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Clinical profile of patients with acute fracture neck of femur

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Abstract
Femoral neck fractures and pertrochanteric fractures are of approximately equal incidence and together make up over 90% of the proximal femur fractures and the remaining 5–10% is subtrochanteric. The femoral neck fractures are only 2% in patients with age under 50 years. After 50 years, the incidence is doubled for each subsequent decade and it is 2 to 3 times higher in women than in men. The overall annual age-standardized rates of femoral neck fractures are higher among white women than among black women. A prospective study was conducted on patients with acute fracture neck of femur aged above 60 years treated with THA in the Department of Orthopedics. Clearance from the institutional ethics committee was obtained before the study was started. An informed, written and bilingual consent was obtained before the study was started. About 40% of study subjects presented to the hospital at 2 – 5 days, 35% presented on 1st day, 17.5% presented on 6 – 10 days and 7.5% presented after 10 days of fracture.

Keywords: Femoral neck fractures, pertrochanteric fractures, THA

Introduction
Fractures of the femoral neck are the intracapsular injuries that usually affect the older patients with osteoporosis after insignificant trauma and it is a common event. The increased number of fractures of the femoral neck is essentially due to the demographic progress with increasing life expectancy in industrial countries [1].

The incidence of femoral neck fractures is increasing continuously among the aging population on the planet. The number of hip fractures is expected to increase from 1.7 million in 1990 to 6.3 million in 2050. Femoral neck fractures and pertrochanteric fractures are of approximately equal incidence and together make up over 90% of the proximal femur fractures and the remaining 5–10% is subtrochanteric. The femoral neck fractures are only 2% in patients with age under 50 years. After 50 years, the incidence is doubled for each subsequent decade and it is 2 to 3 times higher in women than in men. The overall annual age-standardized rates of femoral neck fractures are higher among white women than among black women. There is wide variation in the incidence of femoral neck fractures worldwide, with the highest incidence in industrialized countries, compared with developing countries. Among the population of Asia, lower incidence rates of femoral neck fractures are registered. Institutionalized geriatric patients and impaired cognitive status patients are at higher risk of femoral neck fracture [2, 3] When there is a side fall and direct impact on the trochanter, the mechanism of femoral neck fracture involves bending of the neck under the body weight. The strength of the bone at bending and torsion depends on its section modulus which depends on bone diameter. The bending moment breaking the femoral neck is a product of the femoral neck axis length and the bending component of the body weight. The bending component of body weight is perpendicular to the femoral neck axis and gets bigger as the femoral neck shaft angle gets larger [4]. The larger the femoral neck shaft angle is, and the longer the femoral neck axis length is, the greater the bending moment acting on the femoral neck is, thus increasing the risk of fracture. The Femoral Neck Axis Length (FNAL) and the Femoral Neck Width (FNW) are correlated. A femoral neck fracture can occur in individuals with long femoral neck although at the same time their neck is wide.

Methodology

A prospective study was conducted on patients with acute fracture neck of femur aged above 60 years treated with THA in the Department of Orthopedics. Clearance from the institutional ethics committee was obtained before the study was started. An informed, written and bilingual consent was obtained before the study was started.

A total 40 patients with acute fracture of neck of femur aged above 60 years treated with THA attending the Department of Orthopedics, constituted the sample size. The sample size was calculated by assuming a Harris hip score of 81 points with a standard deviation of 5, with a relative precision of 2% (Alpha of 5%, 95% confidence interval). The inclusion and exclusion criteria were as follows

Inclusion criteria

1. Age group: 60years and above.
2. Cases include both males and females
3. Prospective study between January 2016 –June 2017
4. Acute fracture (less than 3weeks) neck of femur
5. Minimum follow up 6 months
6. Displaced intracapsular femoral neck fracture(gardens classification 3 and 4)
7. Active elderly
8. Mentally sound

Exclusion criteria

1. Age below 60 years
2. neglected femoral neck fractures in elderly(more than 3weeks)
3. Bedridden/non ambulatory patients.
4. Institutionalized patients
5. Cognitively impaired patients
6. Post-operatively infected patients
7. Patients with Post-operative hip dislocation

Patients with acute fracture neck of femur treated with total hip arthroplasty aged above 60 yrs who satisfied the inclusion criteria were included in the study. They were admitted and examined according to protocol both clinically and radiologically. Trained joint replacement surgeons in the hospital provided the treatment. The patients were evaluated clinically and radiologically before surgery and at 6 weeks, 12 weeks, and 24 weeks. Each case were followed minimally for 6 months. Functional outcome is assessed by Harris hip scores where the score range from 70-100 and the interpretations are as follows. Less than 70 is poor, 70- 79 is fair, 80-89 is good and 90-100 is excellent.

Results

Table 1: Distribution of the study group according to age group

Age group	Frequency	Percent
60 – 62 years	4	10.0
63 – 64 years	9	22.5
65 – 66 years	8	20.0
67 – 68 years	5	12.5
69 – 70 years	9	22.5
More than 70 years	5	12.5
Total	40	100.0

Table and chart no 1 shows that, about 22.5% of the patients belonged to 63 – 64 years and 69 - 70 years. About 20% of the patients belonged to 65 – 66 years, 12.5% belonged to 67 – 68 years and 10% belonged to 60 – 62 years.

Table 2: Distribution of the study group according to sex

Sex	Frequency	Percent
Male	17	42.5
Female	23	57.5
Total	40	100.0

The sexwise distribution had shown that, 42.5% were males and 57.5% belonged to females.

Table 3: Distribution of the study group according to side of fracture

Side of fracture	Frequency	Percent
Left	19	47.5
Right	21	52.5
Total	40	100.0

Table 4: Distribution of the study group according to time of presentation

Time of presentation	Frequency	Percent
1st day	14	35.0
2 – 5 days	16	40.0
6 – 10 days	7	17.5
More than 10 days	3	7.5
Total	40	100.0

About 40% of study subjects presented to the hospital at 2 – 5 days, 35% presented on 1st day, 17.5% presented on 6 – 10 days and 7.5% presented after 10 days of fracture.

Table 5: Distribution of the study group according to mode of injury

Mode of injury	Frequency	Percent
RTA	2	5.0
Tripping/ Slipping	38	95.0
Total	40	100.0

Table 6: Distribution of the study group according to mechanism of injury

Mechanism of injury	Frequency	Percent
Direct	2	5.0
Indirect	38	95.0
Total	40	100.0

The fracture was direct in 5% of the patients and indirect in 95% of the patients.

Table 7: Distribution of the study group according to type of fracture

Type of fracture	Frequency	Percent
Garden III	15	37.5
Garden IV	25	62.5
Total	40	100.0

Table 8: Distribution of the study group according to comorbidities

Co morbidities	Frequency	Percent
Diabetes Mellitus	7	17.5
Diabetes Mellitus & Hypertension	6	7.5
Hypertension	12	30.0
Nil	15	37.5
Total	40	100.0

About 17.5% of the patients in this study had diabetes mellitus and 7.5% had diabetes mellitus and hypertension and 30% had hypertension.

Discussion

The management of fracture neck of femur is a great challenge to the orthopaedic surgeon. The elderly population reports high incidence of femoral neck fractures and is expected to increase to over six million hip fractures worldwide by year 2050 [5].

Hemiarthroplasty is the mainstay of treatment of displaced femoral neck fractures in the elderly population and have a limited life expectancy. But hemiarthroplasty cannot be the main stay of treatment as it has higher complication rates after a year and requires secondary surgery in many cases. The numbers of hip fracture are expected to increase from 1.7 million in 1990 to 6.3 million during the year 2050 [6].

Total hip replacement serves better results as a result of osteoporosis and poor bone quality in elderly people. The osteoporosis, postural imbalance, poor eye sight, poor general conditions, unsafe surroundings etc in the elderly people are highly prone for fractures.

The main methods of choices are internal function, hemiarthroplasty and total hip arthroplasty. Internal fixation is the main alternative for young patients with displaced intracapsular fractures and in frailest elderly patients who are not medically fit for the prosthesis surgery. Most surgeons seem to recommend that hemiarthroplasty is the preferred treatment for elderly patients with low functional demands in the absence of arthritic changes in the hip [7].

The high incidence of non union and avascular as it is influenced by many factors such as age of the patients, degree of osteoporosis, displacement of head, delay in reduction, type of fixation device and its final position [8].

Hemiarthroplasty avoids these complications, which result from inadequate-blood supply to the femoral head, but is often unsatisfactory in younger patients because of high incidence of acetabular erosion and pain. Infection, loosening and dislocation are other problems, which add to the poor clinical results and a need for second surgery. Repeat surgery has its own share of high incidence of medical complications and mortality [9].

A total 40 patients with acute fracture of neck of femur aged above 60 years treated with THA attending the Department of Orthopedics, constituted the sample size. The sample size was calculated by assuming a Harris hip score of 81 points with a standard deviation of 5, with a relative precision of 2% (Alpha of 5%, 95% confidence interval).

About 22.5% of the patients belonged to 63 – 64 years and 69 - 70 years. In a study by Monzon *et al*, the mean age was 83.2 years [10]. In a study by Sidhu *et al*, the mean age of the patients was 77 years [45] In a study by Sriram *et al*, the mean age was 64.6 years [11]. In a study by Mani *et al*, the mean age of the patients was 71.5 years [12].

The sex-wise distribution had shown that, 42.5% were males and 57.5% belonged to females. In a study by Monzon *et al*, the female – male ratio was 65:28. [10] Similar results were also obtained in a study by Sriram *et al*. [46] In a study by Mani *et al*, females formed 60% of the pateints [12].

About 52.5% had fracture on right side in this study. In a study by Mani *et al*, 65% had left side fracture [12].

Conclusion

- About 22.5% of the patients belonged to 63 – 64 years and 69 - 70 years.
- The sex-wise distribution had shown that, 42.5% were males and 57.5% belonged to females.
- About 52.5% had fracture on right side in this study.
- About 40% of study subjects presented to the hospital at 2 – 5 days and 35% presented on 1st day of fracture.
- This study had shown that, tripping / slipping was the main reason for fracture in 95% of the patients.

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