Effectiveness of proximal femoral nail in intertrochanteric femur fracture patients

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ABSTRACT

Background: An intertrochanteric femur fracture is a type of hip fracture that occurs in the region between the greater trochanter and the lesser trochanter of the femur bone. The present study assessed use of proximal femoral nail in intertrochanteric femur fracture patients.

Materials & Methods: 68 patients of intertrochanteric femur fracture of both genders were treated with proximal femoral nail. Parameter such as mode of injury, side, fracture subtype and outcome were recorded.

Results: Out of 68 patients, males were 38 and females were 30. The mode of injury was RTA in 38, fall in 22 and others in 8. OTA fracture type was 31 A1 in 32, 31A2 in 20 and 31 A3 in 16 cases. Laterality was right in 48 and left in 40. Complications were Z- effect in 2, inadequate reduction in 1, varus deformity in 3 and failure to insert distal screw in 1 case. Outcome was excellent in 50, good in 10, fair in 6 and poor in 2 cases.

Conclusion: Patients with intertrochanteric femur fracture patients showed good functional outcome treated with proximal femoral nailing.

Key words: Intertrochanteric femur, Hip, proximal femoral nailing
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Introduction

An intertrochanteric femur fracture is a type of hip fracture that occurs in the region between the greater trochanter and the lesser trochanter of the femur bone. The femur is the long bone located in the thigh, and the greater and lesser trochanters are bony prominences on the upper part of the femur.[1] Intertrochanteric femur fractures typically result from high-energy trauma, such as falls from a significant height or motor vehicle accidents, but they can also occur in older individuals with weakened bones due to osteoporosis. These fractures are more common in elderly people.[2]

Symptoms of an intertrochanteric femur fracture may include severe pain in the hip or thigh area, difficulty or inability to bear weight on the affected leg, swelling, bruising, and deformity or shortening of the leg. The patient may also experience limited range of motion in the hip joint.[3]Extramedullary fixation of these fractures with implants like the dynamic hip screw or the dynamic condylar screw has potential disadvantages of extensive exposure, more blood loss which then leads on to problems in fracture union

and also implant failure.[3] Intramedullary fixation is more biological as this implant is inserted after closed reduction using a minimal invasive technique.[4]Proximal femoral nail reduces the lever arm due to intramedullary location. Intramedullary devices are introduced by closed procedure with indirect fracture reduction, maintaining vascularity of the fracture zone with less disruption of the fracture hematoma. Reaming stimulates periosteal reaction and generates debris that serves as autogenous graft material at the fracture site.[5,6] The present study assessed use of proximal femoral nail in intertrochanteric femur fracture patients.

Materials & Methods

The present study comprised of 68 patients of intertrochanteric femur fracture of both genders. A written consent for the participation in the study was taken from all patients.

Data such as name, age, gender etc. was recorded. After careful examination, all were subjected to PA view and lateral x- ray view. All patients with intertrochanteric femur fracture were treated with proximal femoral nail. Parameter such as mode of injury, side, fracture subtype and outcome were recorded. Data thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

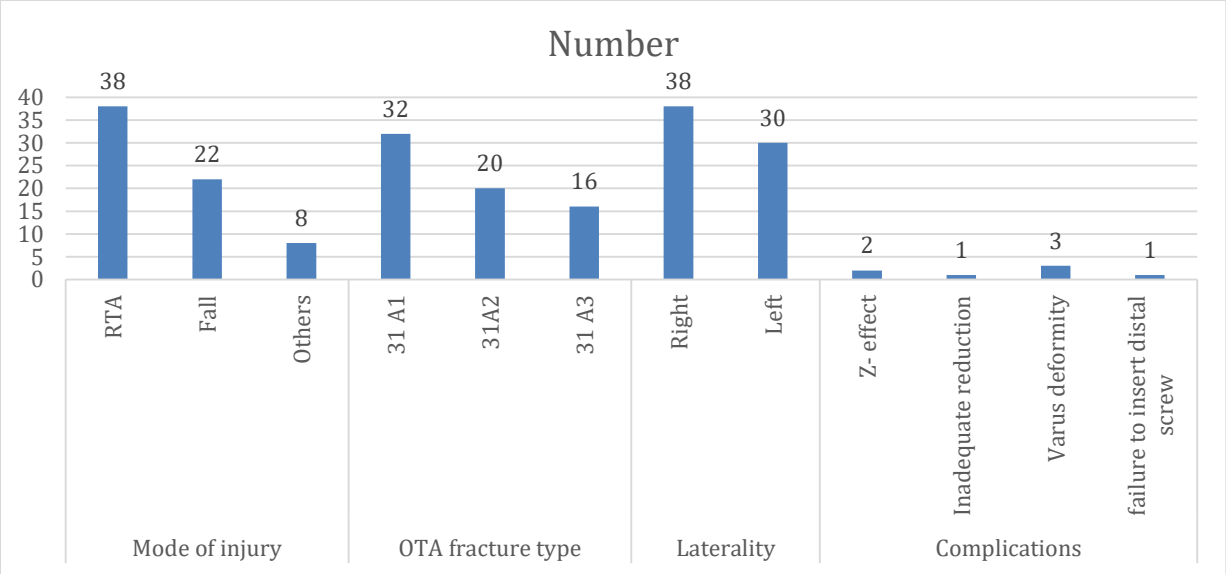
Results

Table I Distribution of patients

Total- 68		
Gender	**Males**	**Females**
Number	38	30

Table I shows that out of 68 patients, males were 38 and females were 30.

Table II Assessment of parameters



Graph I shows that mode of injury was RTA in 38, fall in 22 and others in 8. OTA fracture type was 31 A1 in 32, 31A2 in 20 and 31 A3 in 16 cases. Laterality was right in 48 and left in 40. Complications were Z- effect in 2, inadequate reduction in 1, varus deformity in 3 and failure to insert distal screw in 1 case. The difference was significant (P< 0.05).

Table III Assessment of outcome

Outcome	**Number**	**P value**
Excellent	50	0.01
Good	10	

Fair	6	
Poor	2	

Table III shows that outcome was excellent in 50, good in 10, fair in 6 and poor in 2 cases. The difference was significant (P< 0.05).

Discussion

Intertrochanteric fracture is one of the most common fractures of the hip especially in the elderly with osteoporotic bones, usually due to low-energy trauma like simple falls.[7,8] The incidence of intertrochanteric femoral fractures has increased significantly during recent decades and this tendency will probably continue in the near future due to the rising geriatric population and increase in incidence of osteoporosis.[9] The incidence of intertrochanteric fractures varies from country to country.The primary goal of the treatment has to be early mobilization to avoid secondary complications.[10] Various operative procedures with different implants have been described for the treatment of intertrochanteric fractures. Treatment options include dynamic hip screw (extramedullary fixation), gamma nail (intramedullary fixation), and proximal femoral nail (PFN) (intramedullary fixation).[11]The present study assessed use of proximal femoral nail in intertrochanteric femur fracture patients.

We found that out of 68 patients, males were 38 and females were 30. Jonnes et al[12] compared the functional and radiological outcome of PFN with DHS in treatment of Type II intertrochanteric fractures. Patients with DHS had increased intraoperative blood loss, longer duration of surgery and required longer time for mobilization while patients who underwent PFN had lower intraoperative blood loss, shorter duration of surgery and allowed early mobilization. The average limb shortening in DHS group was 9.33 mm as compared with PFN group which was only 4.72 mm. The patients treated with PFN started early ambulation as they had better Harris Hip Score in the early post-op period. At the end of 12th month, there was not much difference in the functional outcome between the two groups.

We found that mode of injury was RTA in 38, fall in 22 and others in 8. OTA fracture type was 31 A1 in 32, 31A2 in 20 and 31 A3 in 16 cases. Laterality was right in 48 and left in 40. Complications were Z- effect in 2, inadequate reduction in 1, varus deformity in 3 and failure to insert distal screw in 1 case. Papasimos et al[13]compared the pre-, intra- and post-operating variables of AMBI, TGN and PFN operations that were used for treatment of unstable trochanteric fractures, of 120 patients all above 60 years old diagnosed with extracapsular hip fractures classified as AO Type 31-A2 or Type 31-A3. According to our results the three methods are comparable in the treatment of unstable trochanteric fractures of patients above 60 years old. The AMBI remains the gold standard for the fractures of trochanteric region. TGN has an easier and faster procedure, facilitates early weight bearing and had minor late complications. An improper use of the PFN system was the reason for the most complications and the longer operation time of the device. PFN is also an accepted minimally invasive implant for unstable proximal femoral fractures but future modification of the implant to avoid Z-effect phenomenon, careful surgical technique and selection of the patients should reduce its high complication rate.

We found that outcome was excellent in 50, good in 10, fair in 6 and poor in 2 cases. Malik et al[14] assessed 40 patients with fracture intertrochanteric femur. Fractures are evaluated as stable and unstable fractures according to Modified Evan- Jensen classification. Majority of the patients were males (65%) and had age between 61-80 years (52.5%) with mean age of 71.58 ± 12.37 years. Majority of the patients had operative time more than equal to 1 hour. Harris Hip Score at 1 month was 71.10 ± 5.52, while at 3 months it was 80.13 ± 7.97. There was a statistically significant increase in the mean Harris Hip Score at 3 months in comparison to 1 month. The mean Harris Hip Score at 1

month was 71.10 ± 5.52. There was a statistically significant increase in the mean Harris Hip Score at 6 months in comparison to 3 months.

Rai et al[15] evaluated the outcome of proximal femoral nail Antirotation II (PFN-A2) in the treatment of trochanteric fractures in 25 elderly patients. The mean operating time was 85.6 minutes. Radiological union was seen in all of the 25 patients. The mean time for fracture union time in our study was 13.8 weeks. The average Harris Hip Score in our study was calculated at three months as 74.3 and at six months as 85.08. The p-value was highly significant for this improved outcome. This study found PFN-A2 related secondary varus deformities in 8.0% of the patients (two patients). Only one patient (4%) developed surgical site infection (SSI).

Conclusion

Authors found that patients with intertrochanteric femur fracture patients showed good functional outcome treated with proximal femoral nailing.

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