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Study of Unstable Intertrochanteric Fractures in Elderly Treated With Long Proximal Femur Nail

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Abstract

Background: Unstable Intertrochanteric fractures of the proximal femur are the most common injuries in elderly as well as common source of morbidity and mortality in elderly. The aim of this study to analyze the efficacy of closed reduction & internal fixation of unstable Intertrochanteric fractures with long proximal femur nail in elderly aged between 60-80 years. **Materials And Methods:** This study was carried out under the Department of Orthopaedics, S.R.G. hospital Jhalawar. The study consists of 24 patients out of them, 15 were Males and 9 were Females, of Unstable Inter-trochanteric fractures of proximal femur treated with Long Proximal Femoral Nailing available for follow up till one year which was taken as a basic pre-requisite for inclusion in the study. At each follow-up, patients were evaluated clinically and radiologically with appropriate X-rays.

Results: Results were analyzed by using the Harris Hip Scoring System (Modified) at the end of 6 months shows excellent results in 54% (13) of patients, good results in 29% (7) patients, fair results in 13% (3) patients, and poor results in 4% (1) of patients. Postoperative complications are comparatively less in Long Proximal Femur Nail as compared to the other alternative procedures.

Conclusion: The Long Proximal Femur Nail is a simple, economical, and effective single-stage procedure for the management of the unstable intertrochanteric fracture of the proximal femur. It has many advantages over other alternative procedures and allows early weight-bearing with good patient compliance.

Keywords: Unstable Inter-trochanteric fractures, Long proximal femoral nailing, the Harris hip scoring

Introduction

Inter-trochanteric fractures especially unstable type measures one of the most typical injuries occurs in the older population. The incidence is growing upwards because of increase in ageing of human population as well as life-style modifications. [1, 2]

It is an associated trivial trauma in older patients and high energy trauma in younger age patient can lead to fractures configuration. [3]

Non surgical measures includes reduction through traction and immobilization. But it always results in malunion, varus and external rotation deformities leading to short limb gait. Due to the prolonged immobilization, complications like bedsores, deep vein occlusion, respiratory infections will occur. Since the fracture is common in older age patients, the aim of treatment is to stabilize early, rigid and stable fixation, so preventing the complication of prolonged recumbency. This results in recommendation of surgery by internal fixation.

The advantages of operative treatment are:

1. Less timing of hospitalization [4]
2. Reduces complications of prolonged recumbency [4]
3. Early mobilization and weight bearing
4. Physical Walking exercise is possible with new implant and fixation techonology [5]
5. Helps to achieve anatomical reduction.

There are various types of implants available for fixation of Inter-trochanteric fractures both intramedullary as well as extra medullary. It consists of Dynamic Hip Screw (Extra medullary fixation), Gamma Nail and Proximal Femoral Nail (Intramedullary Fixation). To overcome the disadvantage of the dynamic hip-screw (collapse of femoral Neck and shortening of leg), a new intramedullary fixation device was introduced for treatment of unstable intertrochanteric fractures. Gamma nail is the old and outdated version of intramedullary fracture fixation.

The proximal femoral nail (PFN) was introduced in 1997 by Mathys Medical, Bettlach, Switzerland for treatment of unstable inter trochanteric fractures. The fixation of fracture with PFN provides minimal surgical incision which leads to reduced chances of postoperative infection [6].

Aims and Objective

The objective of this study was to ascertain the clinical results of unstable Inter-trochanteric fractures of proximal femur treated by Long Proximal Femoral nail.

Methods and materials

This study was carried out under the Department of Orthopaedics, S.R.G. hospital Jhalawar.

The study comprised of 24 patients (15 males and 19 females) between age group 60-80 years, with unstable Inter-trochanteric fracture treated with Long Proximal Femoral Nail.

Inclusion criteria

All patients who gave their wilful consent to participate in the study

- Unstable intertrochanteric fractures
- 31A2 and 32A3 fracture types in (AO/OTA) method of classification,
- Age 60-80 yrs.

Exclusion Criteria

- Patients less than 60 years of age and more than 80 years of age.
- Fracture of neck and Shaft of femur
- Patients who were bedridden previously
- Segmental fractures
- Metabolic bone disorders or Pathological fractures
- Underlying neuromuscular disorder
- Patients unfit for surgery
- Patient not willing to give Consent

Preoperative planning

All the patients were subjected to through assessment including recording of history, physical examination,

pre anaesthetic workup and patient compliance. AP, lateral and oblique radiographs were obtained and in selected cases CT scan was also done.

Surgical technique

Patients were positioned supine on the fracture table under spinal or general anaesthesia in line with the condition of the patient. Fracture was reduced by longitudinal traction and therefore the limb was placed in slight movement to facilitate nail insertion through the pyriform fossa.

A straight lateral incision was made of five cm cranial to the tip of the greater trochanter, extending 3-5 cm proximally. A 2.8 millimetre threaded guide wire was inserted from the tip of the greater trochanter with the help C-arm.

In cases wherever long proximal femoral nail (PFN) was used, distal femur was reamed with increasing diameters of flexible reamers up to 11 millimetres.

After mounting the acceptable sized nail on the insertion device the nail was introduced manually into the femoral shaft. The hip pin was introduced initial, then the neck screw of applicable size was inserted.

Afterwards looking on the kind of fracture, distal interlocking either statically or dynamically was achieved with free hand in long proximal femoral nail (PFN). The incision was closed in layers and sterile dressing was done with adhesive plaster.

Postoperative Follow up

Postoperatively, the limb elevation was done with a pillow. Intravenous antibiotics were given for first 48 hour, followed by oral antibiotics for the further 3 days. On the 4th postoperative day Static quadriceps exercises was started. Active quadriceps and hip flexion exercise were started on 6th and 7th postoperative day. Dressing done on 2nd, 5th, and 8th postoperative days. Sutures were removed on 12th postoperative day. Patients were advised to walk non-weight bearing with a walker when tolerable. At about 4 weeks postoperatively partial weight bearing was started. Full weight bearing was allowed after assessing the radiological and clinical union. The presence of callus radiologically and absence of tenderness was considered bony union. Patients were evaluated at 4 weeks, 12 weeks, and 24 weeks. The patients were assessed using the Harris Hip Scoring System (Modified) at the end of 6 months.

Results

This study involved 24 cases of Unstable intertrochanteric fractures of either sex above the age of 60. All cases were treated by intramedullary fixation with a Long PFN. The age distribution was from 60 to 80 years (average 74 years). The largest group of patients was from 60 to 70 years. There were 15 males (63%) and 9 females (36%) in the study.

All the fractures were classified under OTA classification. Fracture pattern, 31A1 was considered stable and 31A2 and 31A3, unstable fractures. In our study, No patients were from fracture pattern 31A1, 17 patients (71%) suffered from 31A2 and 7 patients (29%) from 31A3.

18 patients (75%) sustained the fracture due to a fall and 6 patients (25%) due to road traffic accident. Most of the patients who sustained the fracture due to fall were older in age and had osteoporosis.

Average operating time was 65 min (32–95 min) after anaesthesia. Closed reduction was achieved in 19 patients (79%) whereas 5 patients (21%) required open reduction. The average hospital stay was 15.11 days. It was more in patients with co-morbid conditions and complications with highest being 22 days.

We faced complications and treatment failure in 5 (22%) patients. Early complications include inadequate

reduction in one patient (4%), failure to put derotation screw in one patient (4%), difficulty in distal locking in one patients (4%), varus deformity in one patient (4%), superficial infection in two patients (8%), implant failure in two patients (8%), and z effect in one patient (4%). Other complications include shortening in one patient (4%) and malunion in one patient (4%). Breakage of nail and inadequate fixation were considered implant failure.

According to Harris Hip score (Modified) criteria, we had excellent results in 54% (13) of patients, good results in 29% (7) patients, fair results in 13% (3) patients, and poor results in 4% (1) of patients.

Discussion

The productive treatment of Intertrochanteric fracture with Long PFN depends on a number of factors such as overall patient health, duration from fracture to treatment, adequacy, and severity of repair. As Inter-trochanteric fractures were more common in elderly patients, pathology was taken into consideration. Osteoporosis can be a condition characterized by low bone mineral density and the technical integrity of the risk factor leading to bone failure even at low load. Singh's Grading of osteoporosis has been used to judge bone quality. But with outcome surgery, the combined influence of pathology and fracture pattern is considered. The first pattern of stable stability is a 2 part fracture in the traditional (non bone osteoporotic bone). A moderate degree of instability is seen in the rupture of four traditional bone fragments and 2 of the osteoporotic bone fracture. The fragmentation of the four osteoporotic bone is the least stable between inter-trochanteric fractures[7].

The DHS is considered a gold standard for treatment due to its favorable effects and low level of complications when used in the treatment of stable fractures [8]. Along with the need for more exposure, more tissue trauma is associated with the fall of intra and postoerative varus especially when applied to unstable fractures and oblique fractures, ultimately leading to split shaft and deformity [9]. In such cases, intramedullary correction with PFN may be helpful. Intramedullary devices have been shown to be biologically strong and able to withstand high static loads and repetitive motions than a strong hip screw [10] . The inner buttress provides a sufficient reduction in the focus of implant stress and fatigue [11]. PFN also acts as a buttress to prevent the medialization of the shaft. Moreover, therefore, the fracture heals without the primary restoration of internal support. The insertion of nail restores the function of the inner column [12].

The location of the nail near the weight-bearing axis reduces the stress exerted on the installation to the maximum. The PFN penetration point is located in the greater trochanter, thus reducing hip injury by contrast with the gamma nail inserted through the pyriformis fossa and by the derotation screw reduces the chances of cutting compared to the gamma nail [11,13,14].

The anatomical reduction and safe adjustment of the patient at the table were crucial for easy management and rational surgical effect. The point of penetration of the nail was taken from the tip or pyriform fossa. As the nail has a 6 ° valgus angle medial entry point causing further disruption of the fracture. The hip joint was inserted 5 mm from the subchondral bone within the lower extremity within the anteroposterior view (AP) and the area around the neck within the lateral view. The cervical screw should be placed similar to the hip screw in the AP view, and that they should be highlighted in the following view. Ideally, the cervical

screw should be 10 millimeters shorter than the hip screw. This ensures that the cervical screw does not carry a load but performs an anti-circulation function. Failure to try to do this ends in a “Z-effect,” when the cervix recedes, and the pelvic pin ruptures or vice versa. we tend to detect this problem in one patient. The patient underwent further surgery and the fracture recovered. 2 patients (8%) have implants-related implants. There was no case of non-union. The total problem rate was 22%. This equation with Gadegone and Salphale [15] was slightly lower than their study. Within a series of 295 patients with trochanteric fractures treated with PFN by Domingo et al. [16] The average patient's age was 80 years, which accounted for about 27% of patients experiencing complications within the immediate surgery. Although the high duration of Long PFN can be a minor problem compared to the hip screw screw, we tend to believe that the treatment of intertrochanteric fractures especially the unstable pattern with the Long PFN can be a sensible and economical method.

Conclusion

Regardless of the fracture type, adequate fracture reduction is critical in the management of intertrochanteric fractures. Long Proximal femoral nailing following good anatomic reduction is an efficient and minimally invasive surgical treatment for intertrochanteric fractures particularly of unstable fracture patterns probably due to better axial telescoping and rotational stability.

Fig.1: Pre Op Xray

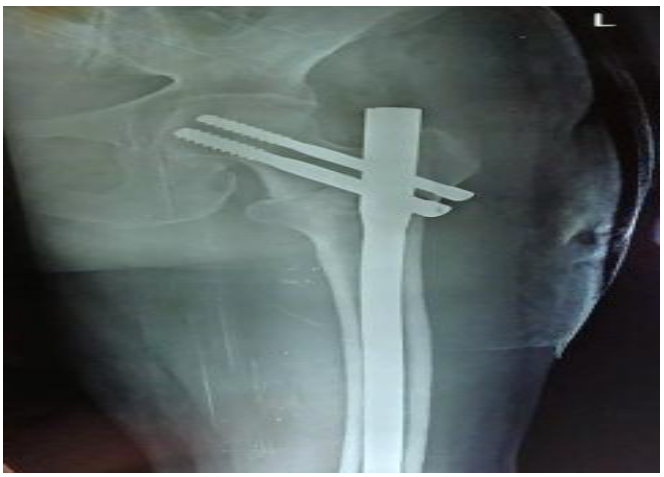

Fig. 2: Post Op Xray (proximal)

Fig. 3: Post Op Xray (distal)

Fig. 4: Patient Positioning in Traction Table (side view)

Fig. 5: Patient Positioning in Traction Table (front view)

Fig. 6: Incision and Guide wire insertion

Fig. 7: Reduction confirmed with C-ARM

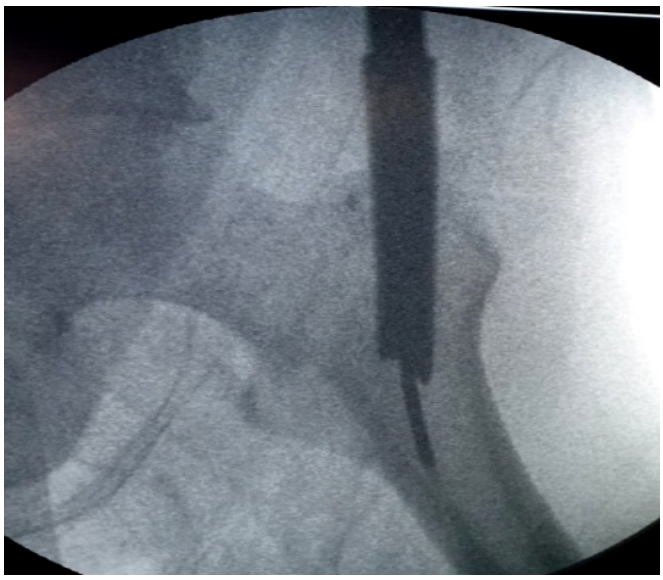

Fig 8: Entry awl insertion

Fig. 9: Guide wire insertion (C-ARM)

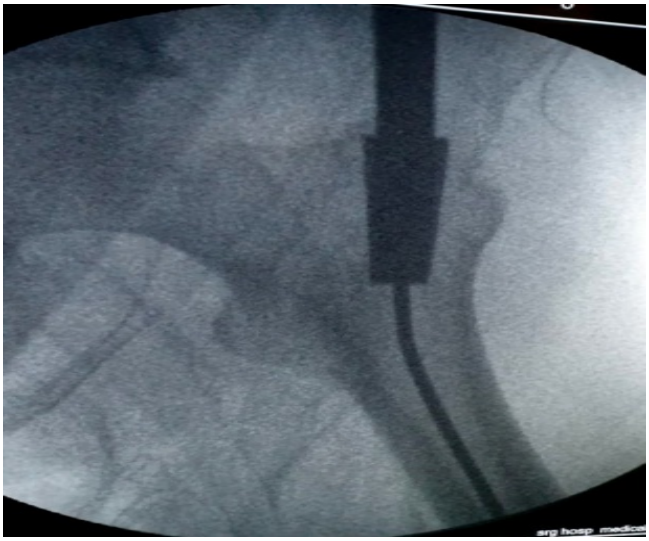

Fig.10: Entry Reamer insertion

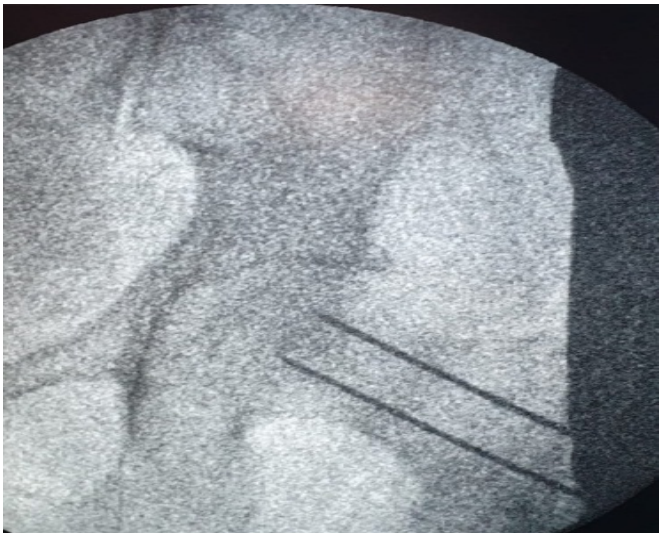

Fig. 11: Parallel guide wires for screws checked in C-ARM (AP view)

Fig. 12: Parallel guide wires for screws checked in C-ARM (Lateral view)

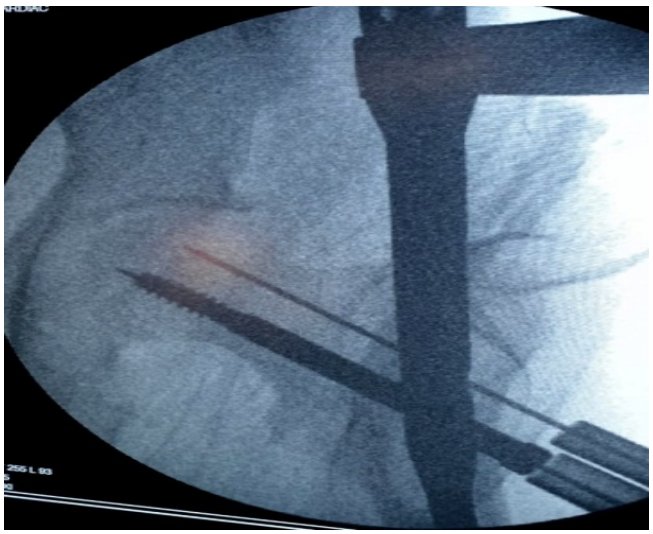

Fig. 13: Lag screw inserted

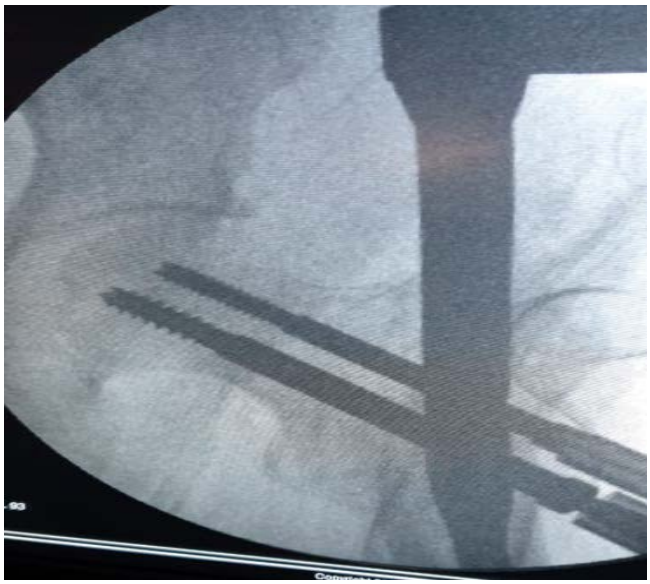

Fig. 14: Derotation Screw inserted

Fig. 15: Distal locking with cortical screw

References

1. Cummings SR, Rubin SM, Black D. The future of hip fractures in the United States. Numbers, costs, and potential effects of postmenopausal estrogen. Clin Orthop Relat Res, 1990; 252:163-66.
2. Kannus P, Parkkari J, Sievänen H *et al*. Epidemiology of hip fractures. Journal of Bone and joints, 1996; 18(1):57- 63.
3. Terry canale S, James Beaty H. Campbell's Textbook of Operative orthopaedics. 2008; 3(11):3237.
4. Kaufer H, Mathews LS, Sonstegard D. Stable Fixation of Intertrochanteric fractures. J Bone Joint Surg. 1974; 56A:899 907.
5. Robert Bucholez W, James Hechman D, Charles court Brown M. Rockwood Greens fracture in adults Volume 2, 6th Edition 2006 Lippincott Williams and Wilkins Co.1827-1844
6. Halder SC. The gamma nail for peritrochanteric fractures. JBJS (Br) 1992; 74:340-4.
7. Laros GS. The role of osteoporosis in intertrochanteric fracture. Othop clin North America. 1980; 11:479.
8. Klinger HM, Baums MH, Eckert M, Neugebauer R. A comparative study of unstable per- and intertrochanteric femoral fractures treated with dynamic hip screw (DHS) and trochanteric butt-press plate vs. proximal femoral nail (PFN). Zentralbl Chir 2005;130:301-6.
9. Murray RC, Frew JF. Trochanteric fractures of the femur; a plea for conservative treatment. J Bone Joint Surg Br 1949;31B:204-19.
10. Curtis MJ, Jinnah RH, Wilson V, Cunningham BW. Proximal femoral fractures: A biomechanical study to compare intramedullary and extramedullary fixation. Injury 1994;25:99-104.
11. Menezes DF, Gamulin A, Noesberger B. Is the proximal femoral nail a suitable implant for treatment of all trochanteric fractures? Clin Orthop Relat Res 2005;439:221-7.
12. Pavelka T, Houcek P, Linhart M, Matejka J. Osteosynthesis of hip and femoral shaft fractures using the PFN-long. Acta Chir Orthop Traumatol Cech 2007;74:91-8.
13. Ansari Moein CM, Verhofstad MH, Bleys RL, van der Werken C. Soft tissue injury related to choice of entry point in antegrade femoral nailing: Piriform fossa or greater trochanter tip. Injury 2005;36:1337-42.
14. A.O. Dialogue 15; Proximal femoral nail. December 2002; Issue ii.
15. Gadegone WM, Salphale YS. Proximal femoral nail – An analysis of 100 cases of proximal femoral fractures with an average follow up of 1 year. Int Orthop 2007;31:403-8.
16. Domingo LJ, Cecilia D, Herrera A, Resines C. Trochanteric fractures treated with a proximal femoral nail. Int Orthop 2001;25:298-301.