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Original Article

Short versus long proximal femoral nail in the management of intertrochanteric fractures - a comparative study

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Abstract: Introduction: Intertrochanteric fractures are those that occur in the region spanning from the extracapsular basilar neck region to the region along the lesser trochanter proximal to the development of medullary canal. Low-energy falls account for 90% of fractures in people over the age of 50, with females having a higher prevalence. Intertrochanteric fractures in children and teenagers are caused by high-energy trauma. The aim of this study was to compare the functional and radiological outcomes as well as complications of intertrochanteric fractures treated with long proximal femoral nail (PFN) versus short proximal femoral nails. Methods: The study was a clinical randomized prospective comparative study which included 30 (2 groups of 15 patients each, being treated with short and long PFNs respectively) skeletally mature patients with fresh (less than 3 weeks old) intertrochanteric fractures of femur AO/OTA 31-A1, AO/OTA 31-A2 or AO/OTA 31-A3 as per AO/OTA classification. Harris Hip score was used to compare the functional outcomes. Results: The average age of patients in short PFN group (Group A) was 62.1 ± 15.77 years and in long PFN group (Group B), it was 54.1 ± 10.8 years. Male-female ratio in the study was 1.7:1. A031A2 of AO fracture classification was the most common type of fracture in both the groups. The mean injury to surgery interval in Group A was 9.6 ± 4.45 days and in Group B, it was 6 ± 4.12 days. The mean operative duration in Group A was 68.6 ± 6.62 minutes and in Group B, it was 78.6 ± 7.35 minutes. The average time of union in Group A was 15.69 ± 2.72 weeks while that of Group B was 15.77 ± 2.05 weeks. The average Harris Hip score at final follow up in Group A was 81.0 ± 11.62 and in Group B, it was 80.3 ± 10.83. There was 1 case of implant failure in each group, which were re-operated. One case of screw back-out in Group A led to a varus collapse and had to be reoperated. One case of non-union was reported in Group B. One case of superficial wound infection was reported in each group. Conclusion: The Proximal Femur Nail can be used as an efficient implant to manage per trochanteric fractures regardless of the length of the implant. However, the mean operative time was found to be lower when a short nail is used.

Keywords: Intertrochanteric fracture, proximal femoral nail, AO/OTA classification, Harris Hip score, implant failure, varus collapse

Introduction

Intertrochanteric fractures are those that occur along the region proximal to the development of the medullary canal, spanning from the extracapsular basilar neck region to the region along the lesser trochanter. The intersecting cancellous compression and tensile lamellar networks, as well as the fragile cortical bone, are damaged in this proximal metaphyseal region of bone, resulting in a spectrum of fractures. The fracture fragments and connected muscle groups are displaced as a result of this. After surgical repair, these structures are subjected to multiplanar stresses [1]. Low-energy falls account for 90% of fractures in people over the age of 50, with females having a higher prevalence. Intertrochanteric fractures in children and teenagers are caused by high-energy trauma. The main goal of treating these fractures is to get a hip joint that is painless, stable and functioning. There are various treatment

methods available, ranging from conservative to extramedullary and intramedullary internal fixation methods with their own pros and cons. Unstable fracture patterns are linked to higher surgical complexity and recovery. Posteromedial fragmentation, basicervical patterns, reverse obliquity patterns, displaced greater trochanteric (lateral wall) fractures, and inability to reduce the fracture prior to internal fixation are all examples of unstable characteristics. Post-surgical stability denotes the likelihood of a successful union with no deformity or implant failure. Sliding implant devices, however, can cause considerable deformity [1].

The present debate over implant selection is centred on how much deformity and fracture site motion is acceptable for a full functional recovery. Since the first reports of surgical treatment for pertrochanteric fractures, the literature has indicated that several fracture patterns, such as subtrochanteric fractures, reverse obliquity fractures, and fractures with lateral wall fracture extension, are not amenable to fixation with basic screw/nail side plate devices. Cephalomedullary nails (CMN) are being frequently used worldwide in the treatment of intertrochanteric fractures. In the United States and Europe, intramedullary repair of intertrochanteric fractures has increased significantly from 3% to 67% [2]. In the late twentieth century, the goal of surgical research on internal fixation was to reduce implant failure and cutout of the femoral head and neck fixing components while accepting the loss of fracture reduction. Fracture mal-union was not thought to be a factor in functional recovery. CMNs were originally all short, but because of concerns about stress risers and the resulting breakage at the nail tip, full length nails were produced [3]. With older nail designs, postoperative femoral shaft fracture rates ranged from 6 to 17 percent [4].

Although there is a decrease in peri-prosthetic fracture rates with improved nail designs, there is still a risk of the same. Short and long CMNs are being employed to treat intertrochanteric fractures, each having its own set of benefits and drawbacks [5]. Meanwhile there has been some debate about the nail's length. It has been observed that using a short PFN has its perks like a shorter operative time, less perioperative blood loss and a resultant lower rate of blood transfusion. However, there may be issues like peri prosthetic fractures, post operative anterior thigh pain and inadequacy of diaphyseal fixation in cases with subtrochanteric extension of fracture. On the other hand, proponents of long PFN argue that it has a lower rate of periprosthetic fractures and post operative thigh pain. Furthermore, it can be used to fix intertrochanteric fractures with subtrochanteric extension. While the cons of the latter being longer operative time, greater perioperative blood loss and greater transfusion rate. Another challenge to face is when a curve mismatch between the nail and femoral bow may perforate the anterior cortex. There is no apparent consensus in the literature on which is the better option for treating intertrochanteric fractures-A long or short PFN. The goal of this study is to come to a reliable conclusion about the usage of short vs. long PFN for the optimal management of intertrochanteric fractures.

Methods

Study design

This study was a clinical randomized prospective comparative study done at a tertiary health care centre. It was conducted after approval from Institutional Ethical Committee (D. No. 190/FM/IEC). Adult patients (>20 years of age) who have sustained a fresh intertrochanteric fracture (<3 weeks old) and presented either to the triage or OPD of Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University between December 2019 and November 2021 and met our inclusion criteria were informed regarding the study in all aspects. Those who gave an informed written consent were allowed to participate in the study.

Inclusion and exclusion criteria

Thirty skeletally mature patients of both sexes with fresh (less than three weeks old) intertrochanteric fractures of femur, as per AO/OTA classification were included in the study. Pathological fractures (other than osteoporosis) including patients on chemo-radiotherapy, compound fractures, poly-trauma patients and patients with ipsilateral femoral shaft fractures were excluded.

Patient randomization and group allocation

A total of 30 patients were included in the study, fifteen patients in short PFN (Proximal

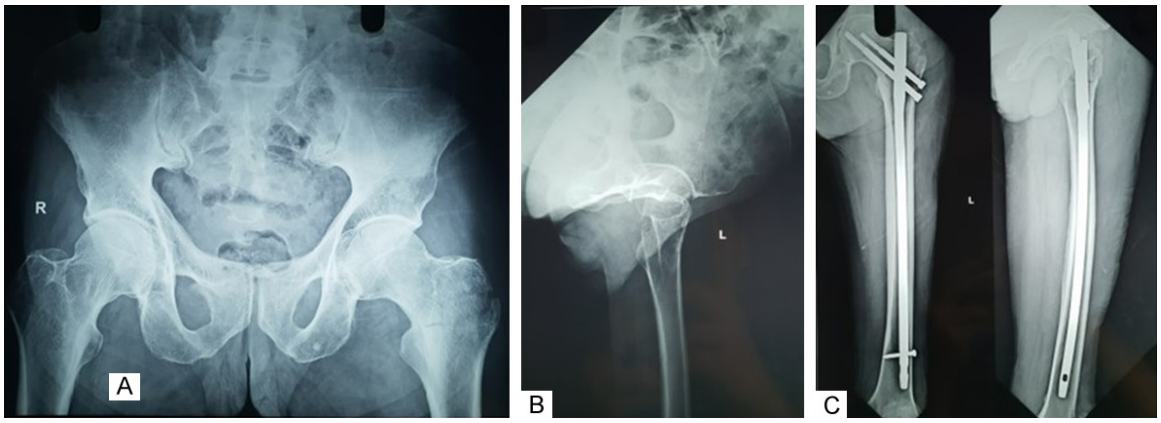

Figure 1. A. Preoperative Anteroposterior (AP) radiograph of an adult patient showing left hip intertrochanteric fracture. B. Preoperative lateral radiograph of same patient showing intertrochanteric fracture of left hip. C. Postoperative AP and lateral radiograph of the same patient treated by a long proximal femoral nail.

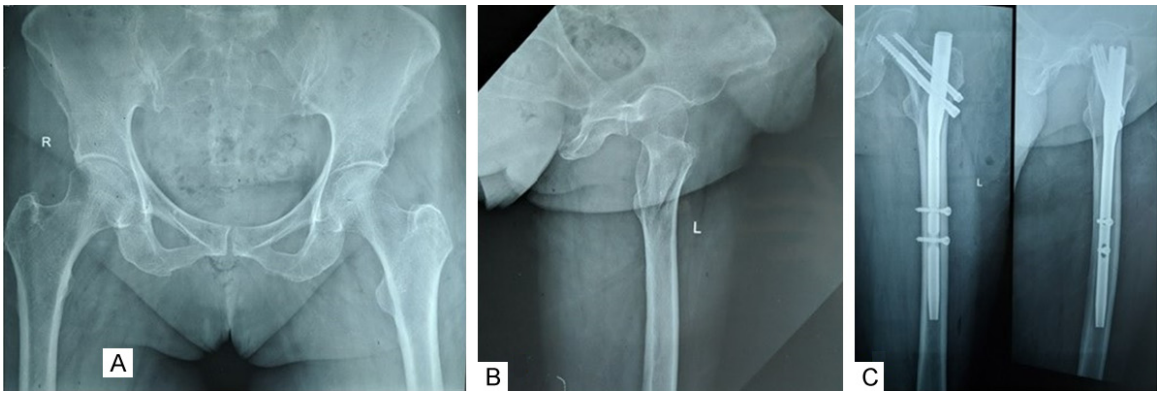

Figure 2. A. Preoperative Anteroposterior (AP) radiograph of an adult patient showing intertrochanteric fracture of left hip. B. Preoperative lateral radiograph of same patient showing intertrochanteric fracture of left hip. C. Postoperative AP and lateral radiograph of the same patient treated by a short proximal femoral nail.

Femoral Nail) group and 15 patients in the long PFN group. Patients who met inclusion criteria were randomized into groups A (short PFN) and B (long PFN). Patients were assigned to either group A or group B using a computer-based table of random numbers, wherein the sequence of implant to be used was decided and a slot was booked whenever a case of intertrochanteric fracture got admitted. All study participants were thoroughly examined both clinically and radiologically as per the predetermined protocol. To analyze the fracture pattern according to the AO/OTA classification of intertrochanteric fracture, a pre-operative x-ray of the pelvis with both hips antero-posterior and a lateral view of the afflicted hip was taken. All relevant investigations were done for pre anaesthetic check-up in order to prepare the patient for surgery.

Surgical intervention and implant used

All patients received injectable third-generation cephalosporin antibiotics 30 minutes before surgical incision. Patients were given spinal or epidural anaesthesia as per the discretion of anaesthetists and transferred with a supine posture on a radiolucent fracture table. Traction was applied to the operating limb. Closed or open reduction was followed by internal fixation with either a short or long PFN. **Figures 1** and **2** are representing the fixation of intertrochanteric fractures with long PFN and short PFN respectively.

Postoperative protocol & outcome evaluation

All patients were given intravenous antibiotics 12 hourly (cefoperazone + sulbactam 1.5 gm

and amikacin 500 mg) for at least 48 hours postoperatively following which they were shifted to oral antibiotics. Patients were allowed to sit up in bed on the second post-operative day and static quadriceps exercises were started along with knee and ankle physiotherapy. Non weight bearing walk started on second post-operative day with axillary crutches or walker. First wound inspection was done on 3rd post operative day. Patient were discharged after first satisfactory wound inspections and reviewed on 14th day post op for suture removal. Weight bearing was commenced depending upon the stability of the fracture and adequacy of fixation and it was delayed for patients with osteoporotic bones. All the patients were followed up at every 6 weeks till union of fracture then 3 monthly with check X-rays to assess fracture union and complication. The relevant indicators used in this study to compare the efficacy can be categorized as 1) Patient data which includes preoperative parameters such as age distribution, sex distribution, limb side distribution, mode of injury, fracture pattern, duration between injury and procedure; 2) Intraoperative data in which the duration of surgery and estimated blood loss was compared; 3) Post operative outcome which was evaluated by duration of hospital stay, time to union and Harris hip score.

The Harris hip score was used for functional outcome assessment wherein a questionnaire of 10 basic components was filled [namely: 1) Pain; 2) Range of motion; 3) Limp; 4) Support; 5) Gait distance; 6) Stair climbing; 7) Ease of using footwear; 8) Sitting; 9) Public transport use; 10) Deformity] and scores were allotted for each of them against a total score of 100. At each follow-up the AP and lateral view radiographs were checked to see the presence or absence of either of the following: Union, non-union, mal-union, Z effect, Reverse Z effect, implant breakage, peri-prosthetic fracture, varus collapse (change in neck shaft angle of >5 degree), screw cut-out and symptomatic back out of the screw.

Statistical analysis

The presentation of the categorical variables was done in the form of number and percentage (%). On the other hand, the quantitative data were presented as the mean ± standard deviation and as median with 25th and 75th percentiles (interquartile range). The data normality was checked by using Kolmogorov-Smirnov test. The cases in which the data was not normal, we used non parametric tests.

The following statistical tests were applied for the results: 1. The comparison of the variables which were quantitative and not normally distributed in nature were analyzed using Mann-Whitney Test; 2. Independent t test was used for comparison of normally distributed data between two groups.

The data entry was done in the Microsoft EXCEL spreadsheet and the final analysis was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, version 21.0.

For statistical significance, *P* value of less than 0.05 was considered the threshold.

Result

Study population and demographic characteristics

Mean age of patients in the group A was 62.1 ± 15.77 years, and in group B 54.1 ± 10.8 years. The majority of patients in the group A ranged between 61 to 80 years, while those in group B were of 41 to 60 years of age. A total of 11 females were operated out of which 6 were included in group A and 5 in group B. Out of the 19 males, 10 were included in group B and 9 in group A. In the study, the male-female ratio was 1.7:1. Left sided trochanteric fracture was seen in 9 patients in the group A and 7 in group B. While 6 patients in group A and 8 in group B had fracture in the right hip. The most common mode of injury in both groups was a trivial fall, which accounted for 70% of all cases. In the study, 12 (80%) patients in the group A and 9 (60%) patients in the group B sustained injury due to a trivial fall. Road traffic accident was the mode in 2 patients in group A and 6 in group B. Only 1 patient in the study sustained injury following a fall from height and was included in group A. The most common fracture pattern encountered in the study was the A031A2 type. There were 4 patients with A1 type in each of the groups. The more complex A3 pattern was seen in 5 patients out of which

Table 1. Preoperative patient characteristics in short and long PFN groups

Patient variable	Short PFN group	Long PFN group
Age		
Average (years)	62.1 ± 15.77	54.1 ± 10.8
Range (years)	35-88	38-70
Sex		
Male	9	10
Female	6	5
Mode of injury		
FFH	1	0
RTA	2	6
Trivial fall	12	9
AO/OTA classification		
AO31A1	4	4
AO31A2	10	7
AO31A3	1	4
Duration from injury to procedure (days)		
<5	2	8
5-10	7	4
11-15	4	3
>15	2	0

Table 2. Intraoperative assessment in short and long PFN groups

Variable	Short PFN group	Long PFN group	*P*-value
Duration of procedure (minutes)			
Average	68.6 ± 6.62	78.6 ± 7.35	0.0005
Range	56-82	66-89	
Estimated blood loss (ml)			
Average	92 ± 58.5	123.6 ± 19.2	0.053
Range	20-220	90-160	

4 were included in group B and 1 in group A (**Table 1**). The mean time from injury to operation in the group A was 9.6 ± 4.45 days, and 6 ± 4.12 days in the group B (0.03356 *P* value). In the study, the duration of the surgery was recorded from time of skin incision to skin closure. Which in group A was 68.6 ± 6.62 minutes, while it was significantly longer (78.6 ± 7.35 minutes) in group B (*P* value is 0.0005*). Almost all were operated in <80 minutes in group A (**Table 2**). The volume of blood collected in the suction device was added with 50 ml per mop used to compute the estimated blood loss. It was 92 ± 58.5 ml in the group A, and 123.6 ± 19.2 ml in the group B (*P* value is 0.05315). Open reduction results in a higher volume of loss, and it was required in four patients in the short PFN group and one patient in the long PFN group. In the group A, the average duration of hospital stay was 10.6 ± 5.15 days while in the group B it was 7.8 ± 3.75 days (0.099* *P* value). In our study, union was seen in a total of 26 patients, with 13 patients (86.7%) in each of the long and short PFN groups. The mean union time in group A was 15.69 ± 2.72 weeks, and it was 15.77 ± 2.05 weeks in group B (*P*-value 0.9332*) (**Table 3**).

Functional outcomes

The Harris Hip Scoring System was used to evaluate the functional outcome between the two groups at the last follow-up which was almost similar and statistically insignificant. In the group A, the mean Harris hip score was 81 ± 11.62 while in the group B it was 80.3 ± 10.83 (*P*-value 0.8657*) (independent t test). A good to excellent score of >80 was seen in 19 patients. Poor scores were noted in 2 patients in either group (**Table 4**).

Complications

There was 1 case in the short PFN group for which revision procedure was done with PFNA2 and 1 case of implant failure in long PFN group in a 55 y/m which was revised with a dynamic condylar screw (**Figure 6**). One case of screw back out in short PFN group led to a varus collapse and the pt had to be reoperated (**Figure 5**). One case of non-union was reported in long PFN group. Two cases of superficial wound infection were reported 1 in either group which healed with systemic antibiotics and didn't require further debridement. Three patients reported anterior thigh pain in the short PFN group. No mortality, screw cut through, reverse Z effect, deep infection were recorded in either group (**Table 3**).

Table 3. Complications and postoperative assessment in short and long PFN groups

Parameters	Short PFN group	Long PFN group	*P*-value
Duration of hospital stay (days)			
Average	10.6 ± 5.15	7.8 ± 3.75	0.099
Range	4-20	2-14	
Time to union (weeks)			
Average	15.69 ± 2.72	15.77 ± 2.05	0.93
Range	11-20	12-19	
Complications			
Screw cut out	0	0	
Superficial wound infection	1	1	
Anterior thigh pain	3	0	
Screw back out	1	0	
Varus collapse	1	0	
Nonunion	0	1	
Implant failure	1	1	

Table 4. Harris hip score as indicator of functional outcome in short and long PFN groups

Harris hip score	Short PFN group	Long PFN group	*P*-value
Average	81 ± 11.62	80.3 ± 10.83	0.86
90-100 (Excellent)	2	3	
80-99 (Good)	8	6	
70-79 (Fair)	3	4	
<70 (Poor)	2	2	

Discussion

This study was aimed at comparing the results of managing intertrochanteric fractures with short PFN and long PFN to know the optimum length of nail to be used. In our study we prospectively evaluated 30 patients of intertrochanteric fractures who were managed by either a short or a long PFN after alloting them to either groups after randomisation with the help of computer based random number tables and then compared various parameters and outcomes with other similar studies.

This study had a considerably smaller sample size than other studies because only 15 patients were included in each group, and it was a prospective comparative study. Furthermore, during our study period, COVID restrictions limited the number of cases performed. Studies with large sample sizes, such as those conducted by Parmar and Kleweno, were largely retrospective cohort studies in which patient data was retrieved from various hospital records [6, 7].

When it comes to intertrochanteric fractures, the literature shows that the elderly population is particularly affected. In our study, the average age of the patients in our study was 58.06 years. Patients in the Short PFN group ranged in age from 35 to 88 years old, with a mean of 62.1 ± 15.77 years, and those in the Long PFN group ranged in age from 38 to 70 years old, with a mean of 54.1 ± 10.8 years (*P* value 0.1162*) (*Independent t test).

In a study conducted by Guo, the mean age in the short nail group was 82.7 years, whereas the mean age in the long nail group was 78.9 years [8]. As a result, mean ages were not comparable with our study, which could be attributable to differences in the life expectancy of the population studied.

Most studies' sex distributions show that more females than males sustained intertrochanteric fractures, which can be explained by females' higher incidence of osteoporosis at advanced ages. There were 20 males in the long nail group and 46 in the short nail group in the study conducted by Zhi Li, whereas there were 39 females in the long nail group and 51 in the short nail group, indicating a clear female preponderance [9]. However, in this study, there were 19 men and 11 females, with a male-to-female ratio of 1.7:1. In the Short PFN group, 6 (40.0%) of the patients were female and 9 (60.0%) were male, whereas in the Long PFN group, 5 (33.3%) of the patients were female and 10 (66.7%) were males, indicating a male preponderance. This could be due to differences in population demography, with our sample's study population being younger and more active.

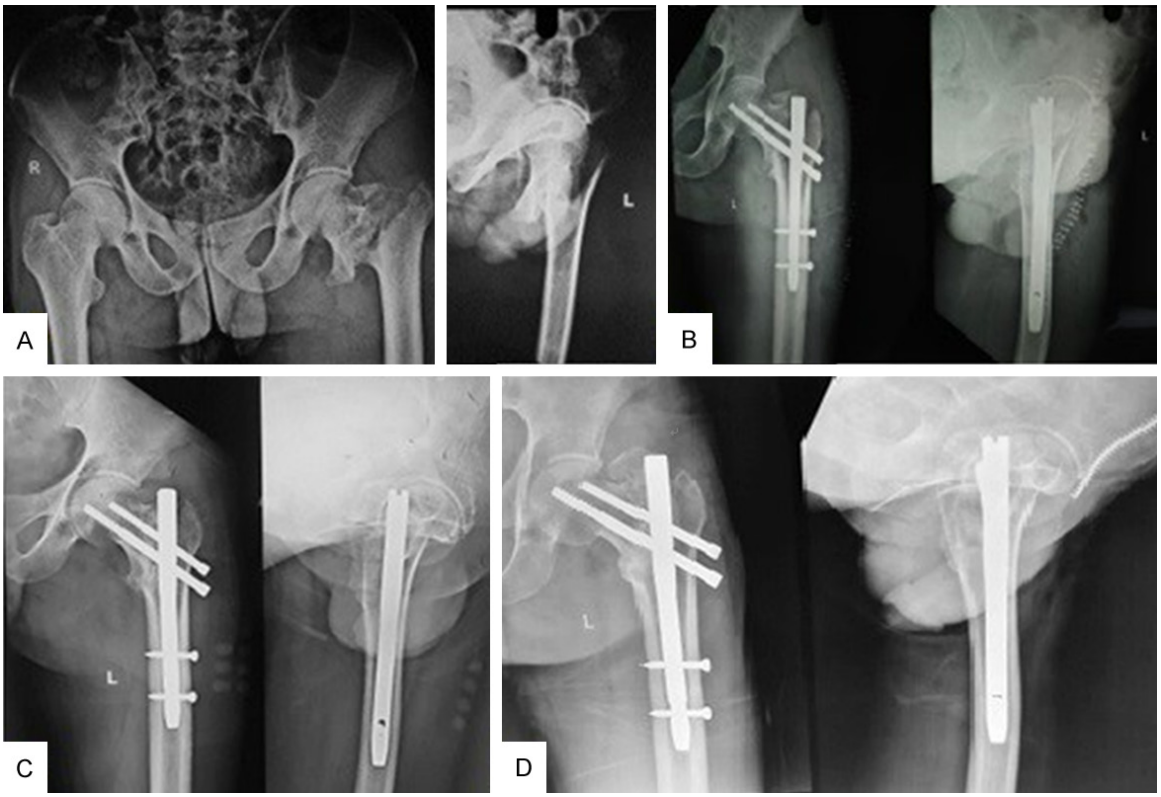

Figure 3. A. Pre-operative AP and lateral radiographs of left hip of a 35 y/m showing intertrochanteric # left femur (A031A1.2). B. Immediate post-operative radiograph showing fixation with short PFN. C. At 14 weeks follow-up radiograph of same patient showing union of fracture with maintained reduction. D. Final follow up radiograph at 12 months.

Duration of surgery

Because the short PFN did not require complete reaming of the medullary canal prior to nail insertion, it resulted in a shortened operational time. Furthermore, zig could be used to perform distal locking. The insertion of a long nail, on the other hand, necessitated full length serial reaming of the intramedullary canal while taking care not to perforate the anterior cortex due to a mismatch between the curvature of the nail and the anterior bowing of the femur, which can result from a mismatch between the curvature of the nail and the anterior bowing of the femur. Furthermore, distal locking in the long PFN required the use of image assistance to ensure that the drill was aimed correctly. In a study conducted by Boone [10], the average operating time for long (56.8 ± 19.4 minutes) intramedullary nail fixation was shown to be significantly longer (*P* value 0.001) than for short nail (44.0 ± 10.7 minutes). In a similar study, Guo [8] found that the short nail group had a significantly shorter operating time (43.5 min ± 12.3 min) than the long nail group (58.5 min ± 20.3 min) (*P* value 0.002).

In our study, the short PFN group's mean surgical time was significantly shorter than the long PFN group's. The average operative time in the Short PFN group was 68.6 ± 6.62 minutes (range 56-82 minutes), while the Long PFN group took 78.6 ± 7.355 minutes (range 66-89 min) (0.0005 *P*-value).

Functional outcomes

The functional outcome was assessed using the Harris hip score at each follow-up after radiological union, with the score at the final followup being evaluated. The harris hip scores were comparable and good in both groups, indicating that there is no evident functional advantage to utilising one over the other. HHS was 81 ± 11.62 in the short PFN group, ranging from 46 to 91, and 80.3 ± 10.83 in the long PFN group, ranging from 51 to 93 (*P* value is 0.8657*) (*Independent t test). Both long and short PFNs have excellent outcomes and can

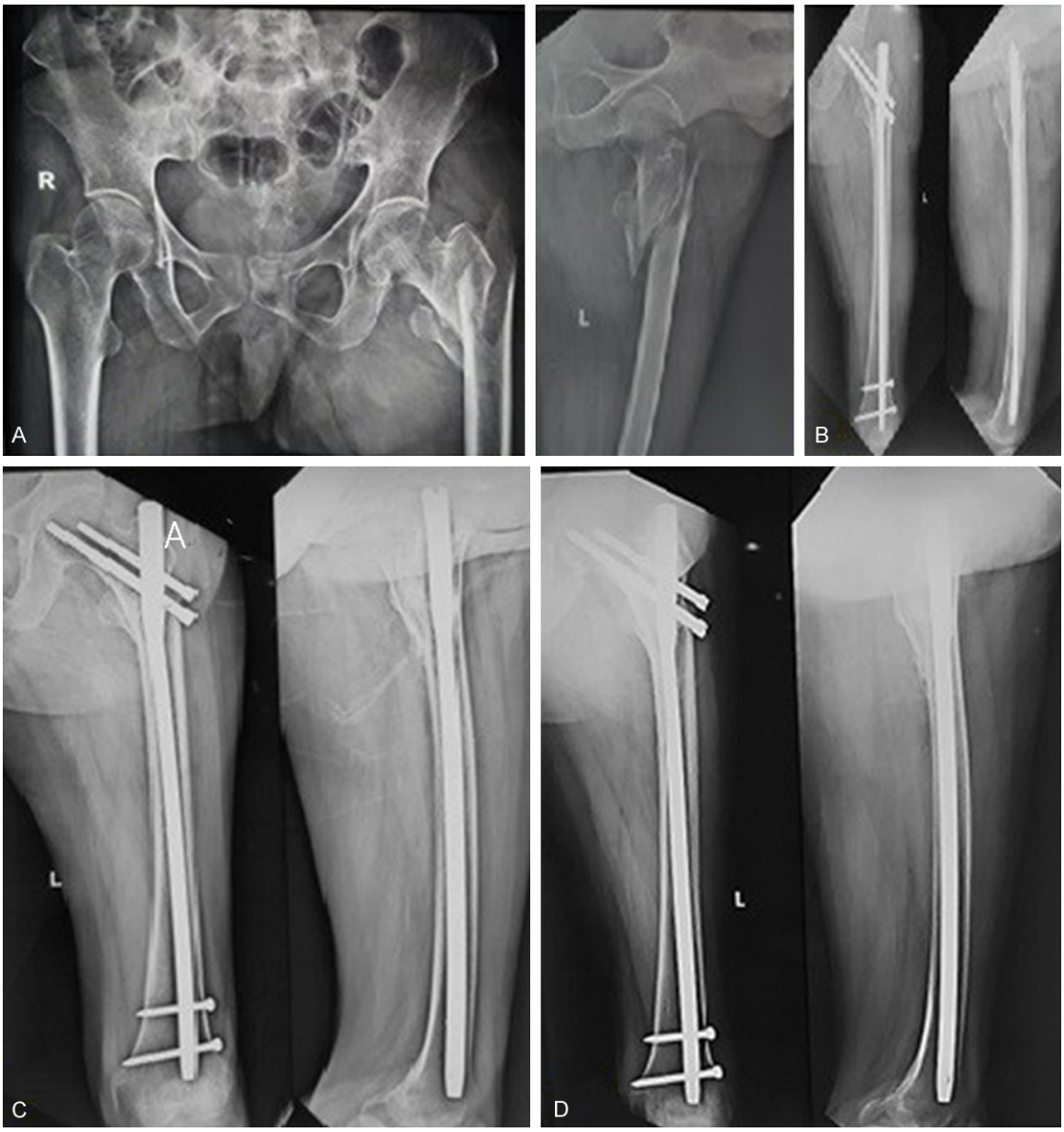

Figure 4. A. Pre-operative AP and lateral radiographs of a 52 y/F showing intertrochanteric # right femur (A031A2.2). B. Immediate post-operative radiograph showing fixation with long PFN. C. At 15 weeks follow-up radiograph showing union of fracture with maintained reduction. D. Final follow up radiograph at 12 months.

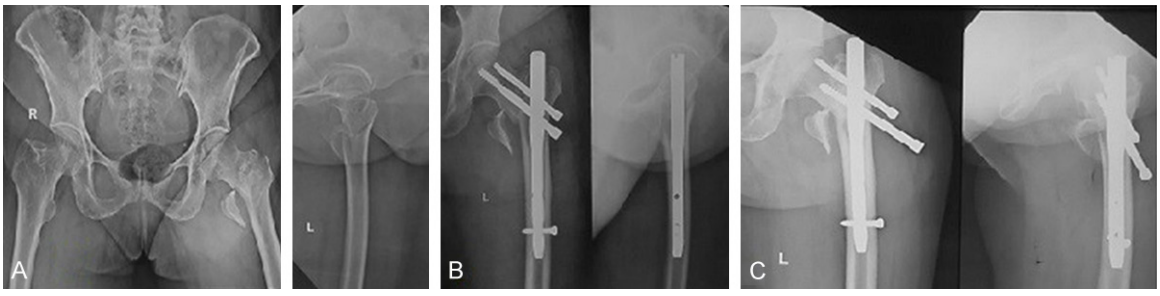

Figure 5. A. Pre operative radiograph AP and lateral view of a 60 y/f showing A031A1.3 type of intertrochanteric fracture Lt. femur. B. Immediate post operative radiograph showing fixation with Short PFN. C. 5th week follow up radiograph showing lag screw back out leading to varus collapse.

Figure 6. A. Pre operative AP and lateral radiograph of a 55 y/m showing AO31A3.3 reverse oblique comminuted intertrochanteric fracture of right hip. B. Immediate post operative radiograph showing fixation with long PFN. C. 8th week follow up radiograph showing implant failure with breakage at fracture site and breakage of anti rotation screw. D. Post operative radiograph after implant removal and revision surgery with DCS.

be used interchangeably to treat intertrochanteric fractures. Other research have found results similar to this one. At the final follow-up, Ocku found an average harris hip score of 74 in the short PFNA group and 79 in the long PFNA group [11]. Zhi Li found a similar result in their research (79.98 in short nail group and 76.16 in the long nail group) [9]. Both studies came to the same conclusion: neither implant has a significantly superior functional outcome than the other.

Radiological outcomes

Simpler fractures are usually better fixed with a sound anatomical reduction, and they tend to unite faster as a result. In comparison to the elderly female population with osteoporosis and poorer pre-injury mobility, the union can be noticed earlier in younger and active individuals. In this study, union was seen in a total of 26 patients, with 13 patients (86.7%) in each of the long and short PFN groups. In both groups, the average union time was nearly identical. It was 15.69 ± 2.72 weeks in the short PFN group, spanning from 11 to 20 weeks, and 15.77 ± 2.05 weeks in the long PFN group, ranging from 12 to 19 weeks (The *P*-value is 0.9332*) (independent t test). The majority of patients in the short PFN group 6 (46.2%) exhibited fracture union between 10 and 14 weeks after surgery (**Figure 3**), while the majority of patients in the long PFN group 9 (69.2%) showed fracture union between 15 and 18 weeks after surgery (**Figure 4**). In their study, Zhi Li found no statistically significant difference in union time between the two groups [9]. In their study, Mahesh found that the short nail group had a faster time to union, whereas

Shyam Kumar found that the long nail group had a faster mean union time [12, 13].

Complications

Implant failure was defined in this study as either a periprosthetic fracture or a hardware breakage that necessitated a revision treatment. In the long PFN group, one case of implant failure in a 55 y/m patient was revised with a DCS, and one case in the short PFN group was revised with PFNA2. One case of screw back out in the short PFN group resulted in a varus collapse, necessitating reoperation. In the long PFN group, one case of non-union was reported. There were two incidences of superficial wound infection, one in each group, that were treated with systemic antibiotics and did not require additional debridement. In the short PFN group, three individuals reported anterior thigh pain. Parmar [6] in their study found that Z effect and reverse Z effect were found more in Short PFN group (2 and 3) than in Long PFN group (0 and 1). Femoral shaft fractures, distal to the tip or around the distal part of nail, were encountered only in Short PFN group. More number of implant removals, due to anterior thigh pain and revision surgeries for non-union, were needed in short PFN group (10/52) than in Long PFN group (03/72). It was concluded that complications of Short PFN like thigh pain and femoral shaft fracture distal to the nail tips are mostly prevented by the use of Long PFN. In the study done by Kleweno, the overall incidence of periprosthetic fracture was 2% (11/559) [7]. Short nail group had rate of 2.7% (6/219) vs. 1.5% (5/340) in longer nail group. It was concluded that while using contemporary cephalomedullary implants, short and long nails exhibit similar treatment failure rates. Okcu conducted a pilot prospective randomized controlled trial comparing standard versus long nails for reverse obliquity fractures of the proximal femur [11]. There were no differences in reoperation rates between both groups. Two patients (both from the long-nail group) underwent revision surgery because of implant failure in one and deep infection in the other. There was no difference between the standard and long nail groups in mortality rate (17% versus 18%), blade cut-out (zero versus one). Josh Vaughn conducted a similar study comparing short and long nails [14]. There was 3.33% secondary fracture rate in short nail group compared to none in long nail group (P=0.054). He concluded that there was an increased risk of secondary femur fracture with short CMNs. In the retrospective study of Zhi Li, long nail group had less failure rate (0/59) than short nail group (3/97) and hence they concluded that longer nail could avoid the re-fracture of femur and also had reduced postoperative hip pain [9]. Guo conducted a retrospective study of 178 cases [8]. In each group there was 1 case of periprosthetic fracture. Nicholas B. Frisch compared patients who underwent treatment with short or long cephalomedullary nails [15]. The long nail group had a trend towards more screw cutouts (long nail, 5.2% vs. short nail, 0.0%; P=0.134) but fewer periprosthetic femur fractures (short nail, 8.3% vs. long nail, 0.0%; P=0.013). The study found a similar overall rate of orthopedic complications between short and long nails.

Conclusion

The Proximal femur nail can be used as an efficient implant to manage pertrochanteric fractures regardless of the length of the implant. Both the short as well as long nails provide an excellent outcome and neither of them have a significant advantage over the other in terms of estimated blood loss, fracture union, complication and reoperation rate, hospital stay and Harris hip score. It is imperative that in practice the ideal treatment is tailored individually according to the patient characteristics. In younger male patients, a short PFN can be used for its advantages, while in frail and elderly its more advisable to use a full length PFN to avoid stress risers. However, the mean operative time was found to be lower when a short nail is used. Furthermore, more RCTs are required to be done in future for establishing the better treatment option in managing intertrochanteric fractures. A larger sample size and a longer follow-up period are needed to determine long-term consequences such as avascular necrosis of the femoral head, which could lead to changes in the score.

Disclosure of conflict of interest

None.

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