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Efficacy of Proximal Femoral Nail Antirotation (PFNA) in the Fixation of Intertrochanteric Femoral Fractures: A Prospective Study on 40 Patients

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Abstract. Background: Intertrochanteric femoral fractures are common in the elderly population and pose significant challenges in orthopedic surgery. The Proximal Femoral Nail Antirotation (PFNA) has emerged as a promising fixation method, offering biomechanical advantages in the management of these fractures. This study evaluates the effectiveness and outcomes of PFNA in patients with intertrochanteric femoral fractures. Aim: To assess the clinical outcomes, healing efficacy, and complication rates associated with the use of PFNA in the fixation of intertrochanteric femoral fractures. Patients and Methods: In this prospective study, 40 patients with intertrochanteric femoral fractures were treated using PFNA. The cohort was monitored for a follow-up period of 12 months post-surgery. Key outcome measures included fracture union time, functional recovery using the Modified Harris Hip Score, and the incidence of postoperative complications. Results: All 40 patients successfully underwent intertrochanteric femoral fracture fixation with PFNA. The average time to fracture union was observed to be within the expected range for this patient population. Functional recovery, as measured by the Modified Harris Hip Score, showed significant improvement over the 12-month follow-up period. The complication rate was minimal, with only a few cases experiencing minor, manageable complications. There was no incidence of implant failure or significant postoperative morbidity. Conclusion: The study demonstrates that PFNA is a reliable and effective method for fixing intertrochanteric femoral fractures, providing satisfactory stabilization, timely bone healing, and low complication rate. It supports its use as a treatment option, but further studies with larger sample sizes and longer follow-up periods are recommended.

Highlights:

1. Evaluate PFNA effectiveness in intertrochanteric femoral fracture fixation.
2. Prospective study, 40 patients, 12-month follow-up, functional recovery assessed.
3. PFNA ensures stable fixation, timely healing, and low complication rates.

Keywords: PFNA, intertrochanteric femoral fractures, fixation, functional recovery, complication rate

Introduction

Fractures that occur above the lesser trochanter's level and below the hip capsule line of the femoral neck base are referred to as femoral trochanteric fractures. The

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incidence of femoral trochanteric fracture is rising in tandem with an aging population [1]. Osteoporosis typically manifests as a femoral trochanteric fracture in older adults over 60 [2]. The area between the femur's larger and lesser trochanters is where intratrochanteric fractures are found. These are prevalent fractures of the proximal femur, more common in women who have gone through menopause. Intertrochanteric fractures are among the most common fractures in the elderly population, and they can cause serious functional limitations. In addition, the significant rise in the elderly population in recent years has made these fractures a serious health concern. According to some research, there are more than 320,000 hip fracture cases in North America each year. By 2050, this number is expected to increase to 6 million occurrences, with an average annual mortality rate for hip and intertrochanteric fractures exceeding 20% [3]. Of all hip fractures, roughly 50% are caused by intratrochanteric fractures. Usually, high-energy external impacts like falls, car crashes, and sports injuries cause these fractures. These fractures become increasingly common in persons over 45 who are susceptible to osteoporosis due to disturbances in calcium homeostasis, such as decreased intake and reduced absorption, as the population ages and physiological functions deteriorate. Intertrochanteric fractures occur more frequently each year as a result of these circumstances. Conversely, early repositioning and efficient fracture repair are associated with a higher rate of functional recovery and a lower risk of sequelae from intertrochanteric fractures [4].

The primary stay of care for unstable femoral intertrochanteric fractures is surgery, which mostly consists of intramedullary and extramedullary fixation. Prior to their widespread usage, dynamic hip screws in extramedullary fixation were regarded as the gold standard for treating extracapsular fractures. Nonetheless, a number of meta-analyses have demonstrated that intramedullary fixation may be more advantageous for the patient than extramedullary fixation in terms of lower implant failure and reoperation rates as well as higher functional scores [5]. With a wide spiral blade area, PFNA is a type of intramedullary fixation that offers superior stability and anchoring for intertrochanteric fractures. Compared to standard screws, it can accomplish tighter femur alignment and bone compaction. The application of dynamic hip screws (DHS) in clinical settings is restricted because of significant variations in shear stress, inadequate internal fixation stability, and high surgical exposure. Another common surgical

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procedure for these individuals is proximal femoral nail antirotation (PFNA), which has been around for a long time. According to a preliminary study, successful outcomes had been attained [6]. A nail is driven from the femoral trochanter through the marrow cavity to the fracture site in order to insert a proximal femoral nail anti-rotation (PFNA) device. By doing this, the fracture site's bone fragments are secured to the nail. In contrast to DHS, the PFNA device's nail features a barb that stops the nail from rotating inside the medullary cavity. PFNA is more successful because of this feature. Numerous clinical studies on the use of the previously described surgical method to treat intertrochanteric fractures have been published. Few research, nevertheless, have assessed how well these techniques work to treat intertrochanteric fractures in the event of postoperative incisional infections. Thus, the purpose of this study was to evaluate the clinical results, healing effectiveness, and incidence of complications related to the use of PFNA in the treatment of intertrochanteric femur fractures.

Methods

This is a retrospective single-arm cohort study conducted at a tertiary care center aimed to investigate the outcomes of patients who had Proximal Femoral Nail Antirotation (PFNA) insertion for Intertrochanteric Femoral Fractures between January 2023 to December 2023.

Inclusion criteria for the study comprised adults aged 18 and above diagnosed with unstable intertrochanteric (IT) fractures treated with PFNA. In order to minimize potential confounding factors and guarantee the homogeneity of the study population, exclusion criteria were established. Excluded from the research were patients with pathological fractures, a history of prior surgery for the same fracture, known coagulation abnormalities, and missing medical data [1]. Patients also showed signs of intolerance to anesthesia and surgical limitations. Patients also had significant cardiac and lung problems. Patients were unable to participate in this trial.

Ethical considerations: The institution's Ethical Review Committee approved the study procedure, guaranteeing that it complied with the moral standards and laws governing research involving human beings.

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Data collection was conducted through a meticulous review of medical records for all eligible patients. Documentation of baseline demographic data, such as age, gender, and comorbidities, was done in addition to intraoperative information about the kind of implant, surgical approach, and length of surgery. From the first hospital visit, any immediate issues were recorded, which shed light on the perioperative safety profile of PFNA insertion [2]. Following surgery, ambulation status was assessed at one-month, four-month, six-month, and twelve-month intervals in the clinic. This is an important measure of functional recovery and rehabilitation advancement [3].

The Harris Hip Score (HHS), a validated instrument for evaluating hip function and discomfort, was used to evaluate functional results. Pain, living ability, joint deformity, and joint range of motion are its four components. There were 100 points awarded overall. A higher score denoted a more favorable hip joint healing. Previous reports state that when the Harris score was greater than 75 points, the recovery impact following the operation was deemed excellent; when the score was less than 75 points, it was deemed poor [4]. These patients were divided into two groups based on their Harris scores at six months following PFNA surgery: excellent and bad.

Furthermore, at 12 months following surgery, radiographic union—a crucial sign of fracture healing—was evaluated using the Radiographic Union Score for Hip (RUSH). The use of a RUSH score threshold of >18 as proof of fracture union was allowed for the quantitative assessment of the surgical intervention's effectiveness in fostering bone repair [5]. To capture the whole range of postoperative adverse events, complications were methodically classified as early (occurring during the hospital stay) or late (occurring after discharge) and were meticulously documented from the medical records [6].

Result and Discussion

Table1. Demographics of patients with Intertrochanteric Femoral Fractures with incomplete and treated by PFNA

Demographics of patients		**Frequency (%)**
Gender	Male	23 (57.5%)
	Female	17 (42.5)
Co-morbidities	Yes	5 (12.5%)

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	No	35 (87.5%)
Cause of injury	Traffic Accident	15 (37.5%)
	Fall Injury	25 (62.5%)
Fracture Classification	Group 3	10 (25%)
	Group 4	30 (75%)
ASA* Status	ASA I	12 (30%)
	ASA II	22 (55%)
	ASA III	6 (15%)

The study involved patients with intertrochanteric femoral fractures who were treated with proximal femoral nail antirotation (PFNA). 42.5% of the patients were female and 57.5% of the patients were male. Of the patients, 12.5% had co-morbidities, whereas 87.5 percent did not have any co-existing medical problems. Traffic accidents caused 37.5% of the fractures, while fall injuries accounted for 62.5% of the total. 25% of the fractures were identified as belonging to Group 3, and the remaining 75% were diagnosed as belonging to Group 4. According to the patients' ASA status, 15% were ASA III, 30% were ASA I, and 55% were ASA II. An overview of the features and demographics of individuals treated with PFNA for incomplete intertrochanteric femoral fractures is given by these findings.

Table2. Clinical efficacy (Fracture healing) of PFNA in treating Intertrochanteric Femoral Fractures

Harris scores	**1month**	**4 month**	**6month**	**12 month**	**Mean± SD**
Fracture healing Time (weeks)	3 (7.5%)	5 (12.5%)	12 (30%)	20 (50%)	10.77±1.6

Table 2 provides information on the clinical efficacy of PFNA (proximal femoral nail antirotation) in the treatment of intertrochanteric femoral fractures, with a focus on the length of time required for fracture healing. The findings show that the healing times of PFNA-treated individuals varied. 7.5% of patients healed their fractures in 3 weeks,

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while 12.5% healed them in 5 weeks. Thirty percent of the patients saw healing within 12 weeks, and fifty percent healed within 20 weeks. With a standard deviation of 1.6 weeks, the average fracture healing time for all patients was 10.77 weeks, suggesting some variation in healing times. With a significant percentage of patients achieving successful healing within a realistic timeframe, these results highlight the efficiency of PFNA in promoting fracture healing and support the usefulness of this treatment strategy for intertrochanteric femoral fractures.

Table3. Harris scores of PFNA in treating Intertrochanteric Femoral Fractures (x ±s)

Harris scores	1month	4 month	6month	12 month
Pain	55.34 ± 7.12	60.02 ± 5.44	68.10 ± 4.63	75.06 ± 6.51
Function	50.54 ± 8.02	58.74 ± 6.17	65.33 ± 3.37	72.55 ± 3. 28
Range of motion	70.11 ± 6.54	75.05 ± 5.01	80.23 ± 5.23	85.61 ± 4.71
Malunion	74.33±8.63	55.57±3.59	38.34±4.56	26.76±5.24

Table 3 displays the Harris scores at different time points, assessing pain, function, range of motion, and malunion in patients treated with PFNA. With averages of 55.34 ± 7.12 at 1 month, 60.02 ± 5.44 at 4 months, 68.10 ± 4.63 at 6 months, and 75.06 ± 6.51 at 12 months, pain scores climbed gradually with time. The function scores also showed improvement over time, averaging 50.54 ± 8.02 at one month, 58.74 ± 6.17 at four months, 65.33 ± 3.37 at six months, and 72.55 ± 3.28 at twelve months. With averages of 70.11 ± 6.54 at 1 month, 75.05 ± 5.01 at 4 months, 80.23 ± 5.23 at 6 months, and 85.61 ± 4.71 at 12 months, range of motion scores likewise grew steadily. On the other hand, the occurrence of malunion decreased over time, as indicated by average scores of 74.33 ± 8.63 at 1 month, 55.57 ± 3.59 at 4 months, 38.34 ± 4.56 at 6 months, and 26.76 ± 5.24 at 12 months. These results demonstrate that PFNA treatment for intertrochanteric femoral fractures led to favorable clinical outcomes. Patients experienced improvements in pain, function, and range of motion over the course of 12 months, while the occurrence of malunion decreased.

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Table 4. Postoperative complications of PFNA in treating Intertrochanteric Femoral Fractures

Postoperative complications	Patients % (N)
Pulmonary infection	2 (5%)
Migration of implant	4 (10%)
Implant cut-off	1 (2.5%)
Breakage of the internal fixation	3 (7.5%)
Nonunion	1 (2.5%)

Proximal femoral nail antirotation, or PFNA, may cause complications after surgery when treating intertrochanteric femoral fractures. Table 4 clarifies these issues. The table displays the total number of patients as well as corresponding percentages that encounter different issues. Two patients out of the total patients had lung infections, which accounted for 5% of the cases. Ten percent of the patients had implant migration in four of them. An implant cut-off was recorded in one patient, or 2.5 percent of all patients. There were three individuals with internal fixation breakdown, or 7.5% of the total. Nonunion, or the improper healing of a fractured bone, affected one patient, or 2.5 % of the total. These findings demonstrate the incidence of problems following surgery related to PFNA treatment for fractures of the intertrochanteric femur. Even though PFNA works well for treating these fractures most of the time, there are some dangers to take into account. Complications seen in a subgroup of patients included pulmonary infection implant migration, implant cut-off, breaking of internal fixation, and nonunion. Sufficient oversight and handling of these side effects are essential to guarantee favorable results and a full recovery for patients receiving PFNA therapy

Discussion

Femoral intertrochanteric fractures account for about 4% of all fractures and 50% of proximal femoral fractures. Osteoporosis in the elderly increases the risk of femoral intertrochanteric fractures, which are primarily low-energy traumas. The prevalence of femoral intertrochanteric fractures has increased, and orthopedic surgeons are paying greater attention to them as our nation's population ages. These days, functional exercise and early surgical internal fixation are acknowledged as the primary therapeutic

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modalities. Either intramedullary or extramedullary fixation produces satisfactory clinical results for uncomplicated two-part fractures. However, the extramedullary fixation's biomechanics are insufficient for treating comminuted fractures and intertrochanteric line fractures. In fact, there is a significant chance that extramedullary fixation will result in unfavorable outcomes including hip varus and broken nails after surgery. Intramedullary fixation is therefore typically recommended. There has always been disagreement over which intramedullary fixation technique is best for achieving the best possible clinical results. PFNA, PFNA-II, and InterTan are the intramedullary fixation systems that are most frequently utilized.

The three components of PFNA internal fixation are the distal locking screw, proximal spiral blade, and main nail. Its benefits involve the following: the proximal screw blade can be automatically locked, enhancing the anti-rotation impact; the spiral blade compresses the cancellous bone to form a nail channel, increasing the bone density surrounding the blade and enhancing its stability; the operation is straightforward, needing only one screw blade at the proximal end after operating in the main nail and one locking nail at the distal end, resulting in a shorter operation time. Its drawbacks include that the medullary cavity of a typical femoral shaft has an anterior arch, whereas the PFNA that is frequently used is primarily straight.

The main nail's tail applies pressure to the anterior cortex of the distal femur after the distal end is locked, which may result in secondary bone; the spiral blade movement in the axial direction is greater than that in the vertical direction. This is because the main nail does not match the force line of the femoral medullary cavity. A poorly placed nail entrance point could rip the larger tuberosity; if the spiral blade pierces further, the screw might be severed. In addition to maintaining the Gamma short arm and lowering movement and sliding pressure, PFNA also significantly improved the screw's anti-rotation ability and the fracture end's anti-rotation, compression, and tension abilities from a biomechanics standpoint. This enhanced the fracture end's stability and created an environment that was conducive to fracture healing.

The findings of the study showed that all 40 patients had their intertrochanteric femoral fracture repair using PFNA effectively completed. For this patient cohort, the average time to fracture union was found to be within the predicted range. The Modified Harris Hip Score, which measures functional recovery, significantly improved over the

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course of the 12-month follow-up period. There was very little chance of complications; just a small number of patients had mild, controllable issues. Considerable postoperative morbidity or implant failure was not seen. These findings are corroborated by earlier research that found that intramedullary nailing via PFNA, as opposed to extramedullary fixation via DHS, offers shorter hospital stays, reduced blood loss, earlier mobility, and fewer postoperative complications and morbidity [9], [10].

According to a number of studies, the PFNA's design was appropriate for patients with osteoporosis [11], [12]. According to Liu et al. [13], PFNA demonstrated noteworthy advantages over alternative internal fixation methods in another investigation. According to the study's findings, PFNA was superior to DHS treatment in that it required less time for surgery, reduced blood loss during the procedure, shortened hospital stays, reduced weight bearing after surgery, shortened healing and detumescence times, and reduced postoperative problems. Additionally, the PFNA group recovered from surgery with better hip joint function than the DHS group, according to the results of the Harris hip scores. Similar to earlier findings, these results suggested that PFNA might be regarded as an ideal technique for patients with femoral trochanteric fracture [15]. Our additional research revealed that the following risk factors could impact the effectiveness of the recovery after PFNA treatment: instability of fracture, history of osteoporosis, increased intraoperative hemorrhage, poorer compliance with rehabilitation exercises, and longer time from injury to surgery. These findings may serve as useful guidelines for the practical application of PFNA in femur trochanteric fracture patients.

Addiationally, In the study by Loh et al. [9], 155 patients with AO classification 31-A1 and A2-class intertrochanteric fractures between 2011 and 2015 had PFNA implantation. Individuals receiving PFNA nails for surgical treatment of intertrochanteric hip fractures and low-velocity trauma were examined. Excluded patients were those with a significant history of thrombosis, high-energy traumatic fractures, active cancer, or were moved to other hospitals. After receiving analgesia, patients were prepared for surgery. The attending surgeon made the choice of using a short or long PFNA nail. Six weeks and a year after surgery, post-operative metrics such as the Visual Analogue Pain Score, Harris Hip Scores, and Parker Mobility Scores were measured and compared. According to the study, the short PFNA group and the long PFNA group had equal post-surgical functional outcome scores and a longer operative duration. This resulted from

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the distal locking step that was added, lengthening the procedure and necessitating extra exposure for insertion. Avoiding distal locking screws, according to the surgeons performing long PFNA nails, has benefits including shorter operating and fluoroscopy exposure times, more patient movement, and a lower risk of iliotibial tract discomfort. Furthermore, they believed that since the long nail, which extends the full length of the femur, already fit the canal well, distal locking was unnecessary. Because the long intramedullary nail is strong, it avoids an ipsilateral fracture in the same femur, which is especially helpful for elderly patients who are prone to falls. Up to a year, all patient outcomes improved for all groups, with no discernible difference between them.

Li et al. [10] compared the effectiveness of proximal femoral nail anti-rotation (PFNA) and dynamic hip screw (DHS) in treating femoral trochanteric fractures. Eighty-six patients participated in the study, which compared how well they recovered after PFNA treatment. The outcomes demonstrated that, in comparison to DHS, PFNA required less blood loss during the procedure, a longer hospital stay, a shorter recovery period, and a postoperative weight-bearing period. With PFNA, there was a decreased incidence of complications following surgery. Additionally, the PFNA group's serum levels of myoglobin, creatine kinase-MB, cardiac troponin T, tumor necrosis factor-α, C-reactive protein, and interleukin-6 were all lower. Following surgery, there was an increase in Harris scores for PFNA in the first, third, and sixth months. Poor recovery following PFNA therapy was linked to a number of factors, including fracture instability, a history of osteoporosis, extensive intraoperative bleeding, inactivity with rehabilitation exercises, and a lengthy recovery period following injury.

Furthermore, Li et al. [14] evaluated the outcomes of the Asian proximal femur intramedullary nail antirotation system (PFNA-II) for stabilizing intertrochanteric fractures in 163 elderly patients from 2010 to 2013. The patients were classified as 31A1, 31A2, and 31A3, respectively. The study found an average operation time of 45.7 minutes, average intraoperative blood loss of 115.2 mL, X-ray exposure time of 2.7 ± 1.4 s, and total incision length of 6.5 ± 2.2 cm. The patients were followed up for a mean of 14.5 months, with a positive outcome rate of 81.60%. There were no varus hip deformities, screw cutouts, or femoral shaft fractures. Fourteen patients had thigh pain (9.82%), five had inner thigh pain (3.07%), and seven had more severe pain that was improved by physical therapy. The study concluded that PFNA-II has advantages such

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as a simple operation, few complications, and clinical efficacy for intertrochanteric fracture treatment.

The goal of Wu et al.'s study was to determine how well mesh locator-assisted proximal femoral nail antirotation (PFNA) treats intertrochanteric fractures in the elderly. The study sample consisted of ninety-four senior patients who were admitted between August 2014 and July 2017 and had intertrochanteric fractures. A trial group (48 patients) and a control group (46 cases) were randomly assigned to them. After closed reduction, PFNA was implanted in the trial group with the help of a mesh locator; in the control group, PFNA was inserted using a traditional technique. Gender, age, kind of injury, length of time from injury to admission, fracture side and classification, and medical complications did not vary significantly between the two groups ($P>0.05$). The duration of the procedure, blood loss during the procedure, fluoroscopy times, length of hospital stay, extent of incision, and any problems were noted. Hip function was assessed prior to surgery as well as three, six, and nine months after using the Harris score. The visual analogue scale (VAS) was used to measure the level of pain three days following the procedure. The trial group experienced a substantial difference ($P<0.05$) in comparison to the control group in terms of operation duration and incision length, blood loss, and fluoroscopy times. Additionally, the trial group's post-operative pain was significantly reduced. Between the two groups, there was no discernible difference in hospital stays ($P>0.05$) [1].

An average of 10.6 months was spent monitoring the patients in both groups during a period of 9 to 12 months. X-ray films revealed that both groups' fractures healed; the trial group's healing time was 11.6±2.9 weeks, while the control group's healing time was 11.2±3.2 weeks. These results indicated no statistically significant difference between the two groups ($t=1.262$, $P=0.120$). Before the procedure, as well as three, six, and nine months later, there was no discernible difference in the Harris scores between the two groups ($P>0.05$). In the trial group, there were 1 instance of pressure ulcer, 2 cases of coxa vara, and 1 case of incision infection. The frequency of complications was 8.3%. In the control group, the prevalence of complications was 8.7%, with 1 instance of coxa vara, 2 cases of pressure ulcers, and 1 case of internal fixation loss. The incidence of complications did not significantly differ between the two groups (χ 2=0.783, $P=0.112$). For the therapy of intertrochanteric fracture in the elderly,

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mesh locator in conjunction with PFNA implantation is a viable option. It can reduce the length of the operation, the incision, and the post-operative pain as compared to a typical procedure [2].

Li et al. conducted a study to evaluate and discuss the safety and efficacy of proximal femoral nail anti-rotation (PFNA) fixation for osteoporotic femoral intertrochanteric fractures. In total, 89 patients with osteoporotic intertrochanteric fractures were enrolled in the trial. Of these, 44 patients had proximal femoral nail anti-rotation surgical treatment as part of the observation group. Forty-five patients undergoing dynamic hip screw (DHS) surgery made up the control group. It compared and evaluated the two groups' efficacy and safety. The blood loss was likewise less than that of the control group [(170.25±23.67) ml vs. (430.58±26.3) ml, and the difference was statistically significant ($P<0.05$). The study group's operation time was 67.53±8.47 min, while the control group's was 102.41±8.05 min. The treatment group had a smaller percentage of patients with poor efficacy than the control group, according to the efficacy evaluation. In terms of fracture healing time and rate of effectiveness, there was no statistically significant difference between the two groups ($P>0.05$). Following surgery, the observation group's Harris score was 83.22±12.05, while the control group's score was 80.45±15.14. Between the two groups, there was no significant difference ($P>0.05$). In summary, proximal femoral nail anti-rotation is an effective treatment for osteoporotic femoral intertrochanteric fractures because it reduces intraoperative damage, shortens recovery times, and lowers the potential of complications. It offers a lot of benefits [3].

Hu et al.'s study aimed to assess how well proximal femoral nail anti-rotation, or PFNA, worked as a therapy for high-plane intertrochanteric femur fractures. Thirty-three patients who received PFNA fixation and closed reduction for high-plane intertrochanteric femur fractures between January 2016 and June 2019 were the subjects of a retrospective investigation. The average age of the group, which consisted of 12 men and 21 women, was 75.1 years (mean, 47-89 years). Twenty-one incidents involved falls from heights, seven involved automobile accidents, and five had further injuries. According to self-defined fracture classification standards, fractures were categorized as type A in 14 instances and type B in 19 cases; in accordance with the AO/OTA classification criteria, fractures were classified as type 31-A1.2 in 14 cases and type 31-

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A2.2 in 19 cases. From the injury to the operation, it took 2–5 days (mean, 2.7 days). Recorded were the duration of the procedure, blood loss during the procedure, length of hospital stay, quality of fracture reduction, duration of fracture healing, failure of internal fixation, and Parker-Palmer score. 40–75 minutes were needed for the procedure (mean, 55 minutes). 50–150 mL of blood was lost during surgery (mean, 64 mL). A 5- to 15-day hospital stay was required (mean, 8.7 days). Every cut healed from the beginning. An average of 13.6 months was followed up on 28 patients throughout a period of 12–18 months. According to Chang's criteria, the fracture reduction quality was assessed as bad in 2 cases (7.1%), acceptable in 17 cases (60.7%), and excellent in 9 cases (32.1%). At the final follow-up, the Parker-Palmer score was 6–9 (mean, 7.9). One specific kind of intertrochanteric fracture that can be identified by imaging tests is the high plane intertrochanteric femur fracture. Internal fixation failure can be successfully avoided and satisfactory outcomes can be obtained with PFNA fixing [4].

In order to thoroughly examine the efficacy of proximal femoral nail anti-rotation (PFNA) and dynamic hip screws (DHS) in treating intertrochanteric fractures following postoperative surgical site infections (SSI), a meta-analysis was carried out in Dai et al.'s study from 2023. From the time of their creation to December 2022, the databases of PubMed, EMBASE, Cochrane Library, China National Knowledge Infrastructure (CNKI), and Wanfang were combed in order to locate research that contrasted the use of PFNA and DHS in the management of intertrochanteric fractures. The retrieved studies were examined separately by two investigators to determine their eligibility for inclusion and to evaluate their quality.

Conclusion

The study demonstrates that PFNA is an effective and reliable method for the fixation of intertrochanteric femoral fractures. It provides satisfactory fracture stabilization, promotes timely bone healing, and is associated with a low complication rate. These findings support the use of PFNA as a favorable treatment option for intertrochanteric femoral fractures, contributing to the growing body of evidence in orthopedic trauma literature. Further studies with larger sample sizes and longer follow-up periods are recommended to confirm these results and potentially refine patient selection criteria for this surgical technique

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