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Clinical profile of patients with intertrochanteric fracture of femur

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Abstract
The incidence of trochanteric fractures is more in the female population due to osteoporosis compared to male. In a Swedish study of more than 20,000 patients, the incidence of hip fractures in women doubled every 5.6 years after the age of 30 years. The trochanteric fractures can be managed by conservative methods and there is usually union of the fracture. If suitable precautions are not taken, it undergoes malunion, leading to varus and external rotation deformity and shortening and restriction of hip movements. After the patient with stable and unstable intertrochanteric fracture was admitted to hospital all the necessary clinical details were recorded in proforma prepared for this study. After the completion of the hospital treatment patients were discharged and called for follow up at outpatient level at regular intervals for serial clinical and radiological evaluation. In our study, intertrochanteric fractures were more common due to Slip and fall. Age ranged from 46 to 73 years with mean age of 60.75 years. Males were more common contributing of 85 % of cases. Right sided fractures were more common in our study accounting for 60% of cases. In our study Trochanteric fractures of 20 cases, out of which boyd and griffin type 2 consisted of 45% followed by 30% were type 3.

Keywords: Intertrochanteric Fracture, Femur, Hip Fractures

Introduction
The femur is the longest and strongest bone of the body and like all long bones consists of a shaft and two ends. It articulates at its upper end with the hip bone and at its lower end with both the patella and the tibia. The upper end of the femur comprises a head, a neck, a greater and a lesser trochanter [1].

The head of the femur is rather more than half a 'sphere' and is directed upwards, medially and slightly anteriorly. The neck is about 5cm long, connects the shaft, it is a stout bar of bone, roughly pyramidal in shape and flattened anteriorly. The long axis of the neck makes an angle of about 120-130 degrees with the long axis of the shaft and is termed the neck shaft angle. This arrangement allows greater mobility at the hip joint and enables the lower limb to swing clear of the pelvis. Anteriorly, at the junction of the shaft and the neck is a rough bony ridge, the intertrochanteric line. It begins in a tubercle at the upper and medial part of the anterior surface of the greater trochanter and is directed inferomedially where it joins the spiral line, which becomes continuous with the medial lip of the linea aspera. Posteriorly a prominent ridge of bone, the intertrochanteric crest joins the posterior aspect of the greater trochanter. On the upper part of the crest is around protuberance called the quadrate tubercle [2].

The greater trochanter is large quadrangular laterally positioned and irregular. The upper posterior margin overhangs the trochanteric fossa. The greater trochanter provides insertion for most of the muscles of gluteal region. The upper border of the greater trochanter gives insertion to the piriformis and the medial surface to the common tendon of obturator internus and two gemelli [3].

The gluteus minimus is inserted into the rough impression on its anterior surface. The gluteus medius is inserted into the oblique and flattened strip on its lateral surface. The area behind the insertion is covered by the deep fibres of gluteus maximus with the trochanteric bursa interposed. The trochanteric fossa receives the insertion of the obturator externus [4].

The lesser trochanter is a conical eminence, which projects medially and backwards from the shaft at its junction with lower and posterior part of the neck. It gives attachment to the psoas

major on its summit and iliacus at its base. The shaft of the femur is narrower in its middle, it expands a little as it is traced upwards, but it widens appreciably near the lower end of the bone. In its middle one third the shaft possesses three surfaces (anterior, lateral and medial) and three borders [posterior, lateral and medial]. In its upper one third, the shaft presents a fourth surface which is directed backwards and is called the posterior surface. This is bounded medially by the spiral line which is continuous above with the lower end of the intertrochanteric line and below with the medial lip of linea aspera [5].

The incidence of trochanteric fractures is more in the female population due to osteoporosis compared to male. In a Swedish study of more than 20,000 patients, the incidence of hip fractures in women doubled every 5.6 years after the age of 30 years. The trochanteric fractures can be managed by conservative methods and there is usually union of the fracture. If suitable precautions are not taken, it undergoes malunion, leading to varus and external rotation deformity and shortening and restriction of hip movements. It is also associated with complications like prolonged immobilization leads to bedsores, deep vein thrombosis and respiratory infections. Aim of treatment should be prevention of malunion, and early mobilization because it is more common in old people. Taking all the factors into consideration surgery by internal fixation of the fracture is ideal choice [6].

Methodology

The present study consists of 20 adult patients of stable and unstable intertrochanteric factures of femur satisfying the inclusion criteria, who are treated with Proximal Femoral nail

Criteria for selection of patients:

Inclusion criteria

- Stable intertrochanteric fractures.
- Unstable intertrochanteric fractures
- Patient aged more than 18years age who are medically fit for surgery.

Exclusion criteria

- Open hip fractures
- Pathological fractures
- Periprosthetic fractures
- Paediatric fractures (before physeal closure)

Data collection

After the patient with stable and unstable intertrochanteric fracture was admitted to hospital all the necessary clinical details were recorded in proforma prepared for this study. After the completion of the hospital treatment patients were discharged and called for follow up at outpatient level at regular intervals for serial clinical and radiological evaluation. The patients were followed up till fracture union and function recovery after surgery at regular interval and if necessary subsequent follow up was done.

Results

In our series, majority of the cases i.e. 12 (60%) were in the age group of 61-80 years, followed by 8 (40%) cases in the age group 40-60 years. The youngest patient was 46years old and eldest patient was 77 years. The mean age was years.

Table 1: Age Distribution

Age Group	Number of Patients	Percentage (%)
0-20	0	0
21-40	0	0
41-60	8	40%
61-80	12	60%
81-100	0	0

In the present series, males were more commonly involved. Majority of the patients were males – 17 cases (85%) and 3(15%) were females.

Table 2: Sex Distribution

Sex	Number of Cases	Percentage %
Male	17	85%
Female	3	15%

16 cases (80%) affected were due to Slip and fall, 4 cases (20%) due to RTA. Slip and fall was the most common mode of injury.

Table 3: Nature of violence

Nature of Violence	Number of Cases	Percentage%
Motor vehicle accidents	4	20%
Slip and fall	16	80%

Right side was involved in 12 (60%) cases and left in 8 (40%), right side was more commonly involved than left side.

Table 4: Side Affected

Side Affected	No of Cases	Percentage%
Right	12	60%
Left	8	40%

Table 5: Trochanteric Fractures are classified according to Boyd and griffin classification

Type of Fracture	No of Cases	Percentage %
TYPE1	1	5
TYPE2	9	45
TYPE3	6	30
TYPE4	4	20

In the present study, majority of the cases i.e. 45% had type 2, followed by 30% cases had type 3 Boyd and Griffin type.

Discussion

In our study, intertrochanteric fractures were more common due to Slip and fall.

Age ranged from 46 to 73 years with mean age of 60.75 years. Males were more common contributing of 85 % of cases. Right sided fractures were more common in our study accounting for 60% of cases.

In our study Trochanteric fractures of 20 cases, out of which boyd and griffin type 2 consisted of 45% followed by 30% were type 3.

The mean duration of radiation exposure was 80 seconds, mean duration of surgery was 90 minutes and mean blood loss was 120 ml.

In the intraoperative period,

- In two patients we failed to put derotation screw.
- We had one case of fixation of fracture in varus angulation.
- We had no cases of implant failure, Z-effect or Reverse Z-effect complications.

The mean duration of hospital stay was 14.9 days, mean time for full weight bearing was 14.25 weeks. Post operatively all

patients were ambulatory of which two of them required walking aids. Three patient had >1 cm shortening after fracture union which was treated conservatively by sole rise. All patients enjoyed good range of hip and knee motion except in one who had stiffness of knee improved by physiotherapy.

An author compared trochanteric fractures treated with the Gamma nail or the Proximal Femoral nail and concluded that there were no significant differences in the use of either nail in terms of the recovery of previous functional capacity, nor in terms of the time required for fracture healing. With regard to the more significant technical complications recorded, shaft fractures and the cutting-out phenomenon were more common with the use of the Gamma nail, while secondary varus occurred at a greater rate when using the PFN [7].

In a study concluded that PFN is an excellent implant for treatment of unstable fractures of proximal femur. The terms of successful outcome include a good understanding of fracture biomechanics, correct indication and exactly performed osteosynthesis [8].

In another study concluded that the PFN is a good choice for trochanter subtrochanteric fractures and also the use of the PFN for unstable trochanteric fractures is very encouraging [9]

In another study to evaluate the PFN for the treatment of 76 unstable trochanteric femoral fractures concluded PFN is a useful device in the treatment of the unstable trochanteric femoral fracture. It is a relatively easy procedure and a biomechanically stable construct allowing early weight bearing.

In a prospective randomized controlled trial of subtrochanteric femur fractures treated with a Proximal Femoral Nail compared to a 95 degree Blade plate and concluded that internal fixation of subtrochanteric femur fractures with a 95 degree angled blade plate is associated with increased implant failure and revision compared to closed intramedullary nailing using a Proximal Femoral Nail [10].

Conclusion

- Intertrochanteric fracture of the femur is common in the elderly, due to osteoporosis and in young due to high velocity trauma.
- The mode of injury for intertrochanteric fracture in the elderly is a trivial trauma, however in the young individuals it occurs following a high velocity trauma.
- Since in the elderly the mode of injury is a low velocity trauma, the incidence of associated injuries is less.
- Since the fracture is common in the elderly the incidence of associated diseases requiring medical attention is high.
- As the fracture is more common in the elderly, early reduction and internal fixation increases patient comfort, facilitates nursing care, helps in early mobilization of the patient and decreases the duration of hospitalization.

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