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Functional outcome of proximal femoral nail in the management of subtrochranteric and intertrochanteric fractures of femur

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ABSTRACT

Background: The study was conducted to analyse the functional outcome of the treatment of stable and unstable Intertrochanteric and Subtrochanteric fractures of femur treated with Proximal Femoral Nail (PFN). **Methods:** In this prospective study, 26 patients of either sex and aged above 18 years with intertrochanteric and subtrochanteric fractures admitted to our institution were treated with Proximal Femoral Nail (PFN) from July 2008 to december 2009 and were followed up over a period of 6 months. The fractures were classified as per Boyd-Griffin and Russell-Taylor 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 26 cases, 20 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 cut- out or 'Z' effect were seen. **Conclusion:** Based upon our experience and results 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

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 population[1]. 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 management[2]. 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 peri- prosthetic 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 analysedclinico- radiogolically. 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 (Table-2)

Table 1

Sr No	Parameters	Noofpatients	Percentage
1	Type of fractures		
	Intertrochanteric	10	36.0%
	Subtrochanteric	16	64.0%
2	Intertrochanteric fracture (Boyd-Griffin classification)		
	Type 1	01	11.11%
	Type2	04	44.44%
	Type3	03	22.22%
	Type4	02	22.22%
3	Subtrochanteric fractures (Russel-Taylor classification)		
	Type I	11	68.0%
	TypeII	05	32.0%
4	Age distribution		
	(Years) 21-30	06	20.0%
	31-40	03	12.0%
	41-50	05	20.0%
	51-60	05	20.0%
	61-70	04	16.0%
	71-80	03	12.0%
5	Sex Incidence		
	Male	20	76.0%
	Female	6	24.0%
6	Side affected		
	Right	15	56.0%
	Left	11	44.0%
7	Mechanism of Injury		
	Road traffic accidents	19	72.0%
	Fall from standing height/stairsetc	07	28.0%
8	Associated injuries		
	Head injury	01	4.0%
	Fracture both bone leg	02	8.0%
	Colle'sfracture	02	8.0%
9	Post-traumatic time lag		
	Within 2days	07	28.0%
	3-5days	15	56.0%
	Morethan5days	04	16.0%
10	Average duration of surgery (minutes)		
	<60	09	36.0%
	60-90	14	56.0%
	90-120	02	08.0%

Table 2

Sr.No	Parameters	No. of Patients	Percentage
1	Post-operative complications Early Superficial infection Deep infection	 02 01	 08.0% 04.0%
	Late Malunion with shortening Delayed/Nonunion Knee stiffness	 02 02 01	 08.0% 08.0% 04.0%
2	Radiological Union time(Weeks) Upto 16 16-20 20-24 More than 24	 03 17 04 02	 08.0% 68.0% 16.0% 08.0%
3	Harris hip score Excellent(90-100) Good(80-89) Fair(70-79) Poor(<70)	 06 14 04 02	 24.0% 56.0% 12.0% 08.0%

DISCUSSION

Intertrochanteric and subtrochanteric fractures of femur are devastating injuries and have been recognized as a major challenge by the Orthopaedic surgeons. The aim of treating these fractures is to achieve stable surgical fixation, promote faster healing, early mobilization, & restore pre-fracture functional status in the shortest possible time.

Majority (76%) of patients in our study were males. RTA was the main cause of fractures in our study. Increasing urbanization, rise of vehicular traffic, non-obedience of traffic rules, rash driving, preponderance of outdoor activities and rash/drunk driving in males explains our observations. Road traffic accidents affect all age groups and all genders, however more than 83% of the victims are males.[7] In Kumar M et al[8] series RTA was the major cause of proximal femur fractures(86%). In series of Yadkikar SV et al[9] 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 index case. 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 al[8] and Reddy KR et al[11] who reported no case of screw cut-out or 'Z' effect. atients 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 al[12] and Gulia AK[13] et al[10] which reported excellent to good scores in 83.33% of cases.

CONCLUSION

Based on our experience and results we conclude that with good understanding fracture biomechanics, good preoperative planning, accurate instrumentation and surgical technique, proximal femoral nail (PFN) is an excellent implant in the management of all types of stable and unstable intertrochanteric and subtrochanteric fracture patterns.

REFERENCES

1. BabhulkarS. sProximal femur fractures.Indian j Orthop.2013;47(3):322
2. Mittal R, Banerjee S-Proximal femoral fractures: Principles of management and review of literature.J Clin Orthop Trauma.2012 Jun;3(1):15-23
3. Jewett EL. One piece angle nail for trochanteric fractures. J Bone Joint Surg. 1941; 23: 803-10.
4. GadegoneWm,SalphaleYS.Proximal femoral nail-an analysis of 100cases of proximal femoral fractures with an average follow up of 1 year.IntOrthop Jun 2007;31(3):403-408
5. Boyd HB, Griffin LL. Classification and treatment of trochanteric fractures. Archives of Surgery 1949;58(6):853-66.
6. Leung KS. Subtrochanteric fractures. Rockwood & Green's textbook of fractures in adults: 6th edition: Vol. 2: 1827-44.
7. Sharma SM.Road traffic accidents in india.Int J Adv Integ Med Sci 2016;1(2):57-64
8. Kumar M, Krishna Murthy. T, Ankith. N.V, Somashekar D. A prospective study of clinicoradiological outcome assessment in proximal femoral fractures treated with proximal femoral nail. International Journal of Contemporary Medical Research 2016;3(5):1343-1346