A Prospective Study of the Functional Outcome of Intertrochanteric Femoral Fracture Managed with Short Proximal Femoral Nail

Arnik Purohit[1], Preetesh Choudhary[2], Shreesh Phatak[3]

ABSTRACT

Introduction: Fractures through the intertrochanteric line of the upper end of the femur, and peritrochanteric fractures, unite readily no matter what treatment is used because the broad fractured surfaces are richly supplied with blood and there is seldom wide displacement. But at the same time, unless suitable precautions are taken, the fracture may unite in a position of coxavara with shortening of the limb and limitation of hip movements. Hence we conducted a study in our set up to know the functional result of short proximal femoral nail (PFN) in treatment of these fractures.

Material and Methods: We included all intertrochanteric fracture of femur in skeletally mature patient who are fit for surgery in our study. Fifty patients treated with short PFN were included in the study.

Results: Majority of the patient in our study were between 61-80 years with a mean age of 74.46 ± 12.04 years. About 52 percent of the patients were female and 48 percent male. Fall at home was the most common mode of injury. Right hip was involved in 48% of the patient and left hip was 52%. The short PFN required shorter incisions, less blood loss and operative times. Average time for operation was 42.30±10.01. Post operative complications included revision surgery 2 (4.0%) patients, superficial infection in 2 (4.0%), Z effect in 1 (2.0%) patient, inadequate reduction in 1 (2.0%) patient, difficulty in distal locking in 1 (2.0%) patient and varus in 1 (2.0%) patient. The average harris hip score came out to be 87.37 at 24 weeks and 90% of the patients belonged to the 'good' group and 6% of the patients belonged to the 'excellent' group intertrochanteric fractures, treated with short PFN, had significantly better outcomes with all patients having good results in 24 weeks which is very short time. **Conclusion:** Intra operative technical difficulties associated with short PFN can be reduced by thorough knowledge and understanding of both the anatomy and implant. By using some technical tips difficult closed reduction can be done and internal fixation with PFN can be attempted.

Keywords: Femur, Intertrochanteric Fracture, Proximal Femoral Nail, Intramedullary Device, Harris Hip Score

INTRODUCTION

Intertrochanteric fractures of femur are one of the most common fractures seen in today's orthopedic practice. Because of the complex stress configuration in this region and its non-homogeneous osseous structure and geometry, fractures occur along the path of least resistance through the proximal femur.[1] Gulberg et al has predicted that the total number of hip fractures will reach 2.6 million by 2025 and 4.5 million by 2050.[2] In 1990 26% of all hip fractures occurred in Asia whereas this figure could rise to 37% in 2025 and 45% in 2050.[3] In young and healthy individuals, the injury results from high energy trauma, whereas in the elder age group, most of the fractures are osteoporotic, resulting from a trivial fall.[4]

Treatment options for such fractures are operative as well as non-operative. Non operative measures need prolonged immobilization and consists of problems like hypostatic pneumonia, decubitus ulcers, and embolism etc. As there is bulky musculature attachment in pertrochanteric region, with is no control over the proximal fragment, non- operative measures usually result in malunion. Surgical treatment should provide stable fixation and early mobilization and weight bearing. Since it reduces morbidity and mortality DHS is the gold standard treatment for intertrochanteric fractures.[5]

In case of unstable intertrochanteric fractures the incidence of limb shortening, medialization of distal fragment and implant cutouts is high.[1] This led to the development of intramedullary implants. These devices have the advantage of being an intramedullary fixation device, shorter lever arm of device causing less tensile strain on the implant, controlled fracture impaction due to incorporation of sliding hip screw, shorter operative duration, less soft tissue dissection and early mobilization. Many internal fixation devices have been recommended, but because of high incidence of complications like non-union and implant failure, a series of evolution in designing a perfect implant has begun. The recent literature has demonstrated a change of practice in the treatment of intertrochanteric fractures, with a dramatic increase in the number of intramedullary devices being used.

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This increase has not been backed up by scientific evidence but has been driven by other factors, including marketing by industry, surgeon preference, and reimbursement.[6] Hence we conducted a study in our set up to know the functional result of short proximal femoral nail in treatment of these fractures.

MATERIAL AND METHODS

This study was conducted in Arihant Hospital & Research Centre, Indore from April 2018 to Dec 2019. During this period adult patients with intertrochanteric fractures of femur were classified according to AO/OTA classification and 50 patients were selected according to inclusion criteria. All the procedures described in this article were approved by the local ethics committee. All patients gave written informed consent to take part in the study. This study was conducted with due emphasis for clinical observation and analysis of results after surgical management of these fractures of femur with proximal femoral nailing.

Patients with intertrochanteric fractures admitted for the study were recorded in a Performa prepared for the study. Following the treatment patients were discharged and followed up at outpatient department at regular intervals for clinical and radiological evaluation. Patients were followed up till fracture union and functional recovery. If necessary, subsequent follow up was done. At the arrival of the patient with these fractures, patients were resuscitated depending on their general condition. Fracture was stabilized using skin traction. A thorough preoperative assessment of the patients was done, which included the following like general condition of the patient and clinical and radiological assessment of the fracture, type and size of fragments. Clinical examination like inspection, palpation, measurements, movements and associated injuries findings were noted. X-Rays of pelvis with both hips-AP view, hip with femur full length of involved side- AP & lateral views and chest PA view were done.

All the patients were shifted to ward with skin traction and put on a 3 kg weight varying on the built. Analgesics and antibiotics were given accordingly. Patients were evaluated for associated medical problems and reference was taken from respective departments and necessary treatment started. Associated injuries were evaluated and treated simultaneously. All patients were operated on an elective basis.

Inclusion Criteria

1) All skeletally matured patients with intertrochanteric fractures of femur
2) Intertrochanteric fracture confirmed with appropriate radiographs
3) Patients who are medically fit for surgery

Exclusion Criteria

1) Intertrochanteric fractures with reverse obliquity patterns and those with subtrochanteric extension
2) Patients unfit for the surgery
3) Patients with compound or pathological fractures
4) Patients admitted for re-operation
5) Patients who have not given written consent for surgery
6) Polytrauma

Proximal Femoral Nail-Implant Details

The implant consisted of a proximal femoral nail, self-tapping 6.5 mm derotation screw, and 8 mm hip/lag screw and 4.9 mm distal locking bolts. End cap was optional. The nail is made up of 316L stainless steel or titanium alloy. In our study we used a short PFN (commonly called TFN)- with distal diameter of 9, 10 & 11 mm and the proximal diameter of 14 mm. The proximal de-rotation screw of 6.5 mm and hip screw of 8 mm and distal locking was done with 4.9 mm bolts. The nail was universal with 6 degrees mediolateral angulation and with varying neck shaft angle.

Operative technique for proximal femoral nail

Most of these patients were operated under regional anaesthesia in the form of spinal anaesthesia. After induction of anaesthesia, patient was placed in supine position on the fracture table with adduction of the affected limb by 10-15 degree and closed reduction of the fracture was done with traction and rotation. In certain cases the limb was flexed 10-15 deg to bring the distal fragment in alignment with the proximal fragment. The unaffected limb was abducted as far as possible in order to accommodate the image intensifier. Alternatively the limb can be abducted and flexed as the fracture table permits. The image intensifier was positioned so that simultaneous anterior-posterior and lateral views could be taken.

Approach

The tip of the greater trochanter was located by palpation or occasionally by using image intensifier in obese patients. A 5 cm longitudinal incision was taken proximal to the tip of trochanter. Fascia lata was opened in line with the incision and gluteus medius was split in line with the fibers and tip of the trochanter was exposed [Fig. 1].

Entry point and insertion of guide wire

Using a straight bone awl, entry point [Fig. 2] was made on the tip of the greater trochanter, being slightly lateral in AP view and centring in the lateral view. Awl was driven into the cancellous bone till the marrow was opened. Following which the guide wire was passed through the same path into the marrow and guided across the fracture using a T-handle under image intensifier.

Over the guide wire, cannulated rigid reamer no. 14 was inserted and manual reaming was done to accommodate the proximal end of the proximal femoral nail. After confirming satisfactory reduction an appropriate size nail [Fig. 3] as determined preoperatively was assembled to the insertion handle and inserted manually over the guide wire using gentle twisting movements of the handle till the 8 mm hip screw hole coincided with the inferior aspect of the neck in the image intensifier. In cases where satisfactory reduction was not possible, open reduction was undertaken. In the end guide wire was removed. The total duration of surgery and total blood loss were calculated according to the net weight of mops soaked with blood.

Post-Operative Rehabilitation

Patient's vitals were monitored. Foot end elevation was given overnight. Drain was monitored. Antibiotics were given as per the hospital protocol. Analgesics were given as per the patient compliance. Blood transfusion was given depending upon preoperative general condition and intraoperative blood loss. Patients were encouraged to sit in the bed on 3rd day and were taught quadriceps exercises and knee mobilization. Time duration from surgery to mobilization was noted. Sutures were removed on day 12th to 15th postoperative day. Protocol followed in our institution for post-operative weight bearing was as follows: PWB -3rd POD to 6 weeks post-op; and FWB ->6 weeks post-op / signs of radiological union. Patients were discharged from the hospital at variable intervals depending on their general condition and status of the wound and the duration of stay in the hospital were noted.

RESULTS

The table 1 shows the distribution of patients according to age; 1(2.0%) patient was in the age group 38-40 years, 6 (12.0%) patients were in the age group 41-60 years, 31 (62.0%) patients were in the age group 61-80 years and 12 (24.0%) patients were in the age group >80 years. The mean age in our study patients was 74.46 ± 12.04 years (Range: 38.0 years to 102.0 years). Majority of the patients in our study were in the age group more than 60 years. There were 26 (52.0%) females and 24 (48.0%) males in our study, showing a slight female preponderance in the study.

The table 1 shows the distribution of patients according to age; 1(2.0%) patient was in the age group 38-40 years, 6 (12.0%) patients were in the age group 41-60 years, 31 (62.0%) patients were in the age group 61-80 years and 12 (24.0%) patients were in the age group >80 years. The mean age in our study patients was 74.46 ± 12.04 years (Range: 38.0 years to 102.0 years). Majority of the patients in our

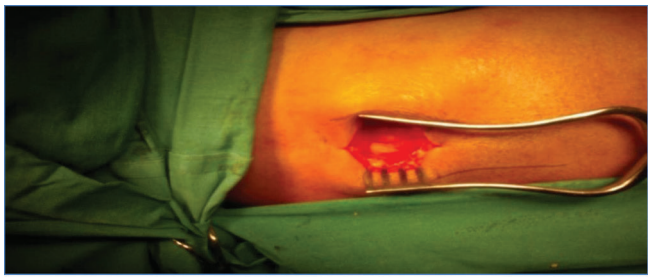


Figure-1: Percutaneous technique

Figure-2: Entry point

Age Group	Number	Percentage
38-40 years	1	2.0
41-60 years	6	12.0
61-80 years	31	62.0
>80 years	12	24.0
Total	50	100.0
Sex		
Female	26	52.0
Male	24	48.0
Total	50	100.0

Table-1: Distribution of patients according to age, sex

Side Involvement	Number	Percentage
Left side	26	52.0
Right side	24	48.0
Total	50	100.0

Table-2: Distribution of patients according to side involvement

Mechanism of Injury	Number	Percentage
Fall at home	34	68.0
RTA	16	32.0
Total	50	100.0

Table-3: Distribution of patients according to mechanism of injury

Hospital Stay	Number	Percentage
3-5 days	41	82.0
6-7 days	8	16.0
>7 days	1	2.0
Total	50	100.0

Table-4: Distribution of patients according to hospital stay

Adverse Events	Number	Percentage
Revision surgery	2	4.0
Superficial infection	2	4.0
Z effect	1	2.0
Inadequate reduction	1	2.0
Distal locking	1	2.0
Varus	1	2.0
Total	50	100.0

Table-5: Distribution of patients according to adverse events

Time Interval	No.	Harris Hip Score [Mean ± SD]	't' value	P value
6 weeks	50	34.23 ± 1.52	-86.278, df=49	0.000*
12 weeks	50	57.75 ± 1.92		
12 weeks	50	57.75 ± 1.92	-67.163, df=49	0.000*
24 weeks	50	87.37 ± 2.14		

Paired 't' test applied. P value < 0.05 was taken as statistically significant

Table-6: Comparison of mean Harris Hip Score at different time intervals

Age Group	Harris Hip Score (at 24 weeks)				Total
	Poor	Fair	Good	Excellent	
38-40 years	0 0.0%	0 0.0%	1 100.0%	0 0.0%	1 100.0%
41-60 years	0 0.0%	0 0.0%	6 100.0%	0 0.0%	6 100.0%
61-80 years	0 0.0%	0 0.0%	28 90.3%	3 9.7%	31 100.0%
>80 years	0 0.0%	0 0.0%	12 100.0%	0 0.0%	12 100.0%
Total	0 0.0%	0 0.0%	47 94.0%	3 100.0%	50 100.0%
Pearson chi-square value = 1.956, df=3, p value = 0.582, Not significant					

Table-7: Association between age and Harris Hip score at 24 weeks

Sex	Harris Hip Score (at 24 weeks)				Total
	Poor	Fair	Good	Excellent	
Female	0 0.0%	0 0.0%	23 88.5%	3 11.5%	26 100.0%
Male	0 0.0%	0 0.0%	24 100.0%	0 0.0%	24 100.0%
Total	0 0.0%	0 0.0%	47 94.0%	3 100.0%	50 100.0%
Pearson chi-square value = 2.946, df=1, p value = 0.086, Not significant					

Table-8: Association between sex and Harris Hip score at 24 weeks

Side Involved	Harris Hip Score (at 24 weeks)				Total
	Poor	Fair	Good	Excellent	
Left side	0 0.0%	0 0.0%	24 92.3%	2 7.7%	26 100.0%
Right side	0 0.0%	0 0.0%	23 95.8%	1 4.2%	24 100.0%
Total	0 0.0%	0 0.0%	47 94.0%	3 100.0%	50 100.0%
Pearson chi-square value = 0.275, df=1, p value = 0.600, Not significant					

Table-9: Association between side involved and Harris Hip score at 24 weeks

Mechanism of Injury	Harris Hip Score (at 24 weeks)				Total
	Poor	Fair	Good	Excellent	
Fall at home	0 0.0%	0 0.0%	31 91.2%	3 8.8%	34 100.0%
RTA	0 0.0%	0 0.0%	16 100.0%	0 0.0%	16 100.0%
Total	0 0.0%	0 0.0%	47 94.0%	3 100.0%	50 100.0%

Table-10: Association between mechanism of injury and Harris Hip score at 24 weeks

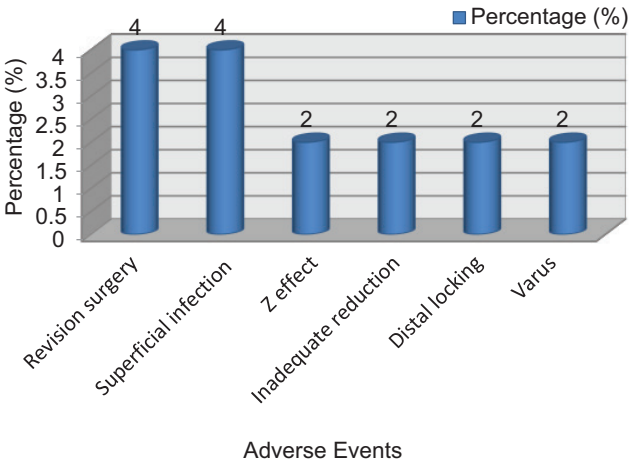
study were in the age group more than 60 years. There were 26 (52.0%) females and 24 (48.0%) males in our study, showing a slight female preponderance in the study.

The table 3 shows the distribution of patients according to mechanism of injury; 34 (68.0%) patients sustained injury due to fall at home, while 16 (32.0%) patients sustained injury during a road traffic accident. Majority of the patients sustained injury due to fall at home.

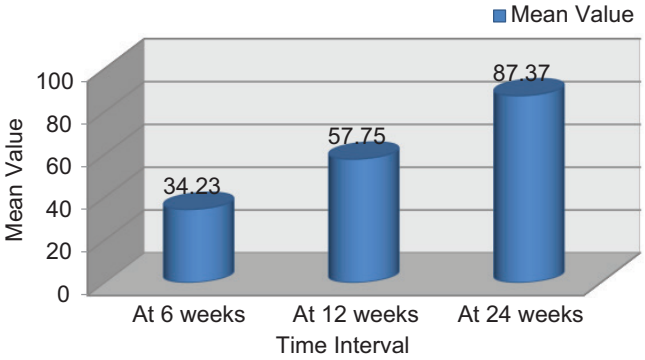
The table 4 shows the distribution of patients according to hospital stay; 41 (82.0%) patients had a hospital stay between 3 to 5 days, 8 (16.0%) patients had a hospital stay between 6 to 7 days and only 1 (2.0%) patient had a hospital stay beyond 7 days. The mean hospital stay in our study was 4.54 ± 1.07 days (Range: 3.0 days to 8.0 days).

The table 5/fig. 2 shows the adverse events seen in our study. Revision surgery was done in 2 (4.0%) patients, superficial infection was seen in 2 (4.0%), Z effect was seen in 1 (2.0%) patient, inadequate reduction was seen in 1 (2.0%) patient, distal locking was seen in 1 (2.0%) patient and varus was seen in 1 (2.0%) patient.

The table 6/Fig. 3 shows the comparison of mean Harris Hip Score at different time intervals. At 6 weeks the mean Harris



Graph-1: Bar diagram showing adverse events seen in the present study



Graph-2: Bar diagram showing comparison of Harris Hip Score at different time intervals

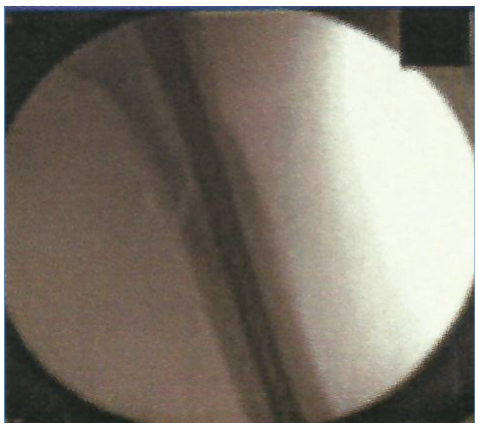


Figure-3: Insertion of nail

Hip Score was 34.23 ± 1.52, while at 12 weeks it was 57.75 ± 1.92. The difference was found to be statistically significant (p=0.000), showing a higher Harris Hip Score at 12 weeks in comparison to the 6 weeks. At 12 weeks the mean Harris Hip Score was 57.75 ± 1.92, while at 24 weeks it was 87.37 ± 2.14. The difference was found to be statistically significant (p=0.000), showing a higher Harris Hip Score at 24 weeks in comparison to the 12 weeks. Thus, there was significant improvement in Harris Hip Score from 6 weeks to 24 weeks, giving a good functional outcome.

The table 7 shows the association between age and the Harris Hip Score at 24 weeks. There was no statistically significant association seen between age and Harris Hip Score at 24 weeks (p=0.582), showing that Harris Hip Score is not dependent on the age of the patients.

The table 8 shows the association between sex and the Harris Hip Score at 24 weeks. There was no statistically significant association seen between sex and Harris Hip Score at 24 weeks (p=0.086), showing that Harris Hip Score is not dependent on the sex of the patients.

The table 9 shows the association between side involved and the Harris Hip Score at 24 weeks. There was no statistically significant association seen between side involved and Harris Hip Score at 24 weeks (p=0.600), showing that Harris Hip Score is not dependent on the side of involvement of injury.

The table 10 shows the association between mechanism of injury and the Harris Hip Score at 24 weeks. There was no statistically significant association seen between mechanism of injury and Harris Hip Score at 24 weeks (p=0.220), showing that Harris Hip Score is not dependent on the mechanism of injury. The mean operative time in our study was 42.30 ± 10.01 minutes. (Range: 20.0 minutes to 70.0 minutes).

Observations

Fractures of inter-trochanteric femur have always posed a major challenge for the treating orthopaedician, not only for achieving union of the fractures, but also for restoration of optimal function of lower limb in the shortest possible time. Accordingly the aim of management has changed to achievement of early mobilization, rapid rehabilitation and early return to their initial pre-morbid home and work environment.

Internal fixation allows for very early rehabilitation and

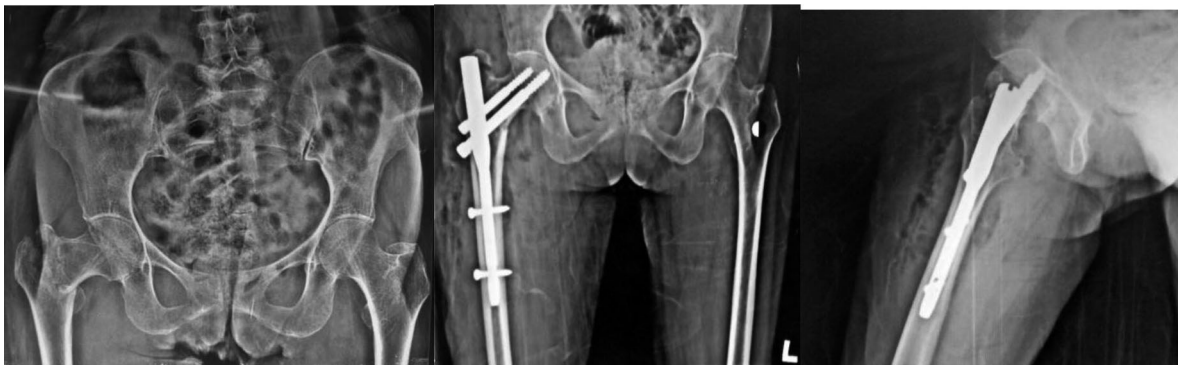


Figure-4: Short proximal femoral nail (PFN) implants

offers a better chance of functional recovery, and hence has become the treatment of choice in all fractures in the trochanteric region. Amongst the various types of implants available i.e. fixed nail plate devices, sliding nail/screw plate and intramedullary devices, the compression hip screw is most commonly used (as it still remains the Gold Standard) but recently technique of closed intramedullary nailing have gained popularity.

Intramedullary devices are placed close to the mechanical axis of femur so moment arm is less in them leading to less tensile stress, thus they behave as load sharing devices. In this study an attempt was made to survey, evaluate, document and quantify our success in the management of such individuals by using short Proximal femoral nail (PFN) implants and analysis of the result in patients managed with short PFN [Fig. 4]. The study was conducted on fifty patients of proximal femoral fractures attending out-patient/casualty department of Orthopaedics, Arihant Hospital and Research Centre, Indore from January 2018 to December 2018.

Most of the patients in the present study of 50 cases were in the age group of 61 to 80 years. The maximum age was 102 years and the youngest was 38 years. The mean age was 74.46 ± 12.04 years. Intertrochanteric fracture is occurs in old age but it can be in young adult with high energy trauma such as RTA. The average age reported by other workers is as follows

Name of worker	Age in years
Boyd and Griffin et al (1949)[7]	69.7
Evans et al (1951)[8] Males	62.6
Females	74.3
Sarmiento et al (1963)[9]	71.9
Kumar et al (2011)[10]	69.3
Bhakat et al (2013)[11]	67.8

In this study number of male patient and female patient were almost same with slight high female patient in my study group 24 males and 26 females patient. Kumar et al[10] study had 20 males and 30 females. Bhakat et al[11] study had 26 males and 37 females. Boyd and Griffin[7] in their study of 300 cases found marked sex difference. 226(45.8%) of the patients were females and 74 (24.2%) were males. Pajarinen et al[12] study had 27 males and 81 females. Aktselis et al[13] study had 15 males and 56 females. Cleveland et al[14] in their study had 87.7% of female patients. They had given the following explanations for their observations which are as follows:

a. Females have slightly wider pelvis with a tendency to having coxa vara.
b. They are usually less active and are more prone to senile osteoporosis.

Our present study shows that out of 50 cases 24 were right sided and 26 were left sided.

Kumar et al[10] study had 21 right sided and 29 left sided cases. Aktselis et al[13] study showed 39 right side and 32 left sided cases. Though our study showed left sided dominance it appears to be a purely coincidental finding. In Most of our patients domestic fall (slip and fall at home) was the main reason behind fracture while in road traffic accident (RTA). In our present study 34 cases were of slip and fall at home and 16 cases got the fracture by Road traffic accident. This may be attributed to the factors given by Cummings and Nevitt in 1994[15] like inadequate protective reflexes, to reduce energy below critical threshold; inadequate local shock absorbers e.g. muscle and fat around hip; and inadequate bone strength at the hip on account of osteoporosis or osteomalacia.

Young patients with intertrochanteric fractures sustained trauma either as a result of road traffic accident, there by reflecting the requirement of high velocity trauma to cause fracture in the young. Koval et al (1996)[16] observed 90% of hip fractures in the elderly result from a simple fall. Hip fractures in young adults were observed to result most often with high energy trauma such as motor vehicular accidents Kumar et al[10] study observed 31 cases due to domestic fall in the elderly and 19 cases due to Road traffic accident in the young.

In our present study most of our patients were operated on 2nd day. The maximum number of patients was discharged in 3-5 days (82%). The average number of days in hospital is 4.54 ± 1.07 days. The cases who had delay in surgery or /and long hospital stay were due to associated co morbid conditions and were not fit for surgery. The delay was due to physician clearance.

Urgent surgical intervention is necessary for early rehabilitation and so mobilization is possible which generate self confidence in patient. Thereby improvement in the general well-being of the patient occurs. According to Evans[8] 30% mortality rate occurs in conservative line of treatment using long term immobilization. Active surgical approaches decrease the mortality to less than 15%. In patients young age there are also socioeconomic problems, long lasting elimination from working process of even loss of job. Kumar et al[10] study showed average number of days in hospital 13.16. Pajarinen et al[12] study showed average number of days in hospital 6 days. The mean operative time in our study was 42.30 ± 10.01 minutes (range: 20.0 minutes to 70.0 minutes). The maximum duration is was 70 min. On comparing with the other studies

Study	PFN
Pajarinen et al[12]	55 (35-200)
Saudan et al[17]	64 ± 33
Zhao et al[18]	46.5 ± 20.5
Kumar et al[10]	55
Bhakat et al[11]	48.73±22.7
Aktselis et al[13]	45.7±22.7

In our study we have faced 8 complications. Revision surgery was done in 2 (4.0%) patients, superficial infection was seen in 2 (4.0%), Z effect was seen in 1 (2.0%) patient, inadequate reduction was seen in 1 (2.0%) patient, distal locking was seen in 1 (2.0%) patient and varus was seen in 1 (2.0%) patient. Infection was seen in only two cases. It was superficial and was debrided on the 3rd post op day. The patient was continued on 3 weeks of intravenous antibiotics.

The implant was left in place. The patient did well after that. One case had Z effect which was treated with revision surgery and long PFN exchange nailing was done. One case had varus deformity which was treated with revision surgery One case had difficulty in doing distal locking so only one screw fixed distally.

Bhakat et al[11] study showed 2(6%) cases of varus angulation and 2 cases (6%) of infection. In PFN series the study showed 3 cases (9%) in which they could not fix antirotaion screw and 1 case (3%) with Z effect out of 30 cases. B. Kish et al (2018)[19] revealed that complications were malfixation (internal-rotation, varus, valgus, shorting, bad position of the screw in the neck) –10%, deep infection 0.7%, non-union 1%, cut out 2%, nail breakage 0.6%, broken drills, and bad position of locking screws. They noted solutions were re-operation 1.6%, T.H.R. 1.3%, removal of nail 1.6%, and nail changes 0.9%.

In our present study the average Harris Hip Score after 6 weeks was 34.23 ± 1.52. The average Harris Hip Score after 12 weeks was 57.75 ± 1.92 and the average Harris Hip Score after 24 weeks was 87.37 ± 2.14. The results are comparable with the studies done by Pajarinen et al[12] and Saudan et al[17]. Bhakat et al[11] study showed result with Harris Hip Score after 1 year was 92.57 with standard deviation of 3.58. Kumar et al[10] study showed similar result with Harris Hip Score after 1 year was 93 with standard deviation of 2.7.

At 6 weeks the mean Harris Hip Score was 34.23 ± 1.52, while at 12 weeks it was 57.75 ± 1.92. The difference was found to be statistically significant (p=0.000), showing a higher Harris Hip Score at 12 weeks in comparison to the 6 weeks. At 12 weeks the mean Harris Hip Score was 57.75 ± 1.92, while at 24 weeks it was 87.37 ± 2.14. The difference was found to be statistically significant (p=0.000), showing a higher Harris Hip Score at 24 weeks in comparison to the 12 weeks. Thus, there was significant improvement in Harris Hip Score from 6 weeks to 24 weeks, giving a good functional outcome.

The association between age and the Harris Hip Score at 24 weeks Pearson chi-square value = 1.956, df=3, p value = 0.582, not significant. There was no statistically significant association seen between age and Harris Hip Score at 24 weeks (p=0.582), showing that Harris Hip Score is not dependent on the age of the patients Pearson chi-square value = 2.946, df=1, p value = 0.086, not significant association between sex and the Harris Hip Score at 24 weeks, Pearson chi-square value = 2.946, df=1, p value = 0.086, not significant.

There was no statistically significant association seen between sex and Harris Hip Score at 24 weeks (p=0.086), showing that Harris Hip Score is not dependent on the sex of the patients, the association between side involved and the Harris Hip Score at 24 weeks. There was no statistically significant association seen between side involved and Harris Hip Score at 24 weeks (p=0.600), showing that Harris Hip Score is not dependent on the side of involvement of injury. There was no statistically significant association seen between mechanism of injury and Harris Hip Score at 24 weeks (p=0.220), showing that Harris Hip Score is not dependent on the mechanism of injury.

CONCLUSION

Finally, we conclude that the short PFN is a significant advancement in the treatment of intertrochanteric fractures which has the unique advantages of closed reduction, preservation of fracture hematoma, less tissue damage, early rehabilitation and early return to work and good functional outcome. Osteosynthesis using a short PFN, used in intertrochanteric fractures, resulted in excellent stabilization, few mechanical complications and good functional results. Thus the treatment of intertrochanteric fracture with short PFN had a more favorable outcome and it is one of the implant of choice for intertrochanteric fractures at present.

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