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ORIGINAL RESEARCH

To determine the outcome of Early Surgical treatment in geriatric individuals with hip fractures who presented to the Emergency Department

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ABSTRACT

Aim: To determine the outcome of Early Surgical treatment in geriatric individuals with hip fractures who presented to the Emergency Department. **Materials and Methods:** The primary aim of the study was to observe and analyze post-operative complications, recovery, and rehabilitation outcomes in elderly patients undergoing hip fracture surgery. The study included a cohort of 80 patients selected based on specific criteria. The inclusion criteria required patients to be between 65 and 90 years old and to have sustained a hip fracture necessitating surgical intervention. Exclusion criteria ruled out patients with multiple traumatic injuries, pre-existing chronic infections, or those who had undergone previous hip surgeries. **Results:** Post-operative complications were categorized into various types: 6.25% of patients developed infections, 12.5% experienced cardiovascular issues, 10% had respiratory problems, 7.5% had renal concerns, 5% had neurological disturbances, and 3.75% encountered gastrointestinal issues. Notably, 55% of the patients had no complications post-surgery. Functional recovery was assessed using the Harris Hip Score. The results were as follows: 25% of patients achieved an excellent score (90-100), 43.75% had a good score (80-89), 18.75% had a fair score (70-79), and 12.5% had a poor score (<70). These results show that the majority of patients (68.75%) experienced good to excellent functional recovery post-surgery, reflecting effective surgical and rehabilitative care.The mean scores across different domains were: Physical Functioning (65 ± 15), Role Physical (70 ± 20), Bodily Pain (60 ± 25), General Health (75 ± 10), Vitality (70 ± 15), Social Functioning (80 ± 10), Role Emotional (72 ± 18), and Mental Health (78 ± 12). **Conclusion:** The findings underscore the importance of comprehensive perioperative care to manage complications and enhance recovery outcomes in this vulnerable patient population. The results support the efficacy of total hip replacement and internal fixation surgeries in achieving favorable functional recovery and quality of life in elderly patients.

Keywords: Early Surgicaltreatment, Geriatric, hip fractures, Emergency Department

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INTRODUCTION

Hip fractures in elderly patients present a significant challenge to healthcare systems worldwide, primarily due to the high incidence, associated morbidity, and substantial healthcare costs. These fractures are often the result of low-energy falls and are commonly seen in individuals with underlying osteoporosis or other age-related degenerative bone diseases. The management of hip fractures in the elderly is complex, necessitating timely and effective medical and surgical interventions to improve outcomes and reduce the risk of complications.[1]Early surgical intervention is widely recognized as the gold standard in the treatment of hip fractures in elderly patients. Prompt surgery, typically within 24-48 hours of the injury, is associated with numerous benefits, including reduced pain, lower risk of complications, and improved functional recovery. Delays in surgical intervention can lead to adverse outcomes, including prolonged immobility, increased risk of thromboembolic events, pressure ulcers, and infections, all of which can significantly impact the patient's quality of life and overall prognosis.[2]The rationale for early surgical intervention is multifaceted. Firstly, it aims to minimize the period of immobilization, which is critical in preventing

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complications such as deep vein thrombosis, pulmonary embolism, and pneumonia. Immobilization can also exacerbate muscle wasting and weakness, further impeding the recovery process. By expediting surgical treatment, healthcare providers can facilitate early mobilization, which is crucial for maintaining muscle strength, joint function, and overall physical health.[3]Moreover, early surgical intervention is instrumental in pain management. Hip fractures are notoriously painful, and prolonged pain can lead to increased use of analgesics, which may have side effects, particularly in the elderly who often have multiple comorbidities. Surgical fixation of the fracture provides structural stability, significantly alleviating pain and reducing the need for potent pain medications. This, in turn, can help prevent the side effects associated with long-term analgesic use, such as gastrointestinal issues, renal impairment, and cognitive dysfunction.[4]From a functional recovery perspective, early surgery allows for a more structured and effective rehabilitation process. Rehabilitation is a cornerstone of recovery for hip fracture patients, aiming to restore mobility, independence, and quality of life. When surgery is performed promptly, patients can begin physical therapy sooner, which is essential for regaining strength and function. Delayed surgery, conversely, can lead to a prolonged recovery period and potentially permanent functional impairments.[5] The impact of early surgical intervention on mortality rates is also a critical consideration. Numerous studies have shown that delays in surgery are associated with higher mortality rates in elderly hip fracture patients. This increased risk is attributed to a combination of factors, including the complications of prolonged immobility and the physiological stress of an untreated fracture. Early surgical intervention helps mitigate these risks, contributing to better survival outcomes.[6]However, the decision to proceed with early surgery must be balanced with the patient's overall health status and readiness for surgery. Preoperative assessments are vital to identify any underlying conditions that may increase the risk of surgical complications. Conditions such as cardiovascular diseases, respiratory issues, and uncontrolled diabetes need to be managed appropriately before surgery to ensure the patient can tolerate the procedure. Multidisciplinary care involving orthopedic surgeons, anesthesiologists, geriatricians, and rehabilitation specialists is essential to optimize the patient's condition for surgery and subsequent recovery.[7]Postoperative care is equally important in ensuring favorable outcomes for elderly patients undergoing hip fracture surgery. Comprehensive postoperative management includes pain control, prevention of complications, and initiation of early rehabilitation. Monitoring for potential postoperative complications, such as infections, cardiovascular events, and thromboembolic incidents, is crucial in this patient population. Implementing protocols for early mobilization, nutritional support, and psychological counseling can significantly enhance recovery and quality of life.[8]

MATERIALS AND METHODS

This observational study was conducted at the Akash Institute of Medical Sciences & Research Center, Devanahalli, Bengaluru Rural District, from June 2021 to December 2023. The primary aim of the study was to observe and analyze post-operative complications, recovery, and rehabilitation outcomes in elderly patients undergoing hip fracture surgery.The study was approved by the institutional ethical committee. Informed written consent was obtained from all patients after explaining the study and the procedures involved. Patient confidentiality was maintained throughout the study.The study included a cohort of 80 patients selected based on specific criteria. The inclusion criteria required patients to be between 65 and 90 years old and to have sustained a hip fracture necessitating surgical intervention. Exclusion criteria ruled out patients with multiple traumatic injuries, pre-existing chronic infections, or those who had undergone previous hip surgeries.

METHODOLOGY

Data were meticulously gathered from patient medical records. This data included demographic information, medical history, details of the surgical procedure, and post-operative care. The type of surgery performed, whether total hip replacement or internal fixation, was recorded along with any intraoperative complications.Patients were followed for a period of 6 months post-surgery. The primary outcome measures focused on post-operative complications, recovery progress, and rehabilitation outcomes.

1. **Post-operative Complications:** Complications were categorized into several types:
2. **Infection:** Instances of surgical site infection or other infections.
3. **Cardiovascular Issues:** Including arrhythmias, myocardial infarction, and other heart-related problems.
4. **Respiratory Problems:** Including pneumonia, respiratory distress, and other lung-related issues.
5. **Renal Concerns:** Including acute kidney injury and other renal complications.
6. **Neurological Disturbances:** Including delirium, stroke, and other neurological issues.

Gastrointestinal Issues: Including constipation, ileus, and other gastrointestinal tract problems.

Each complication was documented and classified according to its intensity and its impact on the patient’s recuperation process. High-risk patients, identified before surgery, underwent thorough cardiac assessments, enhancement of respiratory capabilities, rigorous observation of kidney function, adjustments in medication, prevention of blood clots, careful

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planning of anesthesia, and attentive post-surgery monitoring.

Secondary Outcome Measures

Functional Recovery: Measured using standardized scales such as the Harris Hip Score and Barthel Index.

Quality of Life: Assessed using the Short Form (SF-36) Health Survey.

Length of Hospital Stay: Duration from admission to discharge.

Readmission Rates: Frequency of readmissions within the 6-month follow-up period.

Statistical Analysis

Statistical analysis was performed using SPSS version 25.0. Continuous data were analyzed as mean ± standard deviation, and categorical data were reported as numbers and percentages. Comparisons between groups (total hip replacement vs. internal fixation) were made using the Chi-square test or Fisher's exact test for categorical variables, and independent t-tests for continuous variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics

The study included 80 elderly patients aged between 65 and 90 years who underwent surgical intervention for hip fractures. The age distribution was as follows: 25% were aged 65-70 years, 31.25% were 71-75 years, 18.75% were 76-80 years, 15% were 81-85 years, and 10% were 86-90 years. The majority of patients were male (56.25%), while females constituted 43.75% of the study population. This distribution indicates a slightly higher prevalence of hip fractures requiring surgical intervention among elderly males compared to females in this cohort.

Table 2: Type of Surgical Procedure

Among the 80 patients, 62.5% underwent total hip replacement, while 37.5% underwent internal fixation. This indicates a preference for total hip replacement in the treatment of hip fractures in elderly patients within this study, likely due to its benefits in terms of stability and recovery outcomes in appropriately selected patients.

Table 3: Intraoperative Complications

During surgery, 75% of the patients experienced no complications. However, 18.75% had minor complications, and 6.25% encountered major complications. These findings suggest that while the majority of surgeries were uneventful, a significant minority did experience complications, underscoring the need for meticulous surgical technique and perioperative management.

Table 4: Post-operative Complications

Post-operative complications were categorized into various types: 6.25% of patients developed infections, 12.5% experienced cardiovascular issues, 10% had respiratory problems, 7.5% had renal concerns, 5% had neurological disturbances, and 3.75% encountered gastrointestinal issues. Notably, 55% of the patients had no complications post-surgery. The cardiovascular issues were the most prevalent complications, indicating a need for enhanced monitoring and management of cardiac health in the perioperative period for elderly patients undergoing hip surgery.

Table 5: Functional Recovery (Harris Hip Score)

Functional recovery was assessed using the Harris Hip Score. The results were as follows: 25% of patients achieved an excellent score (90-100), 43.75% had a good score (80-89), 18.75% had a fair score (70-79), and 12.5% had a poor score (<70). These results show that the majority of patients (68.75%) experienced good to excellent functional recovery post-surgery, reflecting effective surgical and rehabilitative care.

Table 6: Quality of Life (SF-36 Scores)

The quality of life of the patients post-surgery was measured using the SF-36 Health Survey. The mean scores across different domains were: Physical Functioning (65 ± 15), Role Physical (70 ± 20), Bodily Pain (60 ± 25), General Health (75 ± 10), Vitality (70 ± 15), Social Functioning (80 ± 10), Role Emotional (72 ± 18), and Mental Health (78 ± 12). These scores indicate a generally positive impact on the quality of life, particularly in social functioning and mental health, post-surgery.

Table 7: Length of Hospital Stay

The length of hospital stay varied among patients. 37.5% of patients were discharged within 7 days, 50% stayed between 7-14 days, and 12.5% had a prolonged stay of more than 14 days. The majority of patients had a hospital stay of less than two weeks, which is indicative of efficient perioperative care and recovery protocols.

Table 8: Readmission Rates

Within the 6-month follow-up period, 12.5% of the patients were readmitted to the hospital, while 87.5% did not require readmission. The relatively low readmission rate suggests that the initial surgical intervention and subsequent rehabilitation were largely effective, although a small percentage of patients required further medical attention.

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Table 1: Demographic Characteristics

Variable	Frequency (n=80)	Percentage (%)
Age Group (years)		
65-70	20	25.0
71-75	25	31.25
76-80	15	18.75
81-85	12	15.0
86-90	8	10.0
Gender		
Male	45	56.25
Female	35	43.75

Table 2: Type of Surgical Procedure

Type of Surgery	Frequency (n=80)	Percentage (%)
Total Hip Replacement	50	62.5
Internal Fixation	30	37.5

Table 3: Intraoperative Complications

Complication Type	Frequency (n=80)	Percentage (%)
None	60	75.0
Minor	15	18.75
Major	5	6.25

Table 4: Post-operative Complications

Complication Type	Frequency (n=80)	Percentage (%)
Infection	5	6.25
Cardiovascular Issues	10	12.5
Respiratory Problems	8	10.0
Renal Concerns	6	7.5
Neurological Disturbances	4	5.0
Gastrointestinal Issues	3	3.75
No Complications	44	55.0

Table 5: Functional Recovery (Harris Hip Score)

Score Range	Frequency (n=80)	Percentage (%)
Excellent (90-100)	20	25.0
Good (80-89)	35	43.75
Fair (70-79)	15	18.75
Poor (<70)	10	12.5

Table 6: Quality of Life (SF-36 Scores)

Domain	Mean ± SD
Physical Functioning	65 ± 15
Role Physical	70 ± 20
Bodily Pain	60 ± 25
General Health	75 ± 10
Vitality	70 ± 15
Social Functioning	80 ± 10
Role Emotional	72 ± 18
Mental Health	78 ± 12

Table 7: Length of Hospital Stay

Length of Stay (days)	Frequency (n=80)	Percentage (%)
<7	30	37.5
7-14	40	50.0
>14	10	12.5

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Table 8: Readmission Rates

Readmission within 6 months	Frequency (n=80)	Percentage (%)
Yes	10	12.5
No	70	87.5

DISCUSSION

The study's demographic results indicate that elderly males had a slightly higher prevalence of hip fractures requiring surgical intervention compared to females (56.25% vs. 43.75%). This aligns with other studies showing a higher incidence of fractures in elderly males due to factors such as higher activity levels and greater exposure to risk factors. For example, the study by Abrahamsen et al. (2019) highlighted that men are more prone to severe osteoporosis-related fractures due to higher bone turnover and other comorbidities.[9] The age distribution in our study, with the highest frequency in the 71-75 age group, is consistent with findings from the study by Brauer et al. (2009), which reported a peak in hip fracture incidence in the 70-75 age range.[10]The preference for total hip replacement (62.5%) over internal fixation (37.5%) in our study mirrors the trends observed in the research by Gjertsen et al. (2017), which noted that total hip replacements often result in better functional outcomes and lower reoperation rates compared to internal fixation, especially in the elderly population. These benefits include improved mobility, reduced pain, and a lower risk of complications such as non-union or malunion of fractures.[11] Intraoperative complications were relatively low, with 75% of patients experiencing no complications. Minor complications occurred in 18.75% of cases, and major complications in 6.25%. This is in line with the findings of Puvanesarajah et al. (2018), who reported that careful preoperative planning and advanced surgical techniques have significantly reduced the incidence of intraoperative complications in hip fracture surgeries. However, the presence of any complications underscores the importance of meticulous surgical practice and perioperative care.[12] Post-operative complications were observed in 45% of the patients, with cardiovascular issues (12.5%) being the most common. These findings are similar to those reported by Karres et al. (2015), who noted that cardiovascular complications are a leading cause of morbidity in elderly patients post-hip surgery due to their prevalent comorbid conditions.[13] The rate of infections (6.25%) was relatively low, aligning with the study by Metsemakers et al. (2018), which emphasized the importance of stringent aseptic techniques and prophylactic antibiotic use in reducing infection rates.[14] The Harris Hip Score results indicated that 68.75% of patients achieved good to excellent functional recovery. This is comparable to the findings of a study by Lieberman et al. (2018), which showed that early surgical intervention and comprehensive rehabilitation programs significantly enhance functional outcomes in elderly hip fracture patients. The study underscores the effectiveness of early surgical management in improving mobility and reducing the risk of long-term disability.[15] Quality of life, as measured by SF-36 scores, showed positive outcomes in various domains, particularly in social functioning (80 ± 10) and mental health (78 ± 12). These results support the findings of Mariconda et al. (2016), who demonstrated that timely surgical intervention and effective postoperative care can lead to significant improvements in the quality of life for elderly patients with hip fractures. The study highlights the multifaceted benefits of surgical intervention beyond mere physical recovery, extending to psychosocial well-being.[16]Most patients (87.5%) had a hospital stay of less than two weeks, which reflects efficient perioperative care and recovery protocols. This is consistent with the research by Klestil et al. (2018), which found that early mobilization and tailored rehabilitation programs contribute to shorter hospital stays and better recovery outcomes in hip fracture patients.[17] The readmission rate within six months was 12.5%, which is relatively low compared to other studies. For instance, the study by Vestergaard et al. (2016) reported readmission rates of up to 20% in elderly hip fracture patients, often due to complications or comorbid conditions. Our lower readmission rate suggests that effective surgical and postoperative care can significantly reduce the need for readmissions, thereby improving overall patient outcomes.[18]

CONCLUSION

The findings underscore the importance of comprehensive perioperative care to manage complications and enhance recovery outcomes in this vulnerable patient population. The results support the efficacy of total hip replacement and internal fixation surgeries in achieving favorable functional recovery and quality of life in elderly patients.

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