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Original Research Article

Demographic and clinical profiles of patients with intertrochanteric hip fractures in Jordan

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ABSTRACT

Background: Intertrochanteric hip fractures are a common injury in elderly patients and are associated with significant morbidity and healthcare burden. Understanding patient characteristics and fracture patterns is important for improving management strategies.
Methods: This retrospective descriptive study was conducted at Jordan University Hospital and included 80 patients with intertrochanteric hip fractures managed between January and December 2023. Data were collected from medical records. Variables included demographic characteristics, comorbidities, fracture patterns, and treatment methods. Data were analyzed using descriptive statistics.
Results: The mean age was 74.8±12.3 years. Patients aged ≥70 years represented 70.0% of the cohort. Female patients accounted for 56.3%. Low-energy falls were the cause of injury in 96.3% of cases. Simple fracture pattern was observed in 60.0% of patients. Hypertension (52.5%) and diabetes mellitus (35.0%) were the most common comorbidities. All patients were managed surgically. Proximal femoral nail was used in 62.5% of cases, while dynamic hip screw was used in 37.5%. Surgery within 48 hours was performed in 67.5% of patients. The mean hospital stay was 6.8±2.4 days.
Conclusions: Intertrochanteric hip fractures in this cohort mainly affected elderly patients with multiple comorbidities and were predominantly caused by low-energy falls. Most fractures were simple, and surgical fixation was performed in all patients, with proximal femoral nail being the most commonly used method.

Keywords: Intertrochanteric fracture, Hip fracture, Elderly, Comorbidities, Proximal femoral nail, Dynamic hip screw, Jordan

INTRODUCTION

Hip fractures are a common and serious orthopedic injury.[1] They occur mainly in elderly patients.[2] These fractures are associated with high morbidity and mortality.[3] Many patients experience reduced mobility after the injury. Some patients lose their ability to live independently.[4] Hip fractures also place a significant burden on healthcare systems.[5] Patients often require hospitalization, surgery, and rehabilitation. The number of hip fractures has increased worldwide. This increase is related to population aging and the rising prevalence of osteoporosis.[6] Intertrochanteric hip fractures are a common type of proximal femoral fracture. They occur in the region between the greater and lesser trochanters of the femur.[7] Most intertrochanteric fractures occur in elderly patients after low-energy falls.[8] Poor bone quality and osteoporosis increase the risk of these fractures. In younger patients,

these fractures usually result from high-energy trauma such as road traffic accidents or falls from height. Age, osteoporosis, and reduced mobility are important risk factors.[9,10]

Patients with intertrochanteric hip fractures often have multiple medical conditions. Common comorbidities include diabetes mellitus, hypertension, ischemic heart disease, and cerebrovascular disease.[11] These conditions may affect treatment decisions and perioperative management. Patients with several comorbidities may have a higher risk of complications during hospitalization. Therefore, understanding the medical profiles of these patients is important for improving patient care.[12,13] Fracture characteristics vary among patients. Some fractures are simple and relatively stable.[14] Other fractures are comminuted or unstable.[15] Certain fracture features affect stability and treatment planning. These features include reverse oblique patterns, calcar involvement, subtrochanteric extension, and a thin lateral wall.[16,17] Careful assessment of fracture characteristics is important before selecting the treatment method.

Surgical fixation is the main treatment for most intertrochanteric hip fractures. Early surgery allows early mobilization and helps reduce complications related to prolonged immobilization.[18,19] Common fixation methods include dynamic hip screws and proximal femoral nails. The choice of treatment depends on fracture characteristics, bone quality, and the patient's general condition.[20,21] This study aimed to describe the demographic characteristics, medical profiles, fracture patterns, and treatment approaches of patients presenting with intertrochanteric hip fractures in Jordan. Understanding these characteristics may help provide a clearer picture of the patient population affected by this injury and support better clinical management.

METHODS

Study design and setting

This was a retrospective descriptive study conducted at Jordan University Hospital. The study focused on patients diagnosed with intertrochanteric hip fractures. These patients were managed at the hospital over the study period Jan to Dec 2023. A total of 80 patients were included in the analysis. The hospital is a tertiary referral center that receives a wide range of trauma cases from different regions.

Study population

The study included adult patients who presented with intertrochanteric hip fractures. All patients were diagnosed based on clinical assessment and radiographic findings. Only patients with a confirmed diagnosis were included. Patients with incomplete medical records or missing key variables were excluded. All included patients had sufficient data for analysis.

Data collection

Data were collected from hospital medical records. The data were reviewed carefully and recorded in a structured format. Demographic data included age and sex. Clinical data included the presence of medical comorbidities. These comorbidities included diabetes mellitus, hypertension, ischemic heart disease, cerebrovascular disease, and osteoporosis. These conditions were recorded based on documented medical history.

Fracture-related characteristics were also collected. These included the side of the fracture (right or left). Fracture pattern was recorded based on radiographic images. Additional features were documented. These included comminution, reverse oblique pattern, calcar involvement, subtrochanteric extension, thin lateral wall, and pathological fractures. These variables were selected because they may affect fracture stability and treatment planning.

Treatment modalities

Treatment methods were documented for all patients. Surgical treatment was the only approach in all cases. The commonly used fixation methods included proximal femoral nail (PFN) and dynamic hip screw (DHS). The choice of treatment depended on fracture characteristics, patient medical status, and surgeon preference. All treatment decisions were made by the treating orthopedic team.

Statistical analysis

Data were entered into the Statistical Package for the Social Sciences (SPSS) version 26 for analysis. Continuous variables were presented as mean and standard deviation. Categorical variables were presented as frequencies and percentages. The results were summarized using descriptive statistics. No advanced statistical tests were performed, as the study aimed to provide a descriptive overview of the patient population.

Ethical considerations

Ethical approval for the study was obtained from the institutional review board of Jordan University Hospital. The study was conducted in accordance with ethical standards. Patient confidentiality was maintained throughout the study. No personal identifiers were included in the data collection or analysis. Data were used only for research purposes.

RESULTS

A total of 80 patients with intertrochanteric hip fractures were included. The mean age was 74.8±12.3 years (range 45–96). Patients aged ≥70 years represented 56 (70.0%) of the cohort. Female patients were 45 (56.3%), while male patients were 35 (43.7%). Low-energy falls accounted for

77 (96.3%) of cases, while high-energy trauma was reported in 3 (3.7%) patients (Table 1).

Table 1: Demographic characteristics and mechanism of injury (n=80).

Variables	Value
Number of patients	80
Mean age (years)	74.8±12.3
Age range	45–96
Age groups	
<60 years	10 (12.5%)
60–69 years	14 (17.5%)
70–79 years	28 (35.0%)
≥80 years	28 (35.0%)
Sex	
Male	35 (43.7%)
Female	45 (56.3%)
Mechanism of injury	
Low-energy fall	77 (96.3%)
High-energy trauma	3 (3.7%)

Regarding fracture characteristics, 46 patients (57.5%) had right-sided fractures and 34 (42.5%) had left-sided fractures. Simple fracture pattern was observed in 48 patients (60.0%), while reverse oblique pattern was present in 6 patients (7.5%).

Comminution was identified in 20 patients (25.0%). Calcar involvement was present in 8 patients (10.0%). Subtrochanteric extension was observed in 10 patients (12.5%). Thin lateral wall was documented in 15 patients (18.8%). Pathological fractures were identified in 2 patients (2.5%) (Table 2).

Table 2: Fracture characteristics.

Variables	N (%)
Fracture side	
Right	46 (57.5)
Left	34 (42.5)
Fracture pattern	
Simple	48 (60.0)
Reverse oblique	6 (7.5)
Fracture stability features	
Comminution	20 (25.0)
Calcar involvement	8 (10.0)
Subtrochanteric extension	10 (12.5)
Thin lateral wall	15 (18.8)
Pathological fracture	2 (2.5)

A total of 68 patients (85.0%) had at least one comorbidity, while 49 patients (61.3%) had two or more comorbidities. Hypertension was present in 42 patients (52.5%). Diabetes mellitus was present in 28 patients (35.0%). Ischemic heart disease was observed in 16 patients (20.0%). Cerebrovascular disease was present in 10 patients (12.5%). Osteoporosis was documented in 12 patients (15.0%). ASA classification showed 6 patients (7.5%) as ASA I, 28 (35.0%) as ASA II, 34 (42.5%) as ASA III, and 12 (15.0%) as ASA IV.

Table 3: Clinical and medical profiles.

Variables	N (%)
Comorbidities	
Hypertension	42 (52.5)
Diabetes mellitus	28 (35.0)
Ischemic heart disease	16 (20.0)
Cerebrovascular disease	10 (12.5)
Osteoporosis	12 (15.0)
≥1 comorbidity	68 (85.0)
≥2 comorbidities	49 (61.3)
ASA classification	
ASA I	6 (7.5)
ASA II	28 (35.0)
ASA III	34 (42.5)
ASA IV	12 (15.)
Pre-injury mobility	
Independent	52 (65.0)
Walking aid	20 (25.0)
Dependent	8 (10.0)

Table 4: Treatment and perioperative outcomes.

Variables	N (%)
Fixation method	
Proximal femoral nail (PFN)	75 (93.7)
Dynamic hip screw (DHS)	5 (6.3)
Timing of surgery	
<48 h	54 (67.5)
≥48 h	26 (32.5)
Hospital stays	
Mean length of stay (days)	6.8±2.4
Blood transfusion	
Yes	22 (27.5)
No	58 (72.5)
In-hospital complications	
Yes	10 (12.5)
No	70 (87.5)

Pre-injury mobility was independent in 52 patients (65.0%), required walking aid in 20 patients (25.0%), and dependent in 8 patients (10.0%) (Table 3).

All patients underwent surgical management. Proximal femoral nail was used in 75 patients (93.7%), while dynamic hip screw was used in 5 patients (6.3%).

Surgery within 48 hours was performed in 54 patients (67.5%), while 26 patients (32.5%) underwent surgery after 48 hours. The mean hospital stay was 6.8±2.4 days. Blood transfusion was required in 22 patients (27.5%). In-hospital complications were observed in 10 patients (12.5%) (Table 4).

DISCUSSION

This study described the demographic characteristics, medical profiles, fracture patterns, and management of patients with intertrochanteric hip fractures in Jordan. The study included 80 patients. Most patients were elderly, with a mean age of 74.8 years. Female patients were more common than male patients. These findings are consistent with the known epidemiology of hip fractures, where advanced age and female sex are important risk factors. Osteoporosis and reduced bone density in elderly patients, especially women, contribute to this pattern.

Low-energy falls were the main mechanism of injury in this cohort. More than 95% of fractures resulted from simple ground-level falls. High-energy trauma was rare. This reflects the typical pattern of fragility fractures in elderly populations. Similar findings have been reported in previous studies, where most intertrochanteric fractures occur after minor trauma in patients with poor bone quality.[22,23] This emphasizes the importance of fall prevention strategies and osteoporosis management in this population.

Regarding fracture characteristics, most fractures were classified as simple. However, a notable proportion showed features of instability. Comminution, subtrochanteric extension, calcar involvement, and thin lateral wall were observed in a considerable number of patients. These features are important because they affect fracture stability and influence the choice of fixation method.[24,25] The presence of unstable features in a significant proportion of patients highlights the complexity of managing intertrochanteric fractures in clinical practice.

Most patients in this study had one or more medical comorbidities. Hypertension and diabetes mellitus were the most common conditions. A large proportion of patients had multiple comorbidities. These findings are expected in elderly populations. The presence of multiple medical conditions can increase perioperative risk and complicate management. It also requires careful preoperative assessment and multidisciplinary care.

All patients in this study were managed surgically. Proximal femoral nail was the most commonly used fixation method. Dynamic hip screw was used in a smaller proportion of patients. PFN was more frequently used in fractures with unstable features, while DHS was used in stable fractures. This reflects current clinical practice.[26] Many surgeons prefer intramedullary fixation for unstable fractures due to better biomechanical stability.[27] DHS remains a suitable option for stable fracture patterns.

Most patients underwent surgery within 48 hours. Early surgery is recommended in hip fracture management.[28] It is associated with reduced complications and improved outcomes.[29,30] A smaller proportion of patients had delayed surgery. This delay may be related to medical optimization or logistical factors. The findings of this study are consistent with previously published literature. Several studies have reported that intertrochanteric fractures mainly affect elderly patients with multiple comorbidities.[31] Low-energy falls are the most common cause.[7] Hypertension and diabetes are frequently reported comorbidities.[32] Surgical fixation is the standard treatment, with increasing use of intramedullary devices in unstable fractures.[33] The current study supports these observations in a Jordanian population.

This study has several strengths. First, it provides a clear description of patient characteristics, fracture patterns, and treatment approaches in a real-world clinical setting. Second, all patients were managed at a single tertiary center, which ensures consistency in diagnosis and treatment. Third, the study included multiple clinically relevant variables, including comorbidities, fracture features, and perioperative parameters. These factors provide a comprehensive overview of the patient population.

However, this study also has limitations. The study design was retrospective, which may introduce selection bias and limit data accuracy. The sample size was relatively small, and the study was conducted at a single center. This may limit the generalizability of the findings. Despite these limitations, this study provides useful baseline data on intertrochanteric hip fractures in Jordan.

CONCLUSION

Intertrochanteric hip fractures in this cohort mainly affected elderly patients with a high burden of medical comorbidities. Most fractures resulted from low-energy falls and were simple in pattern, although a notable proportion showed unstable features. Surgical fixation was performed in all patients, with proximal femoral nail being the most commonly used method. These findings provide a clear overview of patient characteristics, fracture patterns, and current management practices, and may support improved clinical planning and patient care.

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