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Dr. VA Satre
Department of Orthopedics
KIMS, Karad, Maharashtra, India

Dr. SD Takale
Department of Orthopedics
KIMS, Karad, Maharashtra, India

Correspondence
Dr. VA Satre
Department of Orthopedics
KIMS, Karad, Maharashtra, India

To study the management of proximal femoral fractures by proximal femoral nail

VA Satre and SD Takale

Abstract
Aim: to study the management of proximal femoral fractures by proximal femoral nail.
Material and Method: This study was carried out to study the epidemiology of peritrochanteric fractures, to testify the anatomical and functional outcomes of treatment with proximal femoral nail. All these 25 patients included in the study were followed up at regular intervals. After the patient with subtrochanteric or trochanteric fracture was admitted to hospital all the necessary clinical details were recorded in proforma prepared for this study. After the completion of the hospital treatment patients were discharged and called for follow up at outpatient level at regular intervals for serial clinical and radiological evaluation. The patients were followed up till one year after surgery at regular interval and if necessary subsequent follow up was done.
Result: Average mean age is 67.84 years. In our study males are predominant contributing 17(68%) and females are 8(32%). In this study A2 type of fractures are more common contributing 68%, A1 and A3 type of fractures are 16% each. We had one patient case No.25 of 3rd, 4th and 5th rib fractures of left side which were treated conservatively.
Conclusion: though the learning curve of this procedure is steep, with proper patient selection, good instrumentation, image intensifier and surgical technique, PFN remains the implant of choice in the management of Peritrochanteric fractures.

Keywords: Proximal Femoral Fractures, Proximal Femoral Nail

Introduction
Peritrochanteric fractures are devastating injuries that most commonly affect the elderly and also in young, have a tremendous impact on both the health care system and society in general. Peritrochanteric fractures mainly comprise of fractures of trochanter and subtrochanteric region. Despite marked improvements in implant design, surgical technique and patient care, peritrochanteric fractures continues to consume a substantial proportion of our health care resources [1].
Trochanteric fractures are common in the elderly people [2]. The frequency of these fractures has increased primarily due to the increasing life span and more sedentary life style brought on by urbanization. Trochanteric fractures occur in the younger population due to high velocity trauma, whereas in the elderly population it is most often due to trivial trauma. The incidence of trochanteric fractures is more in the female population compared to the male due to osteoporosis. In a Swedish study of more than 20,000 patients, the incidence of hip fractures in women doubled every 5.6 years after the age of 30 years [3].
The trochanteric fractures can be managed by conservative methods and there is usually union of the fracture. If suitable precautions are not taken the fracture undergoes malunion, leading to varus and external rotation deformity at the fracture site and shortening and limitation of hip movements. It is also associated with complications of prolonged immobilization like bedsores, deep vein thrombosis and respiratory infections [4].
Subtrochanteric femoral fractures are associated with high rates of non-union and implant failure, regardless of the method of fixation. Only recently has a better understanding of biology, reduction techniques and biomechanically improved implants allowed for subtrochanteric fractures to be addressed with consistent success [5].

In spite of the advances in anesthesia, nursing care and the surgical techniques, hip fractures remain a significant cause of morbidity and mortality in the elderly population. In view of these considerations, the present study of Surgical Management of Peritrochanteric Fractures is taken up.

Material and Method

The present study consists of 25 adult patients of peritrochanteric factures of femur, who are treated with Proximal Femoral nail in Krishna Hospital Karad. This study was carried out to study the epidemiology of peritrochanteric fractures, to testify the anatomical and functional outcomes of treatment with proximal femoral nail. All these 25 patients included in the study were followed up at regular intervals. After the patient with subtrochanteric or trochanteric fracture was admitted to hospital all the necessary clinical details were recorded in proforma prepared for this study. After the completion of the hospital treatment patients were discharged and called for follow up at outpatient level at regular intervals for serial clinical and radiological evaluation. The patients were followed up till one year after surgery at regular interval and if necessary subsequent follow up was done. In our study we used a standard length PFN of 250 mm with distal

diameter of 10, 11, 12 mm. the proximal diameter of nail is 14mm.The proximal derotation screw of 6.5mm and distal lag screw of 8mm.distal locking is done with self-tapping 4.9mm cortical screws one in static mode and the other in dynamic mode allowing 5 mm dynamisation. The nail is universal with 6 degrees mediolateral angulation and with a neck shaft angle of 135 degrees. We did not use end cap.

Result

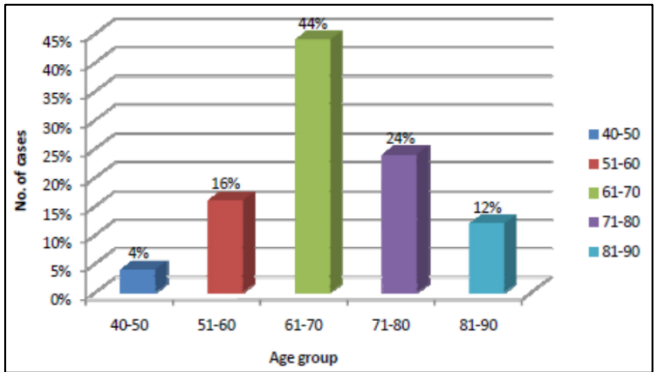

Fig 1: Age Distribution

The following observations were made from the data collected during this study of proximal femoral nail in the treatment of 25 cases of Peritrochanteric fractures of proximal femur in the department of Orthopedic Surgery, KIMS, Karad from August 2008 to August 2009. In our series maximum age is 90 years minimum is 40 years. Most of the patients were between 60-80 years. Average mean age is 67.84 years. In our study males are predominant contributing 17(68%) and females are 8(32%).In this study A2 type of fractures are more common contributing 68%,A1 and A3 type of fractures are 16% each. We had one patient case No.25 of 3rd, 4th and 5th rib fractures of left side which were treated conservatively. Another patient case No.17 had undisplaced fracture distal and radius right side which also were treated conservatively.

In our study we consider the various intraoperative parameters such as duration of surgery, blood loss and difficulty in reduction. Duration of surgery was more for the initial operated cases. More in case in which we had to do open reduction for the fracture. Blood loss measured by mop count (each fully soaked mop containing 50ml blood). More loss was seen in patients who require open reduction. In our study we had one case in which proximal fragment goes in to flexion and adduction in which we had difficulty in reduction for this we had to do open reduction and then fix the fracture.
In our series of 25 operated cases 3 cases were expired before first follow up due to other medical problems and old age. 3 cases were lost follow up after first follow up.
So taking into consideration of 19 cases of which we had 12 months regular follow up.
In our study we used Modified Harris Hip Score for evaluation of hip function. Results were grade as excellent, good and poor. Harris Hip Score details are enclosed with patient's proforma.

Discussion

The treatment of peritrochanteric fracture of proximal femur is still associated with some failures. Before the introduction of proper implant usually these fractures were treated conservatively till 1960. To avoid these complications immediate mobilisation of the patient and restoration of good length operative methods for the choice of the treatment [6]. Varieties of implants were introduced from earlier life Smith Peterson nail, Jewette nail, DHS, Richard's screw and recently used gamma nail reconstruction nails.
All the implants had some advantages and disadvantages. Jewette nail fixed angle nail, plates had the complication like penetration of the nail and cut through superior portion of the head. Later on sliding hip screw was introduced but its use in unstable fracture femur was not good due to excessive collapse. Development of intramdellary device gamma nail or reconstruction nail which having advantage of shorter lever arm with load sharing device. These intramedullary device allows the surgeon to minimize soft tissue [7] dissection there by reducing surgical trauma, blood loss, infection and wound complication [8]. PFN is a novel, modern intramedullary implant based on experience with the gamma nail. The currently used gamma nail as an intramedullary device also has a high learning curve with technical and mechanical failure rates of about 10%.The gamma nail is susceptible to fail at its weakest point, the lag screw-implant interface [9].
The Arbeitsgemeinschaft fur osteosynthesefragen (AO ASIF) in 1996, therefore developed the proximal femoral nail with an antirotational hip pin together with a smaller distal shaft diameter which reduces stress concentration to avoid these failures [13]. Proximal femoral nail has all advantages of an intramedullary device, such as decreasing the moment arm, can be inserted by closed technique, which retains the fracture haematoma an important consideration in fracture healing, decrease blood loss, infection, minimizes soft tissue dissection and wound complications. In an experimental study, Gotze *et al* (1998) compared the loadability of osteosynthesis of unstable per and subtrochanteric fractures and found that the PFN could bear the highest loads of all devices [12].
Proximal femoral nail had all advantages of an intramedullary device such as decreasing lever arm, can be inserted by close technique which retains the fracture

hematoma an important consideration in fracture healing [10]. It decreases the blood loss, infection, minimizes soft tissue dissection and wound infection. The mean duration of hospital stay was 18.64 days. In our study we had 3 cases of implant failure. In one case we had both proximal screw were backing out after first follow up. In another patient we had cut out of neck screw occurred which is comparable 0.6% cases in study conducted by Simmermarcher in 1999. One patient had z effect in which proximal screw goes towards the acetabulum and inferior screw coming out [11, 14]. We had one case of malunion after one year with implant failure. Average union time in our study is 6 weeks to 3 months. In our study 3 cases were expired before first follow up due other medical problem and old age. Three cases were lost follow up after first visit. Overall 94.74% of our cases had excellent to good result.

Conclusion

Most of the complications are surgeon and instruments related which can be cut down by proper patient selection and good preoperative planning. With the experience gained from each case the operative time, radiation exposure, blood loss and intraoperative complications can be reduced drastically. Hence I conclude, though the learning curve of this procedure is steep, with proper patient selection, good instrumentation, image intensifier and surgical technique, PFN remains the implant of choice in the management of Peritrochanteric fractures.

Conflict of interest: No conflict of interest

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