



A Clinical study of Management of Inter-trochanteric fracture femur in terms of proximal femoral nailing in consecutive 100 patients.

KEYWORDS

Intertrochanteric Fracture, Proximal femoral nail, Harries hip score

Nayak Maunil R

Consultant orthopaedic surgeon (M.S), Mahagujarat Multispeciality Hospital, Nadiad, Gujarat

Shah Pratik D

Consultant Orthopaedic surgeon (M.S), Medistar multispeciality hospital, Himmatnagar, Gujarat.

Desai Hrishikesh V

Consultant Orthopaedic surgeon(M.S), Bhavini hospital, Vapi, Gujarat

ABSTRACT

Proximal femoral nail have been introduced relatively recently but have begun to compete the traditional DHS. The mechanical strength of the nail and less invasive procedure has made the procedure preferable. This prospective study consists of study of 100 cases of intertrochanteric fracture treated with proximal femoral nail. Radiological assessment was done with serial x-ray. Patients were clinically assessed using harris hip score. 18 patients had complications related to implant. Proximal femoral nail is an optimum implant for the internal fixation of intertrochanteric fractures, especially the unstable variety, with advantages of lesser dissection; early weight bearing and ambulation with early resumption of daily activities. Most of the cases were relatively free from long term complication. It has low pre and post op complication.

INTRODUCTION:

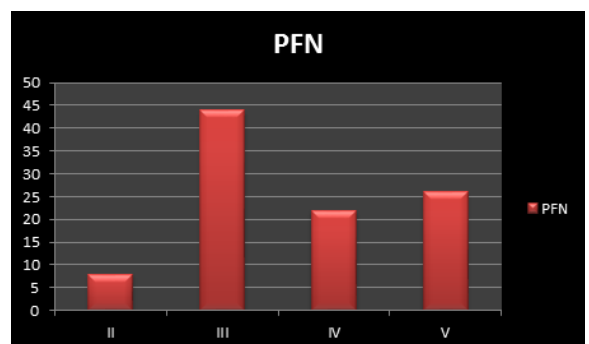
Femoral trochanteric fractures are one of the most frequently occurring fractures in the elderly, usually following trivial trauma. The tendency to fall increases with patient age and is exacerbated by several factors including poor vision, decreased muscle power, labile blood pressure, decreased reflexes, vascular diseases and coexisting muscular pathology^[1]. In the younger age group of people, in whom it is uncommon, it occurs always due to high velocity trauma. Trochanteric fractures are seen nowadays with increasing frequency and severity, as the life span of the population has increased. The morbidity and mortality both are quite high in this age group of the patients irrespective of the mode of treatment more so if ambulation is delayed.

To make the patient most comfortable and make him ambulatory in the shortest possible time, operative fixation of the fracture naturally becomes the method of choice, though it is a major procedure. The ideal internal fixation device should be such that the patient can be mobilized at the earliest without jeopardizing the reduction, stability and union of the fracture.

MATERIAL AND METHODS:

The study group consists of 100 cases of intertrochanteric fracture operated with proximal femoral nail, in which there were 52 males and 48 females. The mean duration of follow up was 10.6 months. Patient's records, radiographs and subsequent follow up of 100 patients were done at our institution from July 2009 to October 2011. All patients included in this study were classified into Tronzo's classification^[2], type-I to type-V. AP view of pelvis with both hips and lateral view of affected hip were taken. We have done analysis in the form of; the mechanism of injury, fracture patterns, difficulties encountered during treatment, complications and, final results. The operations were performed within 4 days of the trauma on a fracture table thus achieving closed adequate reduction in 98 cases. The standard PFN were implanted by using a 5-cm skin incision which extended from the cranial part to the tip of the greater trochanter. After penetrating the fascia and muscles, a 2.8 mm K-wire was inserted at the tip of the greater trochanter under fluoroscopic control in both planes. The

proximal part of the femoral shaft was reamed with a 17-mm reamer. The nail was then introduced manually into the femoral shaft. Using C-arm control the first guide wire for the neck screw was placed in the femoral neck so that the screw could be placed in the lower half of the neck on the anteroposterior view and centrally/or slightly posterior on the lateral view. Then the guide wire for the anti-rotational hip pin was introduced. The hip pin should be introduced no further than to a horizontal line through the tip of the greater trochanter. The neckscrew should be introduced afterwards. The mean duration of surgery was 53.5(30-115) minutes. We used long PFN, except 3 patients where we used short PFN because the anterior curvature of femur was more than usual.



(Chart No-1. Classification of fractures on basis of Tronzo's classification)

FOLLOW UP PROTOCOL:

Patients were assessed using Harris Hip Score^[3] at final follow up with radiographs.

REHABILITATION PROTOCOL:

Depending on the type of fracture, stability and age, assisted non weight bearing or partial weight bearing was started usually within the first week. Partial weight bearing is taught to the patient, such that about 25 % of the body weight is given on the operated limb. Simultaneously active hip and knee strengthening exercises were also started. Patients were next called after another 1 1/2 months

and reassessment, both clinical as well as radiological, was done and if union was found to be progressing satisfactorily full weight bearing was started as tolerated.

RESULTS:

In this series the commonest age group for intertrochanteric fractures is between 61 – 70 years (34%) followed by 51-60 years (23%). The youngest patient in the study, group was 17 years old and oldest 100 years. The average age was 61.29 years.

Incidence of mode of trauma due to domestic fall and vehicular accident was 76% and 24% respectively.

The most prevalent fracture type is Tronzo type III followed by Tronzo type IV.

Postoperative radiographs showed near anatomic fracture reduction in 72 patients. In these patients we achieved stable fixation due to postero-medial continuity. 84 patients show radiological union at six months. Mean duration of hospitalisation was 13.06 days. 4 patients got superficial infection, resulted in debridement and control of infection within average of 1 week.

18 patients had postoperative complications. 2 died within 4 days of surgery because of causes, unrelated to the implant. In 10 cases, a so-called Z-effect^[4] was seen. This means a movement of the hip pin towards the medial side into the hip joint with destruction of the cartilage in the joint. In 4 patients, the so-called reversed-Z-effect^[4] occurred with movement of the hip pin towards the lateral side, which required early removal of the pin.

No	Complications	Our series
1.	Z effect	10%
2.	Reverse Z effect	4%
3.	Neck screw cutout	0%
4.	Nonunion	4%
5.	Peri - implant fracture	0%

(Table No - 1. Complications of proximal femoral nail)

According to Harries hip score , 44 patient had excellent, 34 had good, 10 had fair and 12 had poor outcome.

DISCUSSION:

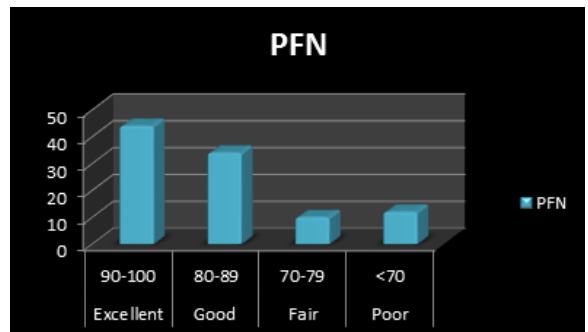
The discussion about the ideal implant for treatment of proximal femoral fractures continues. From the mechanical point of view, a combined intramedullary device inserted by means of a minimally invasive procedure seems to be better in elderly patients (Rosenblum^[5] et al. 1992, Prinz^[6] et al. 1996). Closed reduction of the fracture preserves the fracture hematoma, an essential element in the consolidation process (McKibbin^[7] 1978). Intramedullary fixation allows the surgeon to minimize soft tissue dissection thereby reducing surgical trauma, blood loss, infection, and wound complications (Leung^[8] et al. 1992, Radford^[9] et al. 1993). The Arbeitsgemein-schaft für Osteosynthesefragen (AO/ASIF) therefore developed the proximal femoral nail with an antirotational hip pin together with a smaller distal shaft diameter to avoid failures like cut-out of the implant and fracture of the shaft femur.

In an experimental study, Götze^[10] et al. (1998) compared the load ability of osteosynthesis of unstable per- and subtrochanteric fractures and found that the PFN could bear

the highest loads of all devices.

Walking capacity of 36% patients was unlimited and limited to a maximum of 1000 meters in 40% of patients. 80% of the patients used little or no support for walking. 90% of the patients in this series complained of none or only slight pain at the hip on final follow up. 18% of the patients were able to sit cross-legged and 34% were able to squat without difficulty on final follow up. Based on all the above criteria the functional result according to Harris Hip Score was found to be excellent in 44%, good in 34%, fair in 10% and poor in 12% of patients. Mean Harris Hip Score was 84.22 in our series while it was 69.5 in Porecha^[11] at al series.

HARRIS HIP SCORE



(Chart No-2. Harris Hip Score at final follow up)

In comparison to the Gamma nail, we found no fracture of the femoral shaft and no break in the implant (Bridle^[12] et al. 1991, Leung^[8] et al. 1992, Radford^[9] et al. 1993)

For more distal and uncommon trochanteric fractures, the intraoperative and fracture fixation results while the PFN were better than with sliding hip screws (Parker and Handoll^[13] 2002).. The PFN has been shown to prevent of femoral shaft fractures by having a smaller distal shaft diameter which reduces stress concentration at the tip (Simmacher^[15] et al. 1999).

In conclusion the proximal femoral nail is an optimum implant for the internal fixation of intertrochanteric fractures, especially the unstable variety, with advantages of lesser dissection, early weight bearing and ambulation with early resumption of daily activities. It is therefore concluded that the results of this new implant compare favourably to the currently available implants for the treatment of the unstable intertrochanteric femoral fracture in elderly.

REFERENCE

1. Kenneth J. Koval, Robert V. Cantu, Chapter 45-Intertrochanteric Fractures, Rockwood & Green's Fractures in Adults, 6th Edition, p-1794.
2. Tronzo RG. Special considerations in management. *OrthopClin North Am* ,1974;5:571-583.
3. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty: an end-result study using a new method of result evaluation. *J Bone Joint Surg [Am]* 1969;51-A: 737-55.
4. Boldin C, Seibert FJ, Fankhauser F, et al. 2003. The proximal femoral nail (PFN)—a minimal invasive treatment of unstable proximal femoral fractures: a prospective study of 55 patients with a follow-up of 15 months. *ActaOrthopScand* 74:53–58.
5. Rosenblum S F, Zuckerman J D, Kummer F J, Tam B S. A biomechanical evaluation of the gamma nail. *J Bone Joint Surg (Br)* 1992; 74: 352-7.
6. Prinz S, Letsch R, Büscher D. Gamma-nagel und Classic-nagel (intramedulläre Stabilisierung) versus DHS (extramedulläre Stabilisierung) bei proximalen Femur-frakturen. *HefteUnfallchir* 1996; 262: 14.
7. McKibbin B. The biology of fracture healing in long bones. *J Bone Joint Surg (Br)* 1978; 60: 150-62.
8. Leung K S, So W S, Shen W Y, Hui P W. Gamma nails and dynamic hip screws for peritrochanteric fractures. *J Bone Joint Surg (Br)* 1992; 74: 345-51.
9. Radford P J, Needoff M, Webb J K. A prospective randomised comparison of the dynamic hip screw and the gamma locking nail. *J Bone Joint Surg (Br)* 1993; 75: 789-93.
10. Götz B, Bonnaire F, Weise K, Friedl H P. Belastbarkeit von Osteosynthesen bei instabilen per- und subtrochanteren Femurfrakturen: experimentelle Untersuchungen mit PFN, Gamma-Nagel, DHS/Trochanterstabilisierungsplatte, 95°-Kondylenplatte und UFN/Spiralklinge. *Aktuelle Traumatologie* 1998; 2 8: 197-204.
11. Porecha M M, Parmar D S, Chawada H R, Parmar R D. Long proximal femoral nails versus sliding hip screw-plate device for the treatment of intertrochanteric hip fractures, A randomized prospective study in 100 elderly patients. *The Internet Journal of Orthopedic Surgery*. 2009;12:1 032-035 Volume 12 Number 1.
12. Bridle S H, Patel A D, Bircher M, Calvert P T. Fixation of intertrochanteric fractures of the femur. *J Bone Joint Surg (Br)* 1991; 73: 330-4.
13. Parker M J, Handoll H H. Gamma and other cephalocondylic intramedullary nails versus extramedullary implants for extracapsular hip fractures. *Cochrane Database Syst Rev* 2002; 1-55.
14. Guyer P, Landholt M, Keller H, Eberle C. Der Gamma-nagel bei per- und intertrochanteren Femurfrakturen: Alternative oder Ergänzung zur DHS. *Aktuelle Traumatologie* 1991; 21: 242-9.
15. Simmermacher R K J, Bosch A M, Van der Werken C. The AO/ASIF-proximal femoral nail (PFN): a new device for the treatment of unstable proximal femoral fractures. *Injury* 1999; 30: 327-32.