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Functional outcome trochanteric fracture treated with proximal femoral nail

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Abstract

Introduction: proximal femoral nail is widely using implant in treatment of trochanteric fracture of femur. Various study has been done of functional outcome of PFN. The aim of study to know the functional outcome of proximal femoral nailing in trochanteric fracture.

Material and Method: The study was done in rajshree medical college and hospital during period of 8 month. Fracture classification according to AO the functional outcome evaluated by the harris hip score.

Result: 40 patients of either sex with trochanteric fracture were studied up to 8 month. The largest age group of patient was 51 to 60 year. Young patient due to road traffic accident. Male are more than female. Reduction achieved in traction table by closed method in which failed open reduction done. The complication rate was around 20%. the functional outcome by Harris hip score excellent in 22 pt.

Conclusion: Proximal femoral nail is technically demanding implant. With proper method it's give excellent results.

Keywords: Proximal femoral nail, trochanteric fracture

Introduction

Proximal femoral nail are common implant used in trochanteric fracture of femur. Trochanteric fracture is one of common fracture in geriatric population. As road traffic accidents are increased day by day the trochanteric fracture common in young population [1]. In the current life style early mobilization and less surgical scar mark with less complication is the primary aim of surgical treatments. The proximal femoral nail was introduced by A.O/AISF in 1996. PFN is a load sharing implant, but after introduction of PFN various studies taken in support and against of PFN in trochanteric fractures [2]. However, till today people still prefer DHS as the gold standard in trochanteric fracture. Various studies on PFN have shown that the complication rates are higher like screw cut out proximal femoral fracture, higher re operation rates [2]. In our study we reported that adequate use of implant with good surgical understanding give a very good functional outcome in trochanteric fracture.

Material and Methods

The material for the present study was obtained from the patients admitted in Rajshree medical college and research institute, Department of Orthopaedics' with diagnosis of trochanteric fracture between 1st FED 2018 to July 2019. Consent was taken and patients know about the study, 40 cases were taken which included 23 males and 17 females with 8 month follow up with PFN fixation. All trochanteric fracture with skeletal mature patients was included in study. Fracture was classified according to the A.O system; the most common fracture types were A2, followed by A1 and A3. The reduction was achieved by closed manipulation, and traction on fracture table. The open reduction was done in which reduction not achieved in closed means fixation was done with short PFN - and long PFN. Lag screw 90-105 mm and hip pin shorter than lag screw are used, lag screw was inserted near the subchondral bone intraoperative and postoperative assessment was done. Broad spectrum antibiotics were given intravenously for first 3 days followed by oral antibiotics up to 12 days postoperative till suture removal.

Patients were allowed to stand on the bedside on the 2nd day postoperatively.

Partial weight–Bearing walking allowed in 5 days, and full weight bearing in 7 days postoperatively. On 3rd postoperative day X-ray was taken, another x-ray was taken in the 1st month then in every 2 months for radiological assessment. Functional assessment checked by Harris hip score.

Statistical analysis

SPSS version 21 was used for statistical analysis. Descriptive Statistics were used to interpret results.

Results

The study involved 40 confirmed cases of trochanteric fractures of either sex. All patients treated with proximal femoral nail. The functional analysis of the patient data, intra operative data and postoperative outcome is as follows. The age distribution was from 21 to 85 years. The average age was 52.66 years the largest group of patients being from 51 to 60. 60 patients of either sex with pair trochanteric fractures were studied with follow-up to 8 months. There were 17 females and 23 males. 32 fractures were due to domestic fall and 8 due to road traffic accidents (table-1). Most road traffic accidents patients were young and active males. According to A.O classification, 14 patients 31A1 stable, 18 patients 31A2 unstable, 8 had 31A3 unstable (table-2). The reduction was achieved as closed in 34 patients and 6 required open reduction. The average blood loss was 103 ml and six patients required blood transfusion. The average operating time was 72 minutes. 6 patients had intraoperative complications like failure in proximal screw, varus angulation, failure in distal screw, 1 patient had a fracture of lateral cortex. In delayed complications 1 patient who had hip joint stiffness were above 70 years of age, 1 patient had knee joint stiffness, 1 patient had a limb length discrepancy more than 2 cm, and 1 patient with varus angulations. Total complications were 20% (table-3). The average hospital stay was 16.80 days. The Harris hip score was excellent in 24 patients, good in 7 patients, fair in 6 patients, poor in 3 patient results according to Harris hip score (table-4)

Discussion

The successful functional outcome of trochanteric fracture depends on many factors: the age of the, the general health, type of fracture, adequacy of treatment and stability of fracture [3]. The PFN nail is shown to prevent the fracture of the trochanteric by having a small distal shaft diameter which reduces stress concentration at the tip [4]. Due to its position close to the weight bearing axis stress generated on the intramedullary implants is negligible. Buttress effect of PFN prevents the mediatisation of the shaft. The entry portal of the proximal femoral nail through the trochanteric limits the surgical insult to the tendinous hip abductor musculature only [5]. In the series 295 patients with trochanteric fracture were treated with PFN by Domingo *et al.* [6] the average age at that study was 80 year .27% of the patients developed complication in the immediate postoperative period. In that study the overall results obtained were acceptable. J Pajarinen [7] *et al.* were not able to show clear superiority of PFN in view of increased operation time. Sudan *et al.* [8] found no statistical difference between two groups PFN group and DHS. PFN has higher failure screw rates. In screw failure rates the screw placed is superior, we think that it is not due to the implant failure but due to technical failure. In our study rates of screw failure is less due to better technical

Understanding. In a study of 35 patients by Metin Uzun *et al.* [9] in 2009 long term x-ray complication was seen following treatment of trochanteric fracture with PFN which affected functional outcome in all the patients. Harris hip score was 82.1. The results were excellent in 11 patients (31.4%), good in 15 patients (42.9%), Fair in seven patients (20%), and poor in 2 patients (5.7%). In our study there was no z effect or reverse z effect, the Harris hip was superior to that study. Ballal *et al.* [10] (2008) study recorded 216 patients of PFN fixation. They reported 12 PFN failed case in various groups with broken PFNs. In our study implant was not failed and union was achieved in all 40 cases. Sung sookim *et al.* [11] (2011) compared the curative effect of Proximal femoral nail antirotatorion (PFNA) with Proximal femoral nail (PFN). They studied 58 cases treated with PFNA, and 60 cases, who were treated by PFN from July 2005 to may 2007. There was no difference in results of PFN and PFNA. Our study also support that PFN has best functional outcome and less economic issues than other implants. Hesham *et al.* [12] study involved 20 patients with trochanteric fracture fixation with proximal femoral nail. They studied both clinically and radiographically. The age group was between 20 to 70 years of age and used merle D Aubigne scoring system. They received excellent 25%, good (40%), fair (20%) and poor (15%). Our results based on Harris hip score which had good results. In our study no case reported with deep vein thrombosis. Hotz *et al.* [13] reported 37 cases of deep vein thrombosis treated with proximal femoral nail. Koyuncu *et al.* [14] in 2015 studied 152 patients of trochanteric fracture with osteosynthesis by proximal femoral nail and reported late complication in 27 patients. In our study no case reported to cutout and z effect after follow up to 6 month which is in contrast to Koyuncu *et al.* [14] Windolf *et al.* [15] reported major patients with poor outcomes. Osteosynthesis with PFN is a better method for simple trochanteric fractures with excellent bone quality; it is not advisable in fixation of complex fractures in patients with reduced bone density. In our study, reduction was a significant factor and achieved by both open and closed method.

Table 1: Types of injuries

	Number of patients	Percentage
Domestic fall	32	80
Road traffic accident	8	20

Table 2: Fracture pattern

Fracture pattern	Number of patients	Percentage
31A1-stable	14	33
31A2-unstable	18	50
31A3-unstable	8	16

Table-3: Complications

Operative complications	Number of patients	Percentage
Failure in proximal screw	6	10
Varus angulation	1	3
Failure in distal screw	2	3
Fracture of lateral / cortex	1	3
Femoral fracture	0	0
Hip joint stiffens	1	10
Knee joint stiffens	1	3
Shorting	1	3
Varus angulation	1	3
Z effect	1	3

Table 4: Harris hip score

Results	Number of patients	Percentage
Excellent	24	53
Good	7	25
Fair	6	13
Poor	3	9

Conclusion

The proximal femoral nail is technically demanding implant. With proper surgical and technique it's give best functional outcome without complication.

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