

Original Article

A COMPARATIVE STUDY OF FUNCTIONAL OUTCOMES OF FIXATION OF INTERTROCHANTERIC FRACTURES WITH DYNAMIC HIP SCREW FIXATION OR PROXIMAL FEMORAL NAILING FIXATION

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ABSTRACT

Objective: Intertrochanteric fractures are one of the most common and most devastating injuries in the elderly. With the tremendous improvements achieved in the field of medicine over the decades, life span of an individual has also increased. Treatment of intertrochanteric fracture is by both non-operative and operative methods.

Methods: This is a prospective study of 30 cases of intertrochanteric fractures treated by early surgical fixation with Dynamic hip screw fixation or proximal femoral nailing. The period of survey and follow-up extends from oct 2020 to march 2022. Harris Hip Score (HHS) was used to assess functional outcome.

Results: The mean age of the PFN group was 61.9+10.49 years, whereas the mean age of DHS group was 61.63+9.02 years. The PFN group had a higher HHS score in the current investigation and an intergroup comparison of the Harris Hip score between the PFN and DHS groups revealed significant differences at each follow-up period.

Conclusion: The PFN is a better alternative of fixation in patients with intertrochanteric femur fractures in terms of functional outcome.

Keywords Injury, Elderly, Intertrochanteric, Proximal femoral nailing, Dynamic hip screw

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INTRODUCTION

Intertrochanteric fractures are one of the most common and most devastating injuries in the elderly [1]. With the significant advancements made in the medical field over the years, the life expectancy of individuals has also risen. The occurrence of these fractures has surged considerably in recent decades and is expected to persist in the near future as the elderly demographic continues to grow [2]. These patients are limited to home ambulation and are dependent for their basic day to day activities either on a family member or a walking aid. Due to limited ambulation mortality rates are very high [3]. Due to improved treatment, early ambulation is possible and better functional outcome is achieved with reduction in the morbidity rates [4]. As life expectancy continues to rise globally, the population of elderly individuals is growing in every geographical area. It is projected that the occurrence of hip fractures will increase from 1.66 million in 1990 to 6.26 million by the year 2050. In India the incidence is also on the rise due to the extended lifespan [5]. Treatment of intertrochanteric fracture is by both non-operative and operative methods. Non-operative method includes skeletal traction and de-rotation boots. Operative methods are by dynamic hip screw, intramedullary nailing and prosthetic replacement. Two main mode of operative management are Dynamic hip screw (DHS) and intramedullary nailing mainly proximal femoral nailing (PFN). Surgical intervention offers a more favorable prognosis and decreases mortality associated with fractures. Various implant types are utilized based on the specific kind of intertrochanteric fracture. This study primarily aims to evaluate the functional outcomes of dynamic hip screws and proximal femoral nails when applied to all categories of intertrochanteric fractures.

MATERIALS AND METHODS

This prospective study involved 30 cases of intertrochanteric fractures. The duration of the study spanned from October 2020 to March 2022. Patients were informed about the study, and consent

was obtained before the commencement of the research. The cases were analyzed based on several criteria, including age distribution, sex distribution, side of injury, mode of injury, fracture classification, type of implant used, time interval between injury and surgery, associated injuries, duration from injury to hospitalization, length of postoperative stay, time to union, range of motion, postoperative complications, and rehabilitation.

Pre operative protocol

All patients received in the emergency ward were resuscitated for hypovolemia with fluids and blood. Major injuries were treated first. After the general condition of the patient is improved, x-ray pelvis anteroposterior view and the affected hip anteroposterior and lateral views were taken. Then the fracture was immobilized with skin traction. Once the patient was assessed by the anesthetist for surgery, all 4 types of intertrochanteric fractures were fixed with either dynamic compression screw fixation or proximal femoral nailing. Most of the cases were taken up for elective surgery before 4th day, few were taken after 5 days if there was any associated injuries or factors affecting the assessment for surgery.

Postoperative protocol
Dynamic hip screw

Postoperative rehabilitation was decided by the stability of the fracture. In all types of trochanteric fractures with dynamic hip screw fixation, mobilization exercises started in day one. Touch down weight bearing by 10th day. Partial weight bearing was allowed after radiological evidence of callus by 4-6 w. Full weight bearing was allowed only after radiological evidence of union.

Proximal femoral nail

In type-1 and type-2 fractures post post-operative rehabilitation was started by mobilization exercises on post-operative day one. Touch

down weight bearing was started by 6th day. Partial weight bearing was started by 2-3 w with crutches. Full weight bearing was allowed only by radiological evidence of union. In type-3 and 4 fractures, partial weight bearing was allowed by 4-5 w. Full weight bearing was allowed only after complete radiological union.

Analysis of functional outcome

It was done using harris hip score this rating system is a scoring system which includes pain, movement, function, shortening and angulation.

Data collection and analysis

Data was entered in MS Excel Sheets and was analysed using SPSS.

The quantitative variables were expressed using mean and Standard Deviation.

RESULTS

Age and sex distribution

Intertrochanteric fractures commonly occur around age of 6th decade, with mean age of 61.9+10.49 years in PFN group, while mean age was 61.63+9.02 years in DHS group. In our study majority of patients were male 60% (18) (table 1). Male to female ratio was 3:2. In our study 17(56.6%) patients had involvement of right side, of which 9 were treated with PFN, while 8 were treated with DHS. 13(43.4%) patients had involvement of left side of which 6 were treated with PFN, while 7 were treated with DHS.

Table 1: Distribution of subjects according to age

S. No.	Age group (in Years)	No. of cases	Percentage (%)
1.	40-50 Y	5	16.6
2.	51-60 Y	7	23.3
3.	61-70 Y	11	36.6
4.	71 – 80 Y	7	23.3

Table 2: Distribution of subjects on the basis of boyd and griffin classification

Type	No. of cases	Percentage
Type-1	9	30%
Type-2	13	43.3%
Type-3	6	20%
Type-4	2	6.6%

Distribution on the basis of classification of intertrochanteric fracture

Boyd and Griffin classification is most commonly used classification of intertrochanteric fractures. Most commonly, patient suffered type-2 fractures (43.3%) followed by type 1(30%), type 3(20%), type 4 (6.6%) (table 2).

Functional outcome

The functional outcome was assessed using Harris Hip Score, which were better for proximal femur nail group than dynamic hip screw. 6 mo mean HHS for proximal femur nail group was 81+7.1, while for dynamic hip screw group it was 71.46+6.3 as higher score indicates better functional ability.

Union of fracture

Union at 14 w for proximal femur nail group (78.6+14.3 %) was slightly better than dynamic hip screw group (70.67+15.6%). In this study, the PFN group experienced less blood loss, a shorter length of operation, and a smaller incision size than the DHS group. In present study, the PFN group had average operating time of 60.33+16 min, while DHS group had 93.66+22 min.

DISCUSSION

Intertrochanteric fractures have increased in recent years as life expectancy has increased. Numerous studies have compared the outcome of intertrochanteric fractures treated with a dynamic hip screw (DHS) and proximal femur nail (PFN). The purpose of this study was to compare the outcomes of dynamic hip screws and proximal femur nails and compare the procedures themselves to determine which treatment is superior in terms of patient compliance and long-term recovery. The aim of study is to evaluate the functional outcome of the fixation of intertrochanteric fractures fixed with both dynamic hip screw and proximal femoral nailing. The mean age of the PFN group was 61.9+10.49 years and in DHS group it was 61.63+9.02 years. Similar observations were noted in the study done by *Fransisco et al.* [6]. Males constituted the majority of cases in both groups in the current study, this was consistent with the findings of *Clawson et al.* [7]. Males are more susceptible to road traffic accidents, which reflects the study's predominance of males. In the current study, the

majority of 13 (43.3%) patients had type 2 fractures, while 9 (30%) had Type 1, 6 (20%) had type 3 fractures and the remaining 2 (6.6%) had Type 4 fractures. *Suranigi et al.* [8] conducted a study in which the most prevalent type of fracture was discovered to be type 2. There were no fractures with a type I pattern in their study. The PFN group had a higher HHS score in the current investigation. *Ranjeetesh et al.* [9] discovered a similar finding in their study. They examined the outcome of 50 patients who had intertrochanteric fractures treated with a Dynamic Hip Screw against a Proximal Femoral nail. The results indicated that patients treated with PFN began ambulating earlier because they had a higher Harris Hip Score.

LIMITATIONS

Limited sample size and single-centric study design were limitations of the present study.

CONCLUSION

The PFN is a better alternative of fixation in patients with intertrochanteric femur fractures in terms of functional outcome such as union of the fracture, return to functional activity, morbidity, and implant failure) and intraoperative parameters such as total duration of surgery, intraoperative blood loss.

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AUTHORS CONTRIBUTIONS

All authors have contributed equally

CONFLICT OF INTERESTS

Declared none

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