28(10): 2759-80.
24. Lim SK, Beom J, Lee SY, Kim BR, Chun SW, Lim JY, et al. Association between sarcopenia and fall characteristics in older adults with fragility hip fracture. Injury. 2020; 51(11): 2640-7.
25. Kuiper BW, Graybill S, Tate JM, Kaufman N, Bersabe D. After the fall: improving osteoporosis treatment following hip fracture. Osteoporos Int. 2018; 29(6): 1295-301.
26. Cheung WH, Miclau T, Chow SK, Yang FF, Alt V. Fracture healing in osteoporotic bone. Injury. 2016; 47 Suppl 2: S21-6.
27. Seong YJ, Shin WC, Moon NH, Suh KT. Timing of hip-fracture surgery in elderly patients: literature review and recommendations. Hip Pelvis. 2020; 32(1): 11-6.
28. Nguyen ET, Posas-Mendoza T, Siu AM, Ahn HJ, Choi SY, Lim SY. Low rates of osteoporosis treatment after hospitalization for hip fracture in Hawaii. Osteoporos Int. 2018; 29(8): 1827-32.

29. Leibold C, Falbo R, Gupta A, Miller R, Pederson JM, Malpe M. A systematic review and meta-analysis of anesthesia type on hip fracture post-surgery outcomes. OTA Int. 2022; 5(3): e204.
30. Al-Husinat L, Al Sharie S, Araydah M, Al Modanat Z, Ismail MIA, Heilat HB, et al. Clinical characteristics of spinal versus general anaesthesia in older patients undergoing hip fracture repair surgery in jordan: a multicentre study. J Pers Med. 2023; 13(11): 1611.