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To compare the clinical and radiological outcome of unstable intertrochanteric fracture patients treated with Dynamic Hip screw vs proximal femoral nail A2

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Abstract

Introduction: Intertrochanteric fracture account for a common problem in elderly patients following trivial fall. Intertrochanteric fracture are the extracapsular fracture of the proximal femur at the level of the greater and the lesser trochanter. Unstable intertrochanteric fracture have comminution at the posteromedial cortex, thinner lateral wall thickness of <20mm and reverse oblique fracture.

Aim: To compare the clinical and radiological outcome of unstable intertrochanteric fracture patients treated with Dynamic Hip screw vs Proximal femoral nail A2

Materials and method: around 30 cases of unstable intertrochanteric fracture treated with proximal femoral nail A2 or dynamic hip screw. Around 6 months follow up was done. Both the fractures were treated using lateral approach. For PFNA2 the awl and subsequently the guide wire were put either in the piriformis fossa or medial to the tip of greater trochanter. Then reaming done and PFNA2 nail put. For DHS, Harding approach is used, derotational screw put and then guide wire put in posteroinferior quadrant or the center of the head of femur. Triple reaming done and Richard screw put and the DHS put. Post op physiotherapy is started on day 2 after surgery in all the patients.

Discussion: PFNA2 in unstable intertrochanteric fracture has better outcome and lesser postoperative complications compared to DHS. Average time for full weight bearing walking is around 6 weeks.

Conclusion: PFNA2 in Unstable intertrochanteric fracture is better than DHS.

Keywords: Unstable Intertrochanteric Fracture, Proximal Femoral Nail A2, Dynamic Hip Screw.

Introduction

Intertrochanteric fracture is defined as extra capsular fracture of the proximal femur that occurs between greater trochanter and lesser trochanter. The calcar femorale is the vertical wall of dense bone that extends from posteromedial aspect of femoral shaft to posterior

portion of femoral neck. This structure is important because it determine whether or not fracture is stable [1]. In young age, intertrochanteric fracture occurs due to high energy injury [2] such as car crash or fall from roof. It occur more common in old age group, does occur on low energy trauma due to weakening of bones as we age. Intertrochanteric fractures which are unstable have high morbidity [3,4]. Unstable intertrochanteric fracture have comminution at the posteromedial cortex , thinner lateral wall thickness of <20mm, have subtrochanteric extension of the fracture and reverse oblique fracture

Materials and methods subject

The study involved the patients diagnosed with unstable intertrochanteric fracture were treated at our facility from June 2019 to June 2021. Patients were clinically examined and had restricted range of motion of affected limb and x-ray pelvis with both hip and cross table lateral view of the affected limb, were taken after stabilizing the fracture on Thomas splint to confirm the diagnosis.

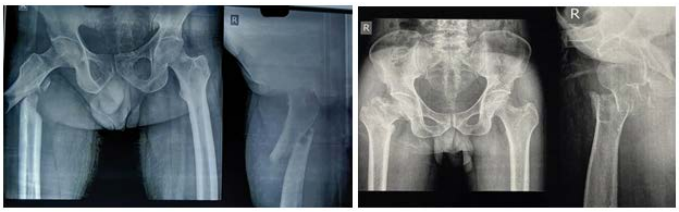

Figure 1: X ray of patients showing unstable intertrochanteric fracture.

Inclusion criteria: All unstable types of fracture pattern AO/OTA type 31A2.2 to 31A3.3, Age between 18 - 90 years, Men and women both included in study, Patients who are an aesthetically fit for the surgery,

Comminated lateral wall of proximal femur with lateral wall thickness less than 2.5cm.

Exclusion criteria: Age < 18 years, Pathological fractures, Previous surgery on proximal femur, Patients with intertrochanteric femur fracture treated with other modalities of internal fixation, Old non-unions and mal-unions.

Patients were followed up for 6 months and were assessed on the basis of Harris hip score.

Surgical technique of treating unstable intertrochanteric fracture

In case of PFNA2 insertion, and patient with unstable intertrochanteric fracture were positioned in supine position and put on traction table with adequate traction and countertraction and fracture reduced and checked under c arm image intensifier. Draping done in that position of the affected limb. And then longitudinal incision above around 1cm from the greater trochanter going proximally around 4cm. Split the subcutaneous tissue, fascia over the gluteus Medius. Then tip of Greater Trochanter is felt with the index finger. Entry with the Awl taken slightly medial to the tip of the greater trochanter or piriformis fossa. The position of the Awl was confirmed under the image intensifier. Using straight Awl, the entry portal was centered on the anteroposterior & the lateral view to ensure that nail is in the mid plane of the femur. In lateral view the entry point is in vertical line of the femoral canal.

Guide wire insertion: after withdrawing the awl, insert a guide wire crossing the fracture site.

Reaming and Nail insertion: Gradually size of reamer increased and Reaming done one size bigger then the desired nail insertion. The nail is inserted directly over guide rod. The nail is passed slowly over fracture site in cases of comminuted fracture.

Proximal screw insertion: after proper checking the nail in ap and lateral position. Guide wire passed after taking incision, passed through sleeve crossing the fracture site into the head of the femur till the subchondral region and checked in ap and lateral view if it is central or

posteroinferior position. If in position then rimming done with 8mm reamer and adequate size screw put till the subchondral region. Taking the Tip apex distance less than 25mm in both Ap and Lateral view.

Distal screw insertion: done with the jig.

End cap insertion: after checking the nail, if found adequate with end cap inserted over the PFNA2 nail and was given, closure done.

Figure 2: Patient with unstable intertrochanteric fracture in supine position on traction table

Figure 3: Incision site marked for PFN A2 insertion (1) and DHS insertion (2).

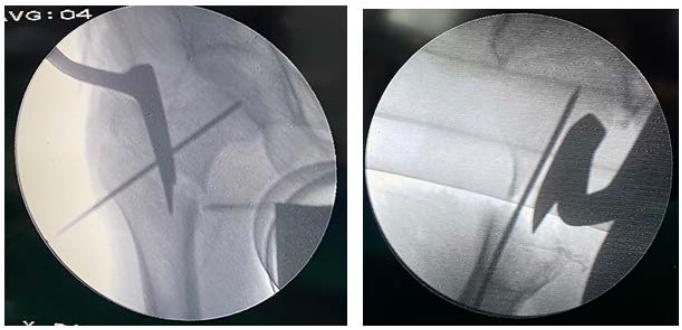

Figure 4: Awl inserted for PFN A2 insertion, in the piriformis fossa or medial to greater trochanter and checked in AP and Lateral view in C-Arm.

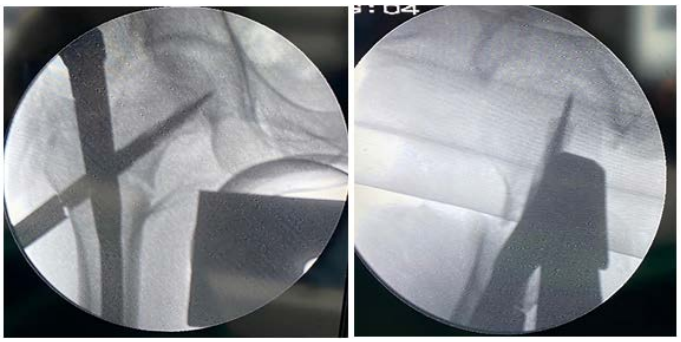

Figure 5: PFN A2 blade inserted and checked in AP and Lateral view.

1) In case of DHS insertion: patients were placed supine on the traction table with adequate traction and counter-traction, keeping the affected leg in adduction and internal rotation, the fracture is reduced and checked in C-arm in both Anteroposterior and Lateral view.

2) Approach used: lateral approach or modified hardinge approach is used. Incision starts from the greater trochanter going distally of around 5cm length. Superficial dissection and Deep dissection done, tensor facia lata cut, vastus lateralis cut in reverse L shaped fashion starting proximally and going distally. The lateral proximal femur reached.

3) Insertion of guide pin: the level of insertion of the guide pin varies with the angle of plate used. The guide pin is inserted within 1cm of the subchondral bone in the head of femur, positioned in the Centre or in the

posteroinferior quadrant in the femoral head and confirmed under C-arm in both AP and Lateral view.

The guide pin placement instrument can be used to insert a parallel guide pin proximal to the primary guide pin. This provides temporary stability for unstable fractures, in which reduction can be lost if guide pin backs out during reaming. It also provides rotational stability to the fragment.

4) **Triple reaming and lag screw insertion**: after the guide pin placement in central quadrant or posteroinferior quadrant, derotational screw if required put in the head of the femur.

Triple reaming done after calculating the adequate size and checked in ap and lateral view. Lag screw inserted in the head of the femur and checked in c-arm in ap and lateral view.

5) **Insertion of plate:** At the end of the screw insertion, the T handle of the wrench should be parallel to the femoral shaft; and the DHS plate put over it. The distally cortical screws of 4.5mm put. Then Compression screw put at the end of Richard screw.

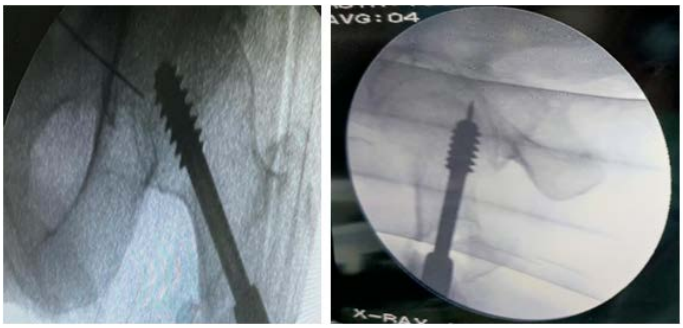

Figure 6: Richard screw inserted in Dynamic hip screw and checked in AP and Lateral view in C Arm.

Post-operative management

- The patient is kept in head low position with 2 blocks under the bed., to avoid post spinal headache.
- Strengthening quadriceps and Hamstring, knee ROM and Ankle toe movement were started on POD 2 in all the patients.
- The patients were discharged with the advice not to do full weight bearing on the affected limb till at least 6 weeks. After which patient can do partial weight bearing for 1 week and full weight bearing subsequently as per pain tolerance by the patient.
- Patients asked to follow up in OPD after 1 week, 3weeks, 6weeks, and after that every month for at least 6 months.
- Running and exercise were allowed depending on clinical and radiological union of fracture.
- At the end of 6 months modified Harris hip score of the patient was calculated and the results were compared.

Figure 7: Post op x ray of PFN A2.

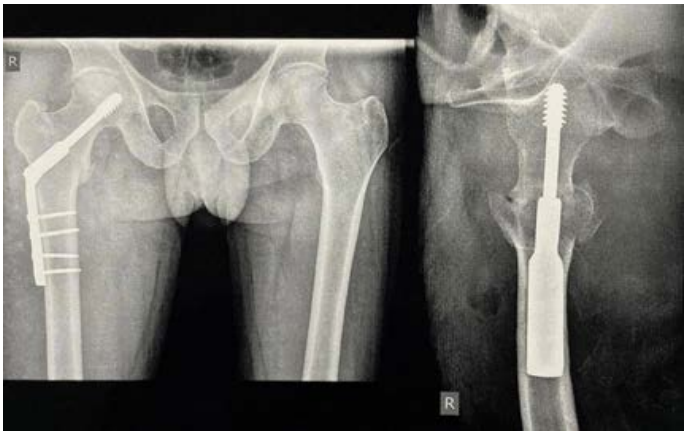

Figure 8: Post op x ray of DHS.

Results

Average waiting time of surgery was 3 days. Range 1-6 days. 24 patients in our study achieved the radiological union after the 6 months follow up of surgery. 6 patients developed complications of non-union due to Lag screw break or Lag screw cut out. Out of these 6 patients, 5 were treated with Dynamic hip screw and! was treated with PFNA2.

The patient reported outcome was measured using the modified Harris hip score. Among patients treated with PFNA2, the score was considerably better than those treated with Dynamic hip screw.

Range of motion and strength of the injured limb were measured and recorded. These values were compared to the uninjured limb. The functional outcome of patients treated with PFNA2 was found to be better than the patients treated with DHS.

Discussion

The present study aimed to evaluate the post operative outcome of unstable intertrochanteric fracture treated with proximal femoral nail A2 vs Dynamic hip screw. Most of the patients treated were elderly age group mostly above 60, which highlights the fact that these fractures are much more common in elderly people.

In our study the mean range of motion of the injured limb and the Harris hip score were found to be better for the patients treated with Proximal Femoral Nail A2 than those treated with Dynamic Hip Screw. Mean Harris hip score in patients treated with PFNA2 was 88.7 and those treated with DHS had 80.4.

Also, the patients treated with Dynamic hip screw developed more complications like non-union due to screw break or screw cut out, compared to those treated with dynamic hip screw. Out of 15 patients treated with DHS 5 developed non-union compared to 1 patient in PFNA2 who developed non-union of the unstable intertrochanteric fractue. DHS often fails to give good results in the unstable and reverse oblique fracture, which limits its clinical use in Unstable Intertrochanteric fracture. [6,7,8,9]. PFNA2 provides angular and rotational stability, which is especially important in osteoporotic bone, and allows early mobilization and weight bearing on the affected limb [10].

Conclusion

In conclusion the study shows that patients of unstable intertrochanteric fracture treated with proximal femoral nail A2 is superior clinical and radiological outcomes compared to the patients treated with Dynamic Hip Screw.

References

1. Sun QZ, Ruan CQ, Li GM, Chen WL, Ding Q, Zhang CJ. [Comparison of clinical effect between reconstructing femoral calcar and proximal femoral antirotation nail for the treatment of unstable femoral intertrochanteric fracture in elderly patients]. Zhongguo Gu Shang. 2016 Aug 25;29(8):684-688. Chinese. doi: 10.3969/j.issn.1003-0034.2016.08.002.PMID: 29282923.

2. Hwang LC, Lo WH, Chen WM, Lin CF, Huang CK, Chen CM. Intertrochanteric fractures in adults younger than 40 years of age. Arch Orthop Trauma Surg. 2001;121(3):123-6. doi: 10.1007/s004020000190. PMID: 11262774.

3. Bannister GC, Gibson AG, Ackroyd CE, Newman JH. The fixation and prognosis of trochanteric fractures. A randomized prospective controlled trial. Clin Orthop 1990;254;242–6.

4. Bridle SH, Patel AD, Bircher M, Calvert PT. Fixation of intertrochanteric fractures of femur. A randomized prospective comparison of the Gamma nail and dynamic hip screw. JBJS 1991,73(2):3304.

5. Kregor, Philip J. MD*; Obremskey, William T. MD, MPH*; Kreder, Hans J. MD, MPH†; Swiontkowski, Marc F. MD‡ Unstable Per trochanteric Femoral Fractures, Journal of Orthopaedic Trauma: August 2014 - Volume 28 - Issue - p S25-S28. doi: 10.1097/BOT.0000000000000187

6. Bucholz RW, Heckman JD, Court- Brown CM, Tornetta III P. Intertrochanteric Fracture. In: Rockwood and Green's Fracture in Adults Vol. 2. 7th ed. Lippincott Williams &Wilkins:1597–640

7. Radford PJ, Need off M, Webb JK: A prospective randomised comparison of the dynamic hip screw and the gamma locking nail. J Bone Joint Surg Br 1993;75(5):789–93.

8. Haidukewych GJ. Intertrochanteric fractures: ten tips to improve results. J Bone Joint Surg Am 2009;91:712–9.

9. Kaplan K, Miyamoto R, Levine BR, Egol KA, Zuckerman JD. Surgical management of hip fractures: an evidence-based review of literature. II: Intertrochanteric frac- tures. J Am Acad OrthopSurg 2008;16:665–73.

10. Mallya S, Kamath SU, Madegowda A, Krishnamurthy SL, Jain MK, Holla R. Comparison of radiological and functional outcome of unstable intertrochanteric femur fractures treated using PFN and PFNA-2 in patients with osteoporosis. Eur J OrthopSurg Traumatol. 2019 Jul;29(5):1035-1042.