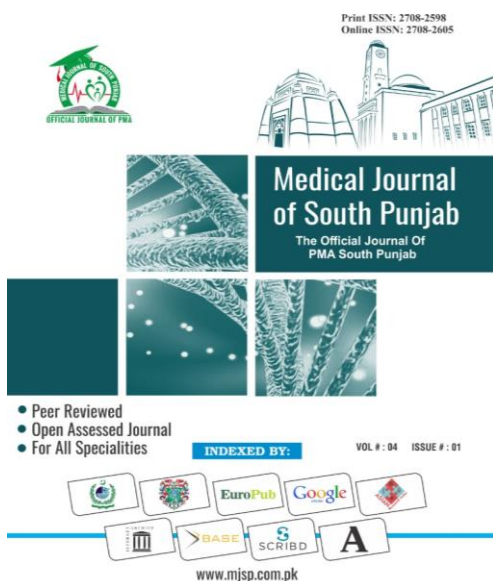


ISSN (E): 2708-2601

ISSN (P): 2708-2598

**Medical Journal of South Punjab**  
Article DOI:10.61581/MJSP.VOL04/02/04  
Volume 4, Issue 2, 2023



## **Influence of Timing of Surgery on Surgical Outcomes of Elderly Hip Fractures**

### **Publication History**

Received: Oct, 10 2023    Revised: Nov 7, 2023  
Accepted: Nov 10, 2023    Published: Dec 30, 2023

### **Authors and Affiliation:**

Gauhar Nawaz Khan<sup>1</sup>, Hassan Raza Khosa<sup>2</sup>,  
Umair Ahmad<sup>3</sup>, Muhammad Naqash Khan<sup>4\*</sup>,  
Syed Zohaib Haider<sup>5</sup>, Shahid Javed<sup>6</sup>  
<sup>1,2,3,4,5,6</sup> Recep Tayyap Erdogan Hospital,  
Muzaffargarh, Pakistan

\*Corresponding Author Email:

[naqashrth@gmail.com](mailto:naqashrth@gmail.com)

### **Copyright & Licensing:**



Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a [Creative Commons Attribution \(CC-BY\) 4.0 License](https://creativecommons.org/licenses/by/4.0/) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

### **Conflict of Interest:**

Author(s) declared no conflict of interest.

### **Acknowledgment:**

No Funding received.

**Citation:** Khan GN, Khosa HR, Ahmad U, Khan MN, Haider SH, Javed S. Comparison of Antibiotic Therapy versus Influence of Timing of Surgery on Surgical Outcomes of Elderly Hip Fractures. Medical Journal of South Punjab. 2023 Dec 30; 4(2):7-13.

Please scan me to access online.



An official publication of  
**Medteach Private Limited, Multan, Pakistan.**  
Email: [farman@mjsp.com.pk](mailto:farman@mjsp.com.pk), Website: <https://mjsp.com.pk/index.php/mjsp>



## Influence of Timing of Surgery on Surgical Outcomes of Elderly Hip Fractures

Gauhar Nawaz Khan<sup>1</sup>, Hassan Raza Khosa<sup>2</sup>, Umair Ahmad<sup>3</sup>, Muhammad Naqash Khan<sup>4\*</sup>, Syed Zohaib Haider<sup>5</sup>, Shahid Javed<sup>6</sup>

<sup>1,2,3,4,5,6</sup> Recep Tayyap Erdogan Hospital, Muzaffargarh, Pakistan

\*Corresponding Author Email: [naqashrth@gmail.com](mailto:naqashrth@gmail.com)

### ABSTRACT

**Objective:** To determine the effect of timing of surgery on surgical outcomes of hip fractures in elderly patients.

**Methods:** This Cross Sectional study including 150 elderly patients who presented in Indus RTEH campus Muzaffargarh and underwent surgical management for hip fractures was conducted from 1<sup>st</sup> January-2021 to 30<sup>th</sup> Dec-2022. The patients were labeled to have early surgery if they underwent surgery within 24 hours of surgery and delayed surgery if they underwent surgery after 24 hours of fracture. Details regarding surgical procedure, duration of surgery and intraoperative blood loss was determined for each patient. The patients were followed for 30 days after surgery. Occurrence of pressure sores, cardiovascular events, implant complications was determined. 30-day operative mortality was also noted.

**Results:** Mean age of patients was  $72.8 \pm 7.9$  years in early and  $74.3 \pm 8.2$  years in delayed group. Majority patients were females with frequency of 70.6% (53) in early and 76% (57) in delayed group ( $p$ -value 0.67). Bed sores occurred in 1 (1.3%) patient in early group and in 5 (6.7%) patients in delayed group with  $p$ -value 0.09. UTI occurred in 4 (5.3%) patients in early group versus in 9 (12.0%) patients in delayed group ( $p$ -value 0.14). Length of stay was significantly prolonged in delayed group;  $7.5 \pm 2.3$  days versus  $6.1 \pm 1.8$  days in early group,  $p$ -value 0.001. 30 days mortality rate was 7 (9.3%) in early group versus 9 (12.0%) in delayed group,  $p$ -value 0.59.

**Conclusion:** Early surgical intervention in elderly patients with hip fractures is beneficial as it significantly lower the risk of post-operative complications and results in early discharge of patient from the hospital.

**Keywords:** Elderly hip fractures, 30-day mortality, surgical intervention, Length of stay.

## 1. INTRODUCTION

Because of the increased risk of morbidity and mortality that is connected with hip fractures, there is a substantial public health concern regarding aged populations in both Europe and the United States. It is common knowledge that the annual incidence of hip fractures rises with age, and it is also common knowledge that the risk of hip fractures is greater in women than it is in males.<sup>1,2</sup> In the United States, the incidence of hip fractures ranges from 0.2% in women aged 60-64 years to 2.5% in women aged 85 years or older.<sup>3</sup> This wide variation can be attributed to the fact that hip fractures are more common in older women. There is a wide range of variation in the annual incidence of hip fractures among elderly women in Europe, with the range being anywhere from 0.5% to 1.6% each year (5-7).<sup>4,5</sup> It's interesting to note that the risk of hip fractures in males is around half of what it is in women, although this difference exists.<sup>6</sup>

Hip fractures are a major cause of concern for older people because they can result in permanent reliance and immobility, both of which have a negative impact on the quality of life of the patient. In addition, the costs associated with treating these injuries can place a strain on healthcare systems and general societal budgets. Hip fractures are one of the leading causes of death among the elderly, with mortality rates ranging from 14% to 36% within one year of the injury.<sup>7-9</sup> This is especially true in the most severe instances. In addition, older individuals have a five- to eight-fold increased chance

of passing away within the first three months after suffering a hip fracture.<sup>10</sup> The prognosis of older people with hip fractures can be affected by a number of factors, including age, gender, comorbidities, anticoagulant medication, and general physical health status at the time of the injury.<sup>11</sup> It is also considered that the timing of surgery plays a significant effect in one's chances of surviving. Within 24 to 48 hours after admission, surgical treatment of acute hip fractures is recommended by international clinical practice standards; nevertheless, these recommendations are still the topic of contentious arguments.<sup>12,13</sup> However, Still many surgeons believe that early surgery may result in higher risk of peri-operative complications as there is no much time for pre-operative optimization of patient's condition.<sup>5</sup> In this study, we determined the effect of timing of surgery on surgical outcomes of hip fractures in elderly patients. This study will guide us to adopt local protocols and alleviate the literature gap among this generation.

## 2. METHODOLOGY

This study including 150 elderly patients who underwent surgical management for hip fractures was conducted from January-2021 to Dec-2022. The study was conducted in Indus Hospital (RTEH) Campus Muzaffargarh. Patients who underwent surgical management (such as hip screws, nails, or prosthesis insertion), age >65 years, both male and female were included. While patients having pathologic fractures and planned for medical management and those

not fit for surgical intervention were excluded. The sampling technique was Non-Probability Sampling. The sample size will be determined based on power calculations to ensure adequate statistical power. The sample size is calculated using the sample size calculator with confidence interval of 90%. The hospital's ethics committee examined and approved the protocols for both the study and the recruitment of participants for the clinical trial. The ethical approval number by Institutional Review Board is IHHN\_IRB\_2023\_08\_016. A waiver for informed consent was sought from IRB as study was retrospective and based on anonymized hospital records.

In all patients, pre-operative baseline variables were assessed. The patients were labeled to have early surgery if they underwent surgery within 24 hours of surgery and delayed surgery if they underwent surgery after 24 hours of fracture. Details regarding surgical procedure, duration of surgery and intra-operative blood loss was determined for each patient.

The patients were followed for 30 days after surgery. Occurrence of pressure sores, cardiovascular events implant complications such as dislocation, misalignment or implant breakage was determined. 30-day operative mortality was also noted for each patient.

The hospital's ethics committee examined and approved the protocols for both the study and the recruitment of participants for the clinical trial. SPSS was utilized to conduct all statistical analyses.

The significance threshold was set at  $p = 0.05$ . The primary predictor variable examined was the time between the fracture event and the commencement of surgery, known as time-to-surgery. This interval was categorized into two levels: Level I encompassed intervals of 24 hours or less, whereas Level II comprised intervals exceeding 24 hours. Based on these groups, patient characteristics, fracture type, anesthetic and surgical procedures, post-operative complications, and 30-day all-cause mortality were stratified for analysis. Categorical variables were compared using the chi-square test, while independent sample t-tests were employed for continuous comparisons.

### 3. RESULTS

Mean age of patients was  $72.8 \pm 7.9$  years in early and  $74.3 \pm 8.2$  years in delayed group. Majority patients were females with frequency of 70.6% (53) in early and 57 (76%) in delayed group ( $p$ -value 0.67). there was no significant difference in comorbidities such as smoking, obesity, diabetes and COPD between the groups. There were 54 (72%) patients having ASA III-IV in early and 53 (70.6%) in delayed group ( $p$ -value 0.85). Femur neck was the commonest fractures with frequency of 57.3% (43) in early versus 60% (45) patients in delayed group, followed by trochanteric fractures; presented in 37.3% (28) patients in early group versus 36.0% (27) in delayed group,  $p$ -value 0.90 (Table 1).

**Table-I**  
**Baseline Characteristics**

Characteristics	Early group (n=75)	Delayed group (N=75)	P-value
Age	72.8±7.9	74.3±8.2	0.25
Obesity (%)	15 (20.0%)	13 (17.3%)	0.67
Female Gender (%)	53 (70.6%)	57 (76%)	0.46
Smoking (%)	11 (14.6%)	13 (17.3%)	0.65
Diabetes (%)	27 (36%)	28 (37.3%)	0.86
COPD (%)	10 (13.3%)	09 (12.0%)	0.80
<b>ASA grade</b>			
I-II (%)	21 (28%)	22 (29.3%)	0.85
III-IV (%)	54 (72%)	53 (70.6%)	
<b>Type of Fracture</b>			
Femoral neck (%)	43 (57.3%)	45 (60.0%)	0.90
Trochanteric (%)	28 (37.3%)	27 (36.0%)	
Subtrochanteric (%)	04 (5.3%)	03 (4.0%)	

On comparison of operative and post-operative complications in early and delayed group, frequency of occurrence of bed sores, urinary tract infections (UTI) were higher in delayed group. Bed sores occurred in 1 (1.3%) patient in early group and in 5 (6.7%) patients in delayed group with p-value 0.09. UTI occurred in 4 (5.3%) patients in early group versus in 9 (12.0%) patients in delayed group (p-value 0.14). Length of stay was significantly prolonged in delayed group; 7.5±2.3 days versus 6.1±1.8 days in early group, p-value 0.001. 30 days mortality rate was 7 (9.3%) in early group versus 9 (12.0%) in delayed

group, p-value 0.59 (Table 2).

**Table-II**  
**Study Outcomes**

Characteristic	Early Surgery (n=75)	Delayed Surgery (N=75)	P-value
Need of Blood Transfusion (%)	39 (52%)	41 (54.7%)	0.74
Hematoma (%)	4 (5.3%)	4 (5.3%)	1.0
Pressure Sores (%)	1 (1.3%)	5 (6.7%)	0.09
Deep SSIs (%)	0 (0.0%)	2 (2.7%)	0.49
Pulmonary Embolism (%)	0 (0.0%)	1 (1.3%)	1.0
UTI (%)	04 (5.3%)	09 (12.0%)	0.14
Need for Re-operation (%)	2 (2.7%)	3 (4.0%)	0.64
Implant Complications	2 (2.7%)	2 (2.7%)	1.0
Length of Stay	6.1±1.8	7.5±2.3	0.001
30-day mortality (%)	7 (9.3%)	9 (12.0%)	0.59

#### 4. DISCUSSION

Hip fractures are a significant health concern among elderly individuals, often resulting in substantial morbidity and mortality. The timing of surgery plays a crucial role in the management of these fractures. There has been considerable debate regarding the optimal timing of surgery for elderly hip fracture patients.

Several studies have demonstrated the benefits of early surgery in elderly hip fracture patients. Early surgical intervention, typically within 24-48 hours of admission, has been associated with reduced complications and improved

outcomes. A systematic review by Khan et al. analyzed multiple studies and reported that early surgery significantly reduced the risk of postoperative complications, such as pneumonia and pressure ulcers. It also decreased the length of hospital stay and improved functional outcomes.<sup>14</sup>

Despite the study not demonstrating significant improvements in pulmonary function after surgery with the use of the Acapella device in comparison to incentive spirometry, patient feedback revealed a substantial preference for the Acapella device due to its perceived comfort and ease of use. This aligns with the observed preference for the Acapella Delayed surgery, typically beyond 48 hours of admission, may have detrimental effects on elderly hip fracture patients. Prolonged delays can lead to various complications, including increased pain, immobility, and higher rates of medical complications. A study by Shiga et al. investigated the impact of timing of surgery on 30-day mortality and reported that delayed surgery (>48 hours) was associated with a higher risk of mortality in elderly patients with hip fractures.<sup>15</sup> Another study by Bottle et al. analyzed a large dataset and found that patients who experienced a delay of more than 4 days for surgery had increased mortality rates and higher rates of complications, including myocardial infarction and pneumonia.<sup>16</sup> Furthermore, a study by Pioli et al. demonstrated that surgical delay exceeding 48 hours was associated with an increased risk of postoperative medical complications and prolonged hospitalization.<sup>17</sup>

In present study we found that early surgical intervention is advantageous over delayed intervention in-terms of lower occurrence of pressure sores, UTI and hospital stay. Our study results were supported by the study of Van et al. who also reported significantly lower incidence of blood sores and UTI in early surgery group. However, in their study there was no significant difference in mean hospital stay between the groups.<sup>18</sup> Smektala et al. also reported that early surgery is beneficial as it is associated with significant lower risk of operative and post-operative complications.<sup>19</sup>

Determining the optimal timing of surgery for elderly hip fracture patients requires considering various factors. The patient's overall health status, comorbidities, preoperative optimization, and availability of surgical resources should be taken into account. Frail elderly patients may require additional time for preoperative optimization to minimize surgical risks.

## 5. CONCLUSION

Early surgical intervention in elderly patients with hip fractures is beneficial as it significantly lowers the risk of post-operative complications and results in early discharge of patient from the hospital.

## REFERENCES

1. Swayambunathan J, Dasgupta A, Rosenberg PS, Hannan MT, Kiel DP, Bhattacharyya T. Incidence of Hip Fracture Over 4 Decades in the

- Framingham Heart Study. *JAMA internal medicine*. 2020;180(9):1225-31.
- Werner M, Macke C, Gogol M, Krettek C, Liodakis E. Differences in hip fracture care in Europe: a systematic review of recent annual reports of hip fracture registries. *Eur J Trauma Emerg Surg*. 2022;48(3):1625-38.
  - Ettinger B, Black DM, Dawson-Hughes B, Pressman AR, Melton LJ, 3rd. Updated fracture incidence rates for the US version of FRAX. *Osteoporos Int*. 2010;21(1):25-33.
  - Leal J, Gray AM, Prieto-Alhambra D, Arden NK, Cooper C, Javaid MK, et al. Impact of hip fracture on hospital care costs: a population-based study. *Osteoporos Int*. 2016;27(2):549-58.
  - Klestil T, Röder C, Stotter C, Winkler B, Nehrer S, Lutz M, et al. Impact of timing of surgery in elderly hip fracture patients: a systematic review and meta-analysis. *Sci Rep*. 2018;8(1):13933.
  - Kanis JA, Odén A, McCloskey EV, Johansson H, Wahl DA, Cooper C. A systematic review of hip fracture incidence and probability of fracture worldwide. *Osteoporos Int*. 2012;23(9):2239-56.
  - Panula J, Pihlajamäki H, Mattila VM, Jaatinen P, Vahlberg T, Aarnio P, et al. Mortality and cause of death in hip fracture patients aged 65 or older: a population-based study. *BMC Musculoskelet Disord*. 2011;12:105.
  - Lizaur-Utrilla A, Martinez-Mendez D, Collados-Maestre I, Miralles-Muñoz FA, Marco-Gomez L, Lopez-Prats FA. Early surgery within 2 days for hip fracture is not reliable as healthcare quality indicator. *Injury*. 2016;47(7):1530-5.
  - Tolppanen AM, Taipale H, Tanskanen A, Tiihonen J, Hartikainen S. Comparison of predictors of hip fracture and mortality after hip fracture in community-dwellers with and without Alzheimer's disease - exposure-matched cohort study. *BMC Geriatr*. 2016;16(1):204.
  - Haentjens P, Magaziner J, Colón-Emeric CS, Vandenschueren D, Milisen K, Velkeniers B, et al. Meta-analysis: excess mortality after hip fracture among older women and men. *Ann Intern Med*. 2010;152(6):380-90.
  - Carpintero P, Caeiro JR, Carpintero R, Morales A, Silva S, Mesa M. Complications of hip fractures: A review. *World journal of orthopedics*. 2014;5(4):402-11.
  - Roberts KC, Brox WT, Jevsevar DS, Sevarino K. Management of hip fractures in the elderly. *J Am Acad Orthop Surg*. 2015;23(2):131-7.
  - Bhandari M, Swiontkowski M. Management of Acute Hip Fracture. *N Engl J Med*. 2017;377(21):2053-62.
  - Khan SK, Kalra S, Khanna A, Thiruvengada MM, Parker MJ. Timing of surgery for hip fractures: a systematic review of 52 published studies involving 291,413 patients. *Injury*. 2009;40(7):692-7.
  - Shiga T, Wajima Z, Ohe Y. Is

- operative delay associated with increased mortality of hip fracture patients? Systematic review, meta-analysis, and meta-regression. *Can J Anaesth.* 2008;55(3):146-54.
- 16.** Bottle A, Aylin P. Mortality associated with delay in operation after hip fracture: observational study. *BMJ.* 2006;332(7547):947-51.
- 17.** Pioli G, Lauretani F, Pellicciotti F, Pignedoli P, Bendini C, Davoli ML, et al. Modifiable and non-modifiable risk factors affecting walking recovery after hip fracture. *Osteoporos Int.* 2016;27(6):2009-16.
- 18.** van Rijckevorsel V, de Jong L, Verhofstad MHJ, Roukema GR. Influence of time to surgery on clinical outcomes in elderly hip fracture patients : an assessment of surgical postponement due to non-medical reasons. *The bone & joint journal.* 2022;104-b(12):1369-78.
- 19.** Smektala R, Endres HG, Dasch B, Maier C, Trampisch HJ, Bonnaire F, et al. The effect of time-to-surgery on outcome in elderly patients with proximal femoral fractures. *BMC Musculoskelet Disord.* 2008;9:171.
- 20.** Maalouf G, Bachour F, Hlais S, Maalouf NM, Yazbeck P, Yaghi Y, et al. Epidemiology of hip fractures in Lebanon: a nationwide survey. *Orthop Traumatol Surg Res.* 2013;99(6):675–80.