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## Risk factor for intertrochanteric fracture and their functional outcome: A retrospective study

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### Abstract

**Aim and objectives:** To identify baseline factors relevant risk factors for intertrochanteric fractures and to assess the functional outcome in follow up.

**Method:** A retrospective study was conducted among 95 patients admitted in our institution (a tertiary medical care) over a period of 1 year between 2019-2020. Various aspects have been compared. The predictors used were the calcaneal bone mineral density, age, gender and assessing functional outcome based on surgery type i.e. Dynamic hip screw, nailing, or replacement surgeries. In multivariate hazards models, several risk factors increased the risk of intertrochanteric fracture. Other factors also played a major role in occurrence of intertrochanteric fracture in various populations' Steroid use and impaired functional status and Poor health status being some of them. Data were analyzed with t-test, Pearson's correlations, and multivariate regression.

**Result:** A total of 97 patients were selected of which 95 patients completed the study with an average follow up time of 6 months. 2 patients died in the course of follow up and the rest 68 were eligible for analysis with Harris his score (HHS) and Euro 5 dimension were taken at final follow up and came into the following conclusions.

**Conclusion:** We could identify several baseline factors associated with intertrochanteric fractures in the given population which helped us in treatment and functional outcome, and also if extrapolated to the general population could help in avoiding the occurrence of intertrochanteric fractures in various strata of general population.

**Keywords:** Risk factors, intertrochanteric fractures

### Introduction

Hip fractures especially intertrochanteric fractures because significant disability for many older adults, with some of the worst outcomes for those aged 65 years or older [1]. Having an intertrochanteric fracture in later life can lead to long recovery periods, a decreased quality of life, higher mortality rates and increased likelihood of entry into aged lifestyle compared to those without a hip fracture. There have been many studies conducted identifying intertrochanteric fracture risk in older adults. These include a different variety of cohorts including those recently admitted to hospital. Risk factors identified by Stolee *et al.* for a home care population were older age, females, osteoporosis, falls, substance use, malnutrition and cognitive impairment [7]. Other studies identifying intertrochanteric fracture risk for older people in found factors such as differing ethnic backgrounds, bone mineral density (BMD), previous hip fractures, reduced physical activity, chronic co-morbid conditions, and medications to be significant. High rate of intertrochanteric fracture amongst older people has two main reason: bone mass with decreased mineral density and increased risk of fall-related trauma. This study is meant to point out various avoidable and unavoidable risk factors related to intertrochanteric femur fractures and their functional outcome in the given population.

### Inclusion and exclusion criteria

#### Inclusion

1. Patients with closed intertrochanteric fracture who has undergone various surgical management.

- Patients who have consented after explaining the nature and course of the study.

**Exclusion**

- Patients who were lost on follow up.
- Intertrochanteric fractures associated with pathologic fractures.
- Associated polytrauma.
- Fractures which has been conservatively managed due to various causes.
- Died in the course of study.

**Methods**

Ethics statement: - Written informed consent was obtained from every participant who were undergoing the study and the investigations / clinical examinations were conducted according to declaration of Helsinki. (Copy of consent has been attached herewith)

**Outcome measures**

- Harris Hip Score-A 13 domained clinican administered tool for outcome of hip fuctional status in 4 areas mainly ie pain, function, range of movements and activity. Score ranges from 0-100 with higher score indicating better prognosis.
- Euro5 Dimension-also known as EQ5D index which comprises of 5 dimensions as name indicates, i.e. Self-care, mobility, usual activities, discomfort and anxiety. It represents health utility and with decreasing scores represents worsr health utility.

**Statistical analysis**

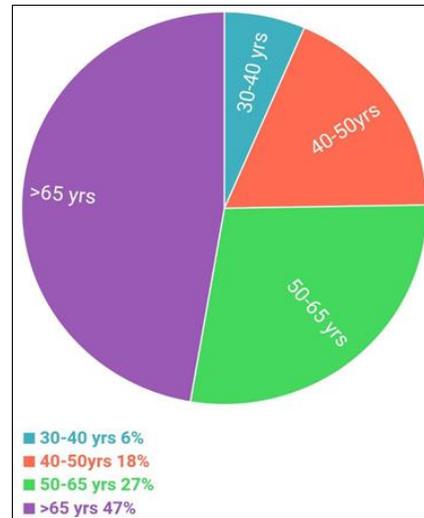
Descriptive statistical analysis was used to summarize all factors. All variables were tabulated and mean median and standard deviation were calculated. Pearson chi square test were used for categorical variables, and t test for continuous variables. Multivariate regression analysis with 95% confidence interval were used to evaluate factors influencing hip function. All analysis was carried using SPSS software.

**Result**

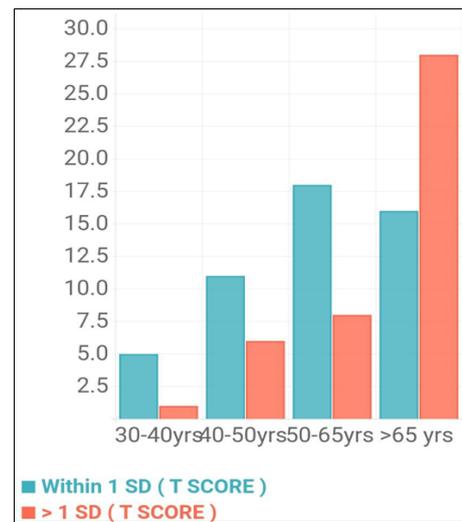
We report a mean age of 63 years for the incidence of intertrochanteric fracture, with females more prone to the incidence in 1.21: 1 ratio  
 The causes attributed being multifactorial. The mean BMI in patient developing intertrochanteric fracture was 29.2 and above. Incidence of developing intertrochanteric fracture in BMD 1 SD: > 1 SD = 0.32:1.

**Table 1:** Demographic information and clinical factors

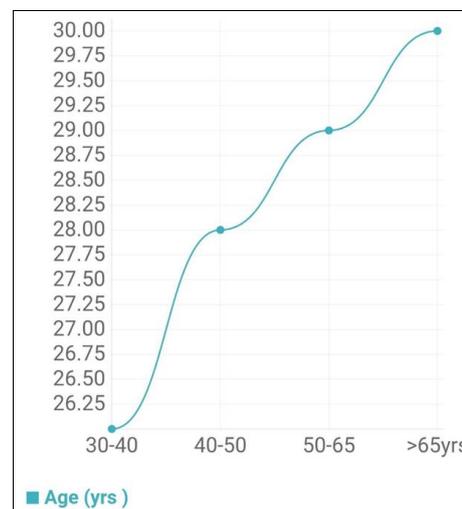
S. No.	Age(YRS)	Male	Female	BMD(T-score)		AVG. BMI (KG/CM <sup>2</sup> )
				Within 1 SD	>1 SD	
				1.	30-40	
2.	40-50	7	10	6	11	27.9
3.	50-65	12	14	8	18	29.6
4.	>65	21	23	16	28	30.2



**Fig 1:** Incidence of intertrochanteric fractures in different age group



**Fig 2:** Agewise BMD comparison



**Fig 3:** Avg BMI vs. Age group in fracture occurrence

**Table 2:** Clinical outcomes in different treatment groups (mean +/- SD)

Clinical outcomes in different treatment groups (Mean +/- SD)			
S. No	Group	HHS	Eq5d
1.	Bipolar Hemiarthroplasty	68.8 +/-12.6	0.69+/-0.19
2.	Nailing	78.3+/-10.4	0.78+/-0.84
3.	DHS	73.6+/-6.4	0.76+/-0.62

DHS - dynamic hip screw

HHS- harris hip score

Eq5d - euro5 dimension

### Discussion

An intertrochanteric fracture is a type of hip fracture where the fracture line extends between the trochanters of femur, ie the lesser trochanter and greater trochanter," which are bony protrusions on the proximal femur. There are two trochanters in proximal femur: the greater trochanter and the lesser trochanter. An intertrochanteric fracture occurs between the greater and lesser trochanters of proximal femur. Intertrochanteric fractures are one the most common hip fractures. About 50 percent of all hip fractures caused following trauma are intertrochanteric fractures. Common symptoms include: 1. severe pain 2. Impaired weight bearing 3. Restricted movements 4. Bruising and swelling around the hip

### Causes

The common causes of intertrochanteric fractures include falls or trauma. These problems are more among older people, who are at a higher risk of falling. In some cases, people with osteoporosis bone can get a fracture from trivial trauma. Car crashes and other road traffic accidents can also cause hip fractures.

### The risk factors for intertrochanteric fractures include

1. Female sex
2. Age more than 60
3. History of falls
4. Osteoporosis
5. Having low bone density and low muscle mass
6. Having problems with walking or balance

### Diagnosis

1. physical exam and medical history
2. X-rays
3. Computer tomography
4. bone scans

Usually, X-rays provide ample information to diagnose a hip fracture. However, small hairline fractures early stress fractures may not show up on X-rays, so other imaging tests may be necessary.

### Treatment options

The intertrochanteric fractures is almost always managed surgically except for those with contraindication for surgery such as severe head injury, uncontrolled co morbidities or contraindication for anesthesia etc. One of the most common surgical treatments for this type of hip fracture is an open reduction and internal fixation (ORIF) with screws, rods, pins, or plates. Increase in crude hip fracture incidence rates during the 20th century have been observed in many developed countries. Much of the increase in crude incidence rates can be attributed to simple population aging, but there is also evidence from several studies of an increase in the age-specific incidence rate of hip fracture. There is a convincing evidence of secular

increases in hip fracture risk among men in south East Asia. Trends over time in various subtle variables diet, cigarette smoking, and alcohol use have been proposed to explain the observed secular trends. Another hypothesized factor is an increasing sedentary life-style in advanced industrial societies, especially among men.

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