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FUNCTIONAL OUTCOME OF PROXIMAL FEMORAL NAIL IN MANAGEMENT OF INTERTROCHANTRIC FRACTURE FEMUR

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ABSTRACT

Background: The study was conducted to analyse the functional outcome of the treatment of stable and unstable Intertrochanteric fractures of femur treated with Proximal Femoral Nail . **Methods**: In this prospective study, 25 patients of both sex and aged above 18 years with intertrochanteric and subtrochanteric fractures admitted to our institution were treated with Proximal Femoral Nail were followed up over a period of 6 months. The fractures were classified as per Boyd-Griffin classifications. Clinical and radiographic analysis was done regularly till fracture union occurs. Assessment of the functional outcome was done by using Harris hip Scoring system at the end of 6 months. **Results**: Out of 25 cases, 19 were males and 6 were females, in the age group of 21-78 years with the mean age of 49.24 years. Majority (76%) of the fractures showed radiological union by 20 weeks with the mean union time of 18.52 weeks. Excellent to good results were achieved in 80% of patients as per Harris hip score. Post-operative complications like delayed/non-union were seen in two patients. No case of screw cutout or 'Z' effect were seen. **Conclusion**: we conclude that with good understanding of fracture biomechanics, accurate instrumentation and technique, proximal femoral nail (PFN) gives excellent clinical results in the management of all types of stable and unstable intertrochanteric and subtrochanteric fractures of femur.
Keywords: Intertrochanteric fracture, Subtrochanteric fracture, Proximal femoral nail, Harris hip score

1. INTRODUCTION

Proximal femoral fractures are a major cause of morbidity and mortality world over in view of huge population, high road traffic accident rate and increasing age of population1 . Although these fractures can occur in any age group, two subsets of patients are commonly observed. Either these fractures are seen in more elderly or in the younger age population. On the basis of anatomical location of fracture, proximal femoral fractures can be divided into neck of femur, intertrochanteric and subtrochanteric fractures. Each requires special methods of treatment and has their own set of complications and controversies regarding the optimal method of management2 . Owing to high complication and mortality rates associated with conservative management 3 , these fractures are now managed surgically to achieve a stable fixation which allows early mobilization of patients, thus avoiding complications of prolonged immobilization. While both extramedullary and intramedullary implants can be used to treat these fractures, intramedullary implants allow more biological fixation and are load sharing devices. Extramedullary devices are always under stress because of bending strain which is not good for fracture whereas intramedullary devices are under axial strain which cause compression and thus helpful for fracture union. Gamma nail was the earliest version of intramedullary fixation devices. Arbeitsgemeinschaft für Osteosynthesefragen (AO/ASIF) introduced the proximal femoral nail (PFN) in 1996.4 In view of these considerations, the study of surgical management of intertrochanteric and subtrochanteric fractures with Proximal femoral nail(PFN) was undertaken to analyse the functional outcome and to evaluate the complications associated with proximal femoral nailing in such types of fractures.

Material and Methods:

25 adult patients of intertrochanteric and subtrochanteric fractures of the femur admitted in our institution from July 2015 to July 2017 were prospectively analysed. The fractures were classified as per Boyd-Griffin and Russell-

Taylor classifications for intertrochanteric and subtrochanteric fractures respectively Ethical approval was taken from the Institutional ethical committee prior to the initiation of this study. Informed consent was obtained from all the patients included in the study. Inclusion criteria included all patients above 18 years of age with intertrochanteric subtrochanteric fractures. Pathological fractures, open fractures and periprosthetic fractures were excluded from the study. After admission, clinical and radiological evaluation was done and all the patients were given necessary resuscitation and were maintained on skin traction pre-operatively. X-rays in both anteroposterior and lateral views were taken preoperatively and required blood investigations were done. Patients were operated after getting anaesthetic fitness and prophylactic ceftriaxone shot was given to all the patients 30 minutes before surgery. Post-operatively foot end elevation was advised and sutures were removed usually after 10- 12 days. Patients were encouraged for quadriceps strengthening exercises and hip and knee mobilization in the immediate post-operative period as per subjective tolerance to pain. All the patients were called for follow up regularly till fracture union occurs and were analysed clinicoradiogolically. The final functional assessment was done using Harris hip scoring system at the end of 6 months.

Results: In our study we had following observations in preoperative (Table-1) and Postoperative assessment (Table2)

	Parameter	No of patients	Percentage
1	Type of fractures Intertrochanteric	25	
2	Intertrochanteric fracture (Boyd-Griffin classification) Type 1 Type 2 Type 3 Type 4	 06 10 05 04	 24 40 20 16
3	Age distribution(Years) 21-30 31-40 41-50 51-60 61-70 71-80	 05 05 03 06 03 03	 20 20 12 24 12 12
4	Sex Incidence Male Female	 15 10	 60 40
5	Side affected Right Left	 15 10	 60 40
6	Mechanism of Injury Road traffic accidents Fall from standing height/stairs etc	 14 11	 56 44
7	Associated injuries Head injury Fracture both bone leg Colle's fracture	 02 02 01	
8	Post-traumatic time lag Within 2days 3-6 days More than 6 days	 06 15 04	 24 60 16
9	Average duration of surgery(minutes) Less than 60 60-90 90-120	 05 16 04	 20 64 16

TABLE 2

SR NO	PARAMETERS	NUMBER OF PATIENTS	PERCENTAGE
1	Post-operative complications Early Superficial infection Deep infection	 02 02	 08 08
2	Late Malunion with shortening Delayed/Nonunion Knee stiffness	 03 03 01	 12 12 04
3	Radiological Union time(Weeks) Upto 16 16-20 20-24 More than 24	 03 16 04 02	 12 40 16 08
4	Harris hip score Excellent(90-100) Good(80-89) Fair(70-79) Poor(<70)	 04 16 02 03	 16 40 08 12

DISCUSSION:

Intertrochanteric of femur are devastating injuries and have been recognized as a challenge by the Orthopaedic surgeons. The intention of treating these fractures is to achieve stable surgical fixation, promote faster healing, early mobilization, & restore pre-fracture functional status. Majority (76%) of patients in our study were males. RTA was the main cause of fractures in our study. Increasing urbanization, increase in traffic, poor traffic rules, rash driving, preponderance of outdoor activities drunk driving in males explains our observations. RTA affect all age groups and all genders, however more than 83% of the victims are males.7 In Kumar M et al8 series RTA was the major cause of proximal femur fractures(86%). In series of Yadkikar SV et al9 77% of patients were in the age group of 20-60 years.In our series majority of the subtrochanteric fractures were caused by road traffic accidents in the younger age group and low energy trauma like fall from standing height/stairs was the reason for most of the intertrochanteric fractures in elderly which was further enhanced by postmenopausal osteoporotic effects on the bones. Head injury was managed conservatively. Fractures both bone leg were managed surgically before operating the indexcase. Colle's fracture and clavicle fractures were managed conservatively. We achieved 92% union rate by 24weeks with overall mean of 18.52 weeks. The mean union time was 17.6 weeks and 19.07 weeks for intertrochanteric and subtrochanteric fractures respectively. The early union of intertrochanteric fractures as compared to subtrochanteric fractures may be explained by the cancellous architecture and high vascular supply of intertrochanteric region. In Kumar M et al8 series the average union time for intertrochanteric fracture was 3.8 months (3.4-4.5months) and 4months (3.7-5.6months) in subtrochanteric fractures. The two patients with superficial infection responded well to the short course of antibiotics and sterile dressings. The patient with deep infection was treated with repeated debridement and courses of antibiotics as per culture sensitivity reports. This patient went into delayed/nonunion. Another patient who was very old and with associated medical comorbiditie did not show union by 24 weeks. Two patients with varus malunion had a shortening of 1cm. One patient developed knee stiffness due to associated osteoarthritis of knee joint. Complications like Z effect, reverse Z effect, cut-out or breakage of antirorational screw has been reported by Himanshu et al.10 We did not encounter any case of screw cut-out or 'Z' effect which compares well in studies of Kumar M et al8 and Reddy KRet al11 who reported no case of screw cut-out or 'Z' effect. Patients with associated injuries had delayed partial weight bearing. We had excellent to good results in 80% of cases with average Harris hip score of 84.3. Results of our study compares well with various studies mentioned in the literature like Gowda PR et al12 and Gulia AK13 et al10 which reported excellent to good scores in 83.33% of cases.

CONCLUSION:

We conclude that, with good understanding of fracture biomechanics, Proper preoperative planning, accurate instrumentation and surgical technique, proximal femoral nail is an excellent implant in the management of all types of stable and unstable intertrochanteric fracture patterns.

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