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Outcome of PFN Proximal Femoral Nail in Type I & II Intertrochanteric Fractures of Femur

Md. Amanath Ullah[1*], Md. Masud Rana[2], Sheikh Anisur Rahman[3], Asiful Haque[4]

[1]Associate Professor, HOD Department of Orthopaedics, Dr Sirajul Islam Medical College & Hospital, Dhaka, Bangladesh
[2]Associate Professor, Department of Orthopaedics, Enam Medical College & Hospital, Dhaka, Bangladesh
[3]Senior Consultant, Department of Orthopaedics, Upazila Health Complex, Kapasia, Gazipur, Bangladesh
[4]Associate Professor and Head, Department of Physical Medicine and Rehabilitation, Dr Sirajul Islam Medical College & Hospital, Dhaka, Bangladesh

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***Corresponding author:** Md. Amanath Ullah
Associate Professor, HOD Department of Orthopaedics, Dr Sirajul Islam Medical College & Hospital, Dhaka, Bangladesh

Abstract **Original Research Article**

***Background*:** Intertrochanteric fractures are normal in the act of muscular health. The objective of the executives in patients with intertrochanteric fractures is to accomplish early activation. As a result of its high resilience and low difficulty rate, proximal femoral nailing (PFN) is acquiring prevalence. The motivation behind this study was to decide the useful result of patients with intertrochanteric fractures treated with PFN. ***Aim and objectives*:** The objectives are as per the following: (1) To decide the useful result of patients treated with PFN for intertrochanteric breaks. (2) To recognize entanglements in PFN patients. ***Materials and Methods*:** A total 98 patients with intertrochanteric fractures who matched the inclusion and exclusion criteria for this prospective analysis were enrolled. From January 2018 to December 2022, the study was carried out in the orthopaedics division of Dr. Sirajul Islam Medical College & Hospital in Dhaka, Bangladesh. Under spinal anesthesia, closed reduction and internal fixation are carried out. Open reduction was employed when closed reduction was impractical. Functional outcome was evaluated using the Harris hip score. That hospital's statistical study was finished, and P0.05 was deemed statistically significant. ***Results*:** Out of 98 cases contemplated, 57 (58.16%) were males and 41 (41.84%) were females was collected at the emergency hospital. The most well-known kind of Fracture was Kyle's type I , which was seen in 32 patients (32.65%), trailed by Kyle's type II in 43 (44.89%) patients, while fair and unfortunate results were found in 14 (14.28%) and 6 patients, separately. Extremely unfortunate result was found in 3 (3.06%) patients. ***Conclusion*:** PFN is an incredible procedure for treating intertrochanteric cracks. It is related with a great result in most of cases and negligible difficulties.

Keywords: Functional outcome, Harris hip score, intertrochanteric fractures, proximal femoral nailing.

INTRODUCTION

One of the most typical conditions requiring an orthopedic consultation is an intertrochanteric femoral fracture [1]. These fractures can happen from even modest trauma and are more common in the elderly. Intertrochanteric fractures are more common as the older population rises as a result of better medical treatment and longer life expectancies. Even though it is well known that these fractures heal on their own, there is a very high and unacceptable incidence of malunion and varus deformity, which leads to limping [2]. Intertrochanteric fractures cannot be managed conservatively due to the unacceptably high risk of deformity; hence, surgical treatments are required in almost all instances. These fractures are also linked to additional problems including osteoporosis and protracted incumbency because they are more common in the elderly [3].

Intertrochanteric fractures are usually brought on by high energy trauma, such as falls from great heights, collisions at high speeds, or vehicle accidents. However, in elderly individuals with osteoporotic bones, a low energy trauma, such as a simple fall, may also bring on an intertrochanteric fracture [4]. Female patients over 60 years old had a higher overall incidence of these fractures than younger individuals [5]. Men are disproportionately affected when these fractures strike young people (often as a result of high intensity trauma). Patients typically arrive with fractures following either little trauma, such as a simple fall in elderly patients, or high energy trauma, which is found in young people [6]. There is a considerable

possibility that secondary injuries, such as multiple fractures, brain traumas, or abdominal trauma, will also coexist in young patients with intertrochanteric fractures. Particularly in young patients with intertrochanteric fractures, it is imperative to rule out the possibility of concurrent life-threatening injuries [7].

These fractures are diagnosed using hip X-rays in the anteroposterior and cross-table lateral views. The availability and affordability of computed tomography are still limited, especially in poor nations, despite the fact that it helps in surgical procedure planning and properly describing the fracture and its extent [8]. Once an intertrochanteric fracture has been identified, surgical procedures such as screw-plate fixation, dynamic hip screws, and proximal femoral nails (PFN) may be used as part of the treatment. The ultimate goal of treatment is permanent fixation as well as early mobilization of the patients because these fractures are often observed in elderly patients with co-morbid systemic disorders including diabetes, hypertension, or chronic obstructive pulmonary disease. The prolonged immobility of these individuals may lead to life-threatening consequences such pneumonia, sepsis, and thromboembolic events [9].

The PFN is a relatively new operation that has been demonstrated to have a number of advantages, including less blood loss after surgery, quicker recovery times, faster mobilization, and shorter hospital stays on average. A lower incidence of sequelae such deep vein thrombosis, bed sores, and nosocomial infections is also associated with early mobilization [10].

This investigation was done to look at the functional results of intertrochanteric fractures treated with PFN.

Aims and Objectives

1) To determine the functional outcome of patients treated with PFN for intertrochanteric fractures.
2) To identify complications in PFN patients.

MATERIALS AND METHODS

From January 2018 to December 2022, the study was carried out in the orthopaedics division of Dr. Sirajul Islam Medical College & Hospital in Dhaka, Bangladesh. Patients with intertrochanteric fractures were treated with PFN. 98 patients were included in this study based on previously established inclusion and exclusion criteria.

Age, gender, and place of residence were among the demographic details that were sought and recorded. A thorough history was obtained in each patient, including information about the injury's source, mechanism, and length of recovery. For young patients, whose high energy trauma is more likely to be the cause, a thorough history and clinical examination were conducted to rule out the likelihood of polytrauma and many fractures. The diagnosis of an intertrochanteric fracture was made using X-rays of the anteroposterior and cross-table lateral views of both hips. In addition, X-rays were checked for osteoporosis, which is one of the most typical causes of intertrochanteric fractures in elderly people following minor trauma. The Kyle's type I classification are used to categorize of – I, II, III and IV types.

Criteria for inclusion

The study's inclusion criteria were as follows:

- Individuals with Kyle's types I and II who had intertrochanteric femur fractures
- Written informed consent was given by the patients.
- Be older than 18.

Criteria for exclusion

People were disqualified from the study based on the following criteria:

- Those who objected.
- Younger than 18 years of age.
- Patients who have had polytrauma and numerous fractures.
- Patients with severe co-morbid disorders, such as neoplastic diseases or stroke, are more likely to have their functional result evaluated negatively.

Patients with rheumatoid arthritis, psoriatic arthritis, or any other type of arthritis who are likely to have a detrimental effect on functional evaluation throughout follow-up.

The examination of the age appropriation of the concentrated on cases uncovered that the best number of patients (6 cases) were between the ages of 19 and 70. Male patients had a mean time of (44.5%) years, while female patients had a mean period of (59.6%) years. At the point when male and female patients' age bunches were looked at, male patients were viewed as bound to have intertrochanteric breaks at a more youthful age than female patients. The age appropriation contrast among male and female patients was viewed as genuinely critical (P=0.0001) (Table 1).

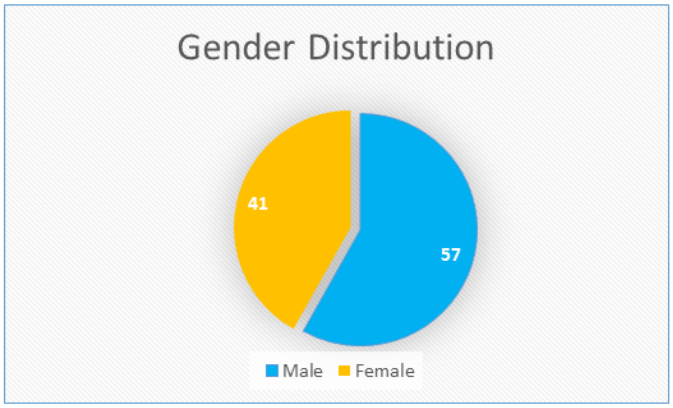

Figure 1: Portrays the orientation appropriation of the cases contemplated

Table 1: Age distribution of the studied cases

Age	**Female No**	**Percentage**	**Male No**	**Percentage**
19 - 20	4	6.68	2	3.34
21 - 30	8	13.36	5	8.35
31 - 40	12	20.04	12	20.04
41 - 50	9	15.3	6	10.02
51 - 60	8	13.36	5	8.35
61 - 66	11	18.37	9	15.03
67 - 70+	5	8.35	2	3.34
Total	57	95.19	41	68.35
Mean Age 44.10 + 15.35 Female Age 59.60 + 11.71				
P Value P= 0.0001 (Significant)				

The most widely recognized reason for crack in this study was street car crashes (72 cases), trailed by falls (26 cases). The right half of the femur was impacted in most of patients (56 cases), trailed by the left side (42 cases) (Table 2).

Table 2: Motive of injury and affected side in studied cases

Type	**No of cases**	**Percentage**
Motive of Injury		
Road or Traffic accident	**72**	**73.46**
Fall from height	**26**	**26.53**
Total	**98**	**100**
Affected side		
Right	**56**	**57.14**
Left	**42**	**42.85**
Total	**98**	**100**

As per the Kyle's grouping of intertrochanteric femoral breaks, the most well-known sort of crack was Kyle's type I , which was seen in 32 (32.65%) patients, trailed by Kyle's type II which were found in 43 patients.

Shut decrease and PFN were acted in 76 (77.55%) of the cases, while open decrease was expected in 22 (22.44%). Most of cases 75(76.53%) had a medical procedure for an hour and a half, while 23 (23.46%) had a medical procedure for over an hour and a half. The typical length of medical procedure was found to be 52.56 minutes (Table 3 and Figure 3).

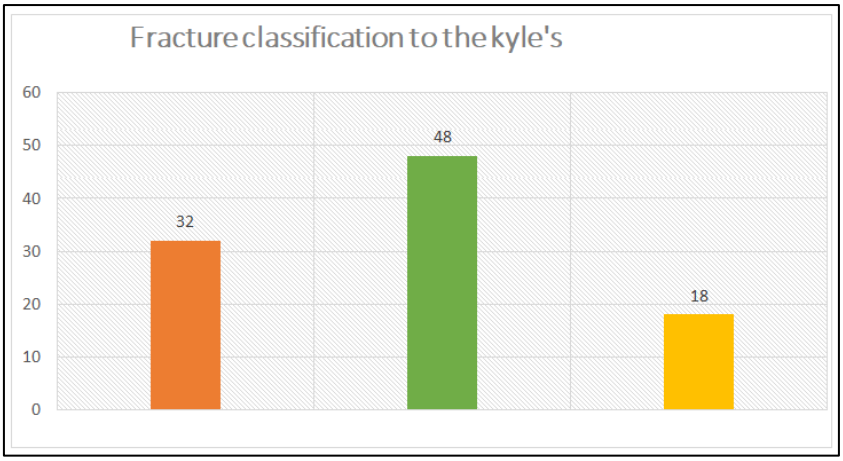

Figure 2: Break grouping as per the Kyle's

Table 3: Type of reduction and duration of surgery in studied cases

Type	**No of cases**	**Percentage**
Open Versus Closed Reduction		
Open Reduction	**22**	**22.44**
Closed Reduction	**76**	**77.55**
Total	**98**	**100**
Duration of Surgery		
<90 min	**75**	**76.53**
90 - 120 min	**23**	**23.46**
Total	**98**	**100**

Figure 3: Intertrochanteric fracture of the femur with more noteworthy trochanter comminution (left), post-usable X-beam after proximal femoral nail obsession

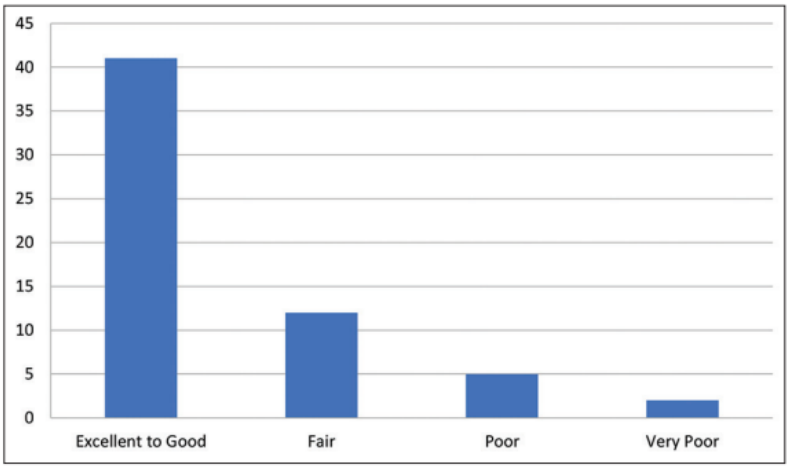

Figure 4: Functional outcomes in the cases studied

According to the analysis of instances based on complications, there weren't any issues in 80% of the cases. Infection at the local surgical site occurred in 6 (6.12%) of the patients. Numerous reductions (5%), shortening of the afflicted limb (3.33%), malunion (1.67%), and non-union (1.67%) were also problems.

DISCUSSION

Early movement is one of the typical criteria of treatment intertrochanteric fractures in order to prevent consequences from extended immobility, especially in senior patients who are more susceptible to acquiring such issues. In order to effectively manage these patients, it is crucial to quickly restore optimal functionality. Dynamic hip screws (DHS) were frequently used to treat intertrochanteric fractures, although they have been linked to higher blood loss, longer recovery times, and varus collapse. PFN is being used more and more to lessen the hazards connected with DHS. Due to their intramedullary location, PFNs are anticipated to endure increased static and cyclical loads. PFN is recommended over DHS because of these advantages [11].

Our study covered 98 patients in total. The M: F ratio among the 98 patients was 1:0.62, with 57 (58.16%) men and 41 (41.84%) women. 43 patients who received PFN surgery for intertrochanteric fractures were the subject of a study by Jose *et al*., Among the 41 patients, there were 15 men and 8 women [12]. Because there were more men in this study than in ours, its findings were similar to those of ours. Although authors like Doua *et al*., [13] and Lu *et al*., [14]. The fact that the majority of patients in our study (70%) had a cause related to a traffic accident, which is more likely to happen to men than women, may account for the preponderance of men in our study.

The average age of the patients was 59.6011.71 years for women and 44.1015.34 years for men. Male patients were found to have intertrochanteric fractures more frequently than female patients in younger age groups when their age groups were compared. P=0.0001 was used to determine the statistical significance of the age distribution difference between male and female patients. In a research by Amini *et al*., intertrochanteric fractures from high energy were present in 57 patients under the age of 65 (mean age, 45 years). The authors noted that the affected cases' average age was 45 [15]. Other investigators, such Alpantaki *et al*., [16] and Gangadharan *et al*., [17] Who had more cases subsequent to fall as an etiology for intertrochanteric fractures, reported a substantially older mean age of the affected individuals. Young male patients are more prone to have an intertrochanteric fracture because high velocity trauma, such as car accidents, is the most common cause of this condition in young patients. The typical age of patients with intertrochanteric fractures brought on by minor trauma, such as a fall at home, is likely to be higher than 60 years old.

In our study, excellent to good functional outcomes were achieved by 43 (44.89%) patients, while fair or poor outcomes were achieved by 14 (14.28%) and 6 (6.12%) patients, respectively. Three patients (3.06%) had really bad outcomes. The rate of complications was modest, and most of them were treated conservatively. Similar research was done by Rathore *et al*., on 104 patients who had PFN surgery for intertrochanteric fractures [18].

Functional outcome study performed by the authors showed that 73% of patients had excellent to good outcomes. A fair outcome occurred in 18% of patients, a poor outcome in 7.7%, and a very poor outcome in 2%. As most of our patients had outstanding to good outcomes in the majority of cases, it was discovered that the functional outcome in our study was comparable to the study done by Rathore *et al*., Authors including Jonnes *et al*., [19] and Mallya *et al*., [20] Reported comparable great results after PFN.

CONCLUSION

PFN is an excellent surgical technique for treating intertrochanteric femoral fractures and is virtually always accompanied with early mobilization. The huge majority of the time, it is connected to superb functional benefits. In the vast majority of cases, PFN is not connected to any difficulties.

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