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# MORBIDITY AND MORTALITY FOLLOWING INTERTROCHANTERIC FRACTURES OF FEMUR MANAGED WITH DYNAMIC HIP SCREW (DHS) FIXATION

Orthopaedics

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## ABSTRACT

**Introduction:** Intertrochanteric fracture of the femur is one of the common fractures in the elderly, are a major source of mortality and morbidity impairment in the patients. Dynamic Hip Screw (DHS) fixation is the gold standard for treatment of intertrochanteric femoral fracture. The aim of this study was to evaluate the morbidity and mortality rate of intertrochanteric fracture of the femur managed with dynamic hip screw fixation. **Materials and Methods:** In this study a total of 62 patients with Intertrochanteric femoral fractures were enrolled. In all patientsurgical fixation was performed using a dynamic hip screw (DHS). Mortality rate was calculated. Morbidity rates, being less easy to quantify were studied. **Results:** In this study most common post-operative complication were bed-sore that was present in 14 (22.58 %) patients, followed by chest infection in 9 (14.52 %) patients, wound site infection in 7 (11.29 %), heart failure in 4 (6.45 %) and deep vein thrombosis(DVT) in 3 (4.8%). The results of the current study showed that 11 out of 62 patients died during the follow-up of 1 year, representing an overall mortality rate of 17.74 %. **Conclusion:** Regarding the respective mortality rate of intertrochanteric fracture in this study, as well as its remarkable effect on quality of life, the best strategy appears to be the care, prevention of fractures and provision of rehabilitation services as well as correct follow-up of the patients in the next steps.

## KEYWORDS

Hip, Intertrochanteric femoral fracture, Management, DHS fixation, Morbidity, Mortality

## INTRODUCTION

Intertrochanteric fracture of the femur is one of the common fractures in the elderly, represents a major public health problem. Femoral intertrochanteric fractures have been estimated to occur in more than 2,000,000 patients each year in the United States [1, 2]. The cost of treating these fractures is estimated to be US $16 billion per year [2].

Intertrochanteric femoral fractures significantly contribute to health deterioration and long-term morbidity and mortality. The arduous rehabilitation, functional decline, and reduced quality of life affect patients' independence and livelihood [3, 4]. Additionally, Intertrochanteric femoral fractures are associated with a significant mortality risk during a hospital stay and following discharge. The reported mortality rate of Intertrochanteric femoral fractures in the literature ranges from 11% to more than 30% [5].

Due to problems caused by these fractures and an increase in the number of the elderly population leading to a significant increase in the incidence of these fractures, it is absolutely necessary to use an effective and appropriate treatment modality for such patients. In line with the improvements in the prevention and medical care of these fractures, orthopedic treatment has also undergone a dramatic shift in the past decades [6]. As our understanding of the biomechanics of these fractures has evolved, implants have been redesigned to ultimately improve the standards of care [7]. The appropriate implant selection is based on the access to the device, fracture characteristics, the patient's bone quality and underlying medical conditions, and the surgeon's preferences [7].

Many treatment methods have been used for the reduction of intertrochanteric fractures, including dynamic hip screw (DHS), proximal femoral nail (PFN), unipolar and bipolar hemi-arthroplasty and external fixation. Early mobilization and prompt return to pre-fracture activity levels are the main goals of surgery. The treatment of this fracture remains a challenge to the surgeon. Closed methods of treating intertrochanteric fractures have been abandoned. Rigid fixation with early mobilization of patients should be considered as the standard treatment [8-10]. Although many devices can achieve rigid fixation, the dynamic hip screw (DHS) is the most commonly used device for intertrochanteric fractures.

The aim of this study was to evaluate the incidence of morbidity and mortality in patients with intertrochanteric femoral fracture managed with DHS fixation.

## MATERIALS AND METHODS

This prospective observational study was conducted in Govt. Bone and Joints Hospital, Barzulla, an associated Hospital for Govt. Medical College, Srinagar. In this study a total of 62 patients with intertrochanteric femoral fractures were enrolled from April 2022 to August 2023. In all patients surgical fixation was performed using a dynamic hip screw (DHS). All patients were informed about the study in all respects and informed written consent was obtained. The patients were evaluated and analyzed preoperatively and underwent operation.

### Inclusion Criteria

1. Age ≥55 years
2. Patients fit for surgery
3. Patients willing to participate
4. Patients ambulatory prior to fracture

### Exclusion Criteria

1. Age <55 years
2. Pathological fractures
3. Multiple fractures
4. Subtrochanteric extension of the fracture trace

Patients were assessed both clinically and radiologically during follow up which was done at 1 month, 3 months, 6 months and 1 year. Mortality rate was calculated. Morbidity rates, being less easy to quantify were studied.

## RESULTS

The mean age of the study population was 72.6 (range 56-89) years. There were 23 (37.10 %) males and 39 (62.90 %) females in this study. The common mechanism of injury was fall in 48 (77.42 %) patients followed by road traffic accidents in 14 (22.58 %) patients (Table 1).

Table 1: Demographic characters of study population (N=62)

| Demographic characters | | No. of patients | Percentage |
|---|---|---|---|
| Sex | Male | 23 | 37.10 |
| | Female | 39 | 62.90 |
| Age group | 55-65 Years | 12 | 19.36 |
| | 66-75 Years | 28 | 45.16 |
| | >75 Years | 22 | 35.48 |

| | | | |
|---|---|---|---|
| Mechanism of injury | Road traffic accidents | 14 | 22.58 |
| | Fall | 48 | 77.42 |
| Side | Right | 33 | 65.22 |
| | Left | 29 | 34.78 |
| OTA fracture type | I | 35 | 56.46 |
| | II | 27 | 43.54 |

In this study most common post-operative complication were bed-sore that was present in 14 (22.58 %) patients in whom 3 (21.43 %) patients had deep bedsore and 11 (78.57 %) patients had superficial bedsore. Other complications were deep vein thrombosis (DVT) in 3 (4.8 %), wound site infection in 7 (11.29 %), heart failure in 4 (6.45 %) and chest infection in 9 (14.52 %) patients.

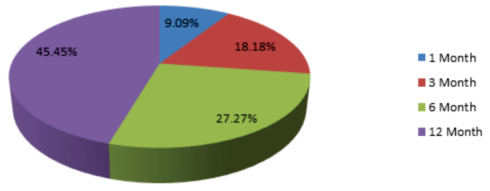
Pattern of morbidity characteristics in decreasing order of frequency are stated in tabulated form as follows:

| | | |
|---|---|---|
| Bed sore: | 14 | 22.58% |
| Superficial bedsore | 11 | (78.57%) |
| Deep bedsore | 03 | (21.43%) |
| Chest infection | 09 | 14.52% |
| Wound site infection | 07 | 11.29% |
| Heart failure | 04 | 6.45% |
| Deep vein thrombosis | 03 | 4.8% |

The results of the current study showed that 11 out of 62 patients died during the follow-up of 1 year, representing an overall mortality rate of 17.74 %. The mortality rate was 7 (63.64%) in the age group of >75 years age, 3 (27.27 %) in the age group of 66-75 years and 1 (9.09 %) in the age group of 55-65 years.

In this study mortality rate at 1 month, 3 months, 6 months and 12 months follow-ups were 9.09 %, 18.18 %, 27.27 % and 45.45% respectively (figure 1). Most common cause for deaths was cardiac event in 4 (36.36%) patients and chest infection in 3 (27.27 %) patients.

**Figure 1: Mortality rate at 1, 3, 6 and 12 months follow-up**




## DISCUSSION

As the global life expectancy rises and the populations are aging, the incidence of fragility fractures, particularly hip fractures, is increasing worldwide. While preventive measures are being implemented, the evidence clearly shows that hip fractures are a global health challenge. Intertrochanteric fractures of femur are common injury in elderly population usually arising from trivial falls which lead to the most severe health problems and reduced quality of life.

Until operative treatment involving the use of various implants was introduced in the 1950s, these fractures were managed using conservative methods based on traction and bed rest resulting in very high mortality. The primary goal of treatment with surgery is early mobilization to avoid secondary complications which can result in high mortality. Early operations on patients with intertrochanteric fractures improved the ability to return to independent living and complications of prolonged immobilization are prevented. For a femoral intertrochanteric fracture, many devices can achieve rigid fixation. In this study we managed these fractures with dynamic hip screw (DHS), the most commonly used device for intertrochanteric fractures [11-13]. The aim of this study was to evaluate the incidence of morbidity and mortality in patients with intertrochanteric femoral fracture managed with DHS fixation.

The mean age of the study population was 72.6 (range 56-89) years, comparable to Eckriffner et al with mean age 75.1 years. However, the intertrochanteric femoral fractures are reportedly more prevalent among females in most investigations. In this study, the majority of patients 39 (62.90 %) were females near about equivalent to the study of Hindmarsh et al. [14], in which 74.93% of patients were females. It is well-established that women have a higher risk of hip fractures, with a female to male ratio of 1.7 to 2.5 in the literature [15, 16]. Interestingly, studies from the Middle East region have reported a much closer incidence between males and females, ranging from 0.9 to 1.4 [17, 18], which has been replicated in previous studies from Iran, at 1.1 [19, 20].

After a femoral fracture, elderly subjects are liable to decompensate their risky preexisting pathological state. The associated complications most frequently encountered are broncho-pulmonary, thromboembolic, infectious, cardiac, urinary tract infection, bed sores,DVT and stroke [21]. In the current series such complications affected 54.84 % of cases, in agreement with the various reports in the literature [22, 23]. The increase in number of co morbidities is found to be a major risk factor for death in this study and is statistically significant. As the number of co morbidities increase, the percentage of deaths also increases. In our study most common cause for deaths was cardiac event in 4 (36.36%) patients and chest infection in 3 (27.27 %) patients.

The mortality rate associated with hip fractures is an important aspect to consider. Studies have indicated that there is a mortality rate of 7.1% directly related to the fracture itself. This means that a notable number of individuals who experience a hip fracture also face an increased risk of death as a result. It is crucial to address this issue and implement effective strategies to improve outcomes and reduce mortality rates. Therefore, it is crucial to implement prevention strategies promptly. Fortunately, there are now well-validated methods available for detecting the risk of femoral fractures, including clinical risk-factor assessment and various imaging and biochemical assessments such as CT scans, DEXA, US, and bone fragility analysis. These methods can aid in the early identification and prevention of these fractures.

The results of the current study showed that 11 out of 62 patients died during the follow-up of 1 year, representing an overall mortality rate of 17.74 %, comparable results to a study conducted by Scott Schnell, the mortality rate a year after fracture was reported 21.2% [24].

Interestingly, older studies have reported higher mortality rates of about 21–39% [25, 26], while more recent studies have reported a mortality rate of about 2.5–14.6% [27, 28], which suggests a trend of decreasing mortality with improved care. Age was determined to be a risk factor for mortality and morbidity in our study. The mortality rate was (63.64%) in the age group of >75 years age, (27.27 %) in the age group of 66-75 years and (9.09 %) in the age group of 55-65 years. There is an increased Mortality in patients aged more than 80 years compared with the younger age group and this relation was found to be statistically significant.

In this study mortality rate at 1 month, 3 months, 6 months and 12 months follow-ups were 9.09 %, 18.18 %, 27.27 % and 45.45 respectively, which is comparable to other studies [29-32].

The 1-month mortality has been reported about 3–14% in the literature. The large mortality range is partly explained by the baseline patient and injury characteristics. Regardless, we found a 1-month mortality rate of 9.09 %, which is in line with the literature.

## CONCLUSION

There are several risk factors of mortality, including age ≥ 75 years. At 1 year follow-up of the patients, it can be concluded that mortality rate was comparable with other reports. Regarding the respective mortality rate of intertrochanteric fracture in this study, as well as its remarkable effect on quality of life, the best strategy appears to be the care, prevention of fractures and provision of rehabilitation services as well as correct follow-up of the patients in the next steps.

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