e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(5); 1615-1618

Original Research Article

Predictors of Long-Term Survival after-Hip Fracture: A Five-Year Retrospective Study

Uday Prakash[1], Nand Kumar[2]

[1]Senior Resident, Department of Orthopaedics, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India

[2]Professor and HOD, Department of Orthopaedics, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India

Received: 25-02-2024 / Revised: 23-03-2024 / Accepted: 08-05-2024

Corresponding Author: Dr. Nand Kumar

Conflict of interest: Nil

Abstract:

Background: Hip fractures are a significant cause of morbidity and mortality in the elderly population. Identifying predictors of long-term survival after hip fractures is crucial for improving patient outcomes and guiding clinical interventions.

Aim: This study aims to identify and analyze the factors influencing five-year survival rates in patients who have sustained hip fractures.

Methods: A retrospective cohort study included 200 patients aged 60 years and older who had hip fractures and underwent surgical intervention. Patients with periprosthetic or pathological fractures and multiple fractures were excluded. Data were collected from hospital records and analyzed using SPSS version 21.0. The primary variables included time to surgery, one-year mortality, and functional recovery assessed by the Barthel Index. Statistical analyses involved Kaplan-Meier survival analysis and Cox proportional hazards models.

Results: The study found that early surgery within 24 hours significantly reduced the one-year mortality rate to 10% and improved functional recovery, with 60% of patients achieving good recovery scores. In contrast, delayed surgery beyond 48 hours was associated with a higher mortality rate of 30% and poorer functional outcomes, with only 25% achieving good recovery. Complications such as pneumonia and urinary tract infections were more common in patients with delayed surgery. Statistical analysis confirmed that delayed surgery is an independent predictor of higher mortality and poorer functional recovery, emphasizing the importance of early surgical intervention for hip fracture patients.

Conclusion: The study identified several key predictors of long-term survival after hip fractures. Early surgical intervention and comprehensive post-operative rehabilitation significantly improve survival outcomes.

Recommendations: Clinicians should prioritize timely surgery and comprehensive post-operative care for hip fracture patients to enhance long-term survival. Further research is needed to develop targeted interventions for high-risk populations.

Keywords: Hip Fractures, Long-Term Survival, Predictors, Retrospective Study, Elderly Patients.

Introduction

Hip fractures represent a major public health concern, particularly among the elderly population, due to their significant impact on morbidity, mortality, and healthcare costs. The incidence of hip fractures is expected to rise with the aging global population, posing a substantial burden on healthcare systems worldwide. Hip fractures often result in prolonged hospital stays, substantial rehabilitation needs, and a high risk of complications, including loss of mobility and independence. Understanding the factors that influence long-term survival in hip fracture patients is critical for improving patient outcomes and developing effective healthcare strategies [1].

Hip fractures are among the most severe types of fractures in older adults, commonly resulting from low-energy falls due to osteoporosis and frailty. These fractures are associated with a high mortality rate, particularly within the first-year post-injury, with studies indicating that up to 30% of patients may not survive beyond the first year. Additionally, the quality of life for survivors can be significantly compromised, with many experiencing persistent pain, reduced physical function, and a diminished ability to perform daily activities. This highlights the urgent need for effective management strategies and interventions to enhance survival and quality of life in this vulnerable population [2].

While numerous studies have examined short-term outcomes following hip fractures, there is a relative paucity of research focusing on long-term survival

and its predictors. Most existing research has concentrated on immediate postoperative complications and short-term mortality, often overlooking the critical factors that contribute to sustained survival over several years. Identifying these long-term predictors is essential for tailoring interventions that not only address immediate postoperative needs but also support sustained recovery and survival. Moreover, understanding these factors can inform healthcare policies and resource allocation to better support this high-risk group [3].

Evidence suggests that early surgical intervention and comprehensive post-operative care are pivotal in improving outcomes for hip fracture patients. Early surgery, typically within 48 hours of injury, has been associated with reduced mortality and improved functional recovery. Additionally, comprehensive post-operative rehabilitation, including physical therapy and nutritional support, plays a crucial role in promoting recovery and enhancing long-term survival. However, the extent to which these factors influence five-year survival rates remains underexplored, necessitating further investigation to optimize treatment protocols and care pathways [4].

This study aims to fill the existing knowledge gap by identifying and analyzing the predictors of five-year survival in patients who have sustained hip fractures. By conducting a retrospective cohort study, we seek to determine the impact of various demographic, clinical, and treatment-related factors on long-term survival outcomes. The findings from this study are expected to provide valuable insights into the management of hip fracture patients, guiding clinical practice and informing healthcare policies to improve survival rates and quality of life for this vulnerable population.

Methodology

Study Design: A retrospective cohort study design was employed to investigate the impact of early surgical intervention on mortality and functional recovery in hip fracture patients.

Study Setting: The study was conducted at Darbhanga Medical College, Darbhanga, over a duration of five years, from 2017 to 2021.

Participants: The study included a total of 200 patients who were admitted with hip fractures.

Inclusion and Exclusion Criteria

Inclusion Criteria:

1. Patients aged 60 years and older.
2. Patients who sustained hip fractures due to low-energy falls.
3. Patients who underwent surgical intervention within the study duration.

Exclusion Criteria:

1. Patients with periprosthetic or pathological fractures.
2. Patients with multiple fractures.
3. Patients who did not undergo surgery.

Bias: To minimize selection bias, all consecutive eligible patients within the study period were included. Recall bias was mitigated by using hospital records for data collection.

Variables: The primary variables included time to surgery, mortality rate within one year, and functional recovery assessed by the Barthel Index. Secondary variables included patient demographics, comorbidities, and complications.

Data Collection: Data were collected retrospectively from hospital records, including patient demographics, medical history, time to surgery, postoperative complications, and outcomes.

Procedure: Patients were grouped based on the timing of their surgery: within 24 hours, 24-48 hours, and beyond 48 hours. Functional recovery was assessed using the Barthel Index at one year post-surgery. Mortality data were obtained from hospital records and follow-up visits.

Statistical Analysis: Statistical analysis was performed using SPSS version 21.0. Descriptive statistics were used to summarize the patient demographics and baseline characteristics. Kaplan-Meier survival analysis was conducted to estimate the survival probabilities, and Cox proportional hazards models were used to identify predictors of mortality. The impact of surgery timing on functional recovery was analyzed using ANOVA.

Results

Patient Demographics and Baseline Characteristics: A total of 200 patients were included in the study. The mean age was 74.5 years (SD = 7.8), with a range from 60 to 89 years. There were 120 females (60%) and 80 males (40%). The majority of patients (70%) had at least one comorbidity, with hypertension (45%) and diabetes mellitus (30%) being the most common.

Time to Surgery

Patients were grouped based on the time to surgery:

- Group 1 (surgery within 24 hours): 70 patients (35%)
- Group 2 (surgery within 24-48 hours): 90 patients (45%)
- Group 3 (surgery after 48 hours): 40 patients (20%)

Mortality Rate

The overall one-year mortality rate was 18%. The mortality rates for each group were:

- Group 1: 10% (7 patients)
- Group 2: 18% (16 patients)
- Group 3: 30% (12 patients)

Functional Recovery

Functional recovery was assessed using the Barthel Index, with scores categorized as poor (0-20), moderate (21-60), and good (61-100). The distribution of functional recovery scores at one year post-surgery was as follows:

Time to Surgery	Poor Recovery	Moderate Recovery	Good Recovery
Within 24 hours	10% (7)	30% (21)	60% (42)
24-48 hours	20% (18)	40% (36)	40% (36)
After 48 hours	35% (14)	40% (16)	25% (10)

Complications: The overall complication rate was 22.5%, with the most common complications being pneumonia (10%) and urinary tract infections (7.5%).

Complication	Frequency	Percentage
Pneumonia	20	10%
Urinary Tract Infection	15	7.5%
Deep Wound Infection	10	5%
Pulmonary Embolism	5	2.5%

Kaplan-Meier survival analysis showed a significant difference in survival probabilities among the three groups (Log-rank test, $p < 0.01$). Cox proportional hazards model identified delayed surgery (beyond 48 hours) as an independent predictor of higher mortality (HR = 2.3, 95% CI: 1.5-3.5, $p < 0.01$). ANOVA analysis demonstrated a significant impact of surgery timing on functional recovery scores ($F(2,197) = 5.67$, $p < 0.01$).

The study found that early surgical intervention within 24 hours of hip fracture significantly reduced the one-year mortality rate and improved functional recovery compared to delayed surgery. Patients who underwent surgery within 24 hours had the lowest mortality rate (10%) and the highest percentage of good functional recovery (60%). Delayed surgery beyond 48 hours was associated with the highest mortality rate (30%) and the poorest functional outcomes, with only 25% achieving good recovery.

Discussion

Complication rates were also higher in patients with delayed surgery, particularly for pneumonia and urinary tract infections. The statistical analysis confirmed that delayed surgery is an independent predictor of higher mortality and poorer functional recovery.These findings underscore the importance of early surgical intervention and comprehensive postoperative rehabilitation to improve survival and functional outcomes in hip fracture patients. Prompt surgical management within 24 hours should be prioritized to optimize patient recovery and reduce mortality.

A study observed that early surgery (within two days) was associated with lower one-year mortality in hip fracture patients, emphasizing that delays beyond 48 hours significantly increased mortality rates (5). Likewise a research identified that patients with trochanteric fractures who underwent early surgery had better functional outcomes six months post-fracture compared to those with delayed surgery. Pre-fracture ambulation ability was a significant predictor of recovery (6). Scientists demonstrated that early ambulation within the first three days post-surgery significantly reduced 30-day mortality, underscoring the benefits of early postoperative mobilization for improving survival rates (7) .

Conclusion

The study underscores the critical importance of early surgical intervention and timely postoperative mobilization in hip fracture patients. Early surgery, particularly within the first 48 hours, is associated with significantly lower mortality rates and better functional outcomes. Prompt ambulation within the first three days post-surgery further enhances survival rates. These findings advocate for prioritizing rapid surgical care and early rehabilitation efforts to improve patient recovery and reduce mortality in elderly hip fracture patients.

References

1. Papadimitriou N, Tsilidis KK, Orfanos P, Benetou V, Ntzani EE, Soerjomataram I, Künn-Nelen A, Pettersson-Kymmer U, Eriksson S, Brenner H, Schöttker B. Burden of hip fracture using disability-adjusted life-years: a pooled analysis of prospective cohorts in the CHANCES consortium. The Lancet Public Health. 2017 May 1;2(5):e239-46.

2. Giummarra M, Ekegren C, Gong J, Simpson P, Cameron P, Edwards E, Gabbe B. Twelve month mortality rates and independent living in people aged 65 years or older after isolated hip fracture: A prospective registry-based study. Injury. 2019.
3. Morri M, Ambrosi E, Chiari P, Magli AO, Gazineo D, D'Alessandro F, Forni C. Predictors of long-term survival after hip fractures: A 5-year results of a retrospective cohort study. International Journal of Health and Clinical Research. 2019.
4. El Alami R, Jalal M, Mouncef B, Allah BR, Kharmaz M, Lamrani MO, Salah BM. Minimally Invasive Surgery in Total Hip Arthroplasty: Analysis of Clinical Results and Practical Implications. SAS J Med. 2023 Jul; 7:741-54.
5. Colais P, Di Martino M, Fusco D, Perucci C, Davoli M. The effect of early surgery after hip fracture on 1-year mortality. BMC Geriatrics. 2015;15:141.
6. Takahashi A, Naruse H, Kitade I, Shimada S, Tsubokawa M, Kokubo Y, et al. Functional outcomes after the treatment of hip fracture. PLoS ONE. 2020;15(8)
7. Heiden JJ, Goodin SR, Mormino MA, Siebler JC, Putnam SM, Lyden E, et al. Early ambulation after hip fracture surgery is associated with decreased 30-day mortality. J Am Acad Orthop Surg. 2020;28(1):1-7.