



Outcome analysis of inter-trochanteric fractures treated with DHS plate using 32mm threaded Lag screw.

ORTHOPAEDICS

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ABSTRACT

Introduction: Inter-trochanteric fracture is commonly seen in elderly age group which is usually associated with osteoporotic bones. In general fracture fixation done with DHS plate using 16mm threaded lag screw. With this fixation in osteoporotic bone have high cut-out incidence. To overcome this problem we used 32mm threaded lag screw. **Material and Method :** Its a prospective study has been conducted at R.N.T. MEDICAL COLLEGE, UDAIPUR, RAJASTHAN, during the period from JAN 2015 to December 2016. 40 elderly patients (>60 years) with Intertrochanteric fractures who met the inclusion criteria treated with dynamic hip screw fixation using 32mm threaded lag screw were selected for the study. **Results :** During this study the mean union time was 13.54 weeks. The mean time for protected weight bearing was 9.73 days and mean time for patients to walk without support in cases was 13.2 weeks. There were .59 cm mean limb length shortening seen in final post operated follow up. No incidence varus collapse or superior screw cut out was observed in any of the patients in spite of weight bearing ambulation from the early postoperative period. **Conclusion:** Fixation of inter-trochanteric fracture femur with dynamic hip screw using 32mm threaded lag screw is likely to reduce the incidence of complications of fixation like implant failure in spite of early weight bearing, like screw cut, AVN, malunion, in elderly patients with intertrochanteric femur fractures.

KEYWORDS:

Fracture IT femur, DHS plate fixation, 32mm threaded lag screw

INTRODUCTION

Fracture of proximal femur and hip are relatively common injuries in adults. Females are more prone than males by a margin of 3:1.⁽¹⁾ This fracture is totally extracapsular. In inter-trochanteric fracture, internal rotators of hip remain attached with distal fragment where as some of the external rotators are still attached with proximal fragment. Goal of treatment is early mobilisation and re-turn of patients to their pre-fracture level of functions without long term disability and avoiding medical complications of prolonged recumbence.

Operative treatment:

The first implant to be used with success was Fixed-angle Nail-plate (e.g., Jewett nail, Holt nail) consisting of Triflanged nail fixed to a plate at an angle between 1300 and 1500. Although these devices provided stabilisation of the femoral head and neck fragment to the femoral shaft, they did not allow fracture impaction. If significant impaction of the fracture site occurred, the implant would either penetrate into the hip joint or cut out through the superior portion of the femoral head and neck. If, on the other hand, no impaction occurred, lack of bone contact would result in either plate breakage or separation of the plate and screws from the femoral shaft. These complications occurred much more frequently when these devices were used to treat unstable fractures.

The experience with fixed-angle nail plate devices indicated the need for a device that allowed controlled fracture impaction. This gave rise to Sliding Nail-Plate devices which consisted of a nail that provided proximal fragment fixation a sideplate that allowed the telescope within a barrel. Impaction provided bone-on-bone contact, which promoted fracture union; implant sliding also decreased the moment arm and stress on the implant, thereby lowering the risk of implant failure.

Dynamic hip screw (DHS) has been the standard treatment for stable inter-trochanteric fracture patterns, but complications of lag screw cut out from a superior aspect, due to inadequate bone anchorage; occur frequently in elderly osteoporotic patients. We used 32mm threaded lag screws to observe the results regarding screw cut-out in inter-trochanteric fractures. *We used 32mm threaded lag screws have more bone anchorage in comparison to conventional screws in DHS plate system. Due to more anchorage the chances of screw cut out and neck shaft angle change are less.*⁽²⁾

AIMS AND OBJECTIVES

To assess the outcome and efficacy of intertrochanteric femur fractures treated with DHS Plate using 32mm threaded lag screw.

MATERIALS AND METHOD

Study has been conducted at R.N.T. MEDICAL COLLEGE, UDAIPUR, RAJASTHAN, during the period from Jan 2015 to December 2016. 40 elderly patients (>60 years) with Intertrochanteric fractures who met the inclusion criteria treated with 32mm threaded lag screw DHS plate were selected for the study. The follow up period ranges from 6 months to 12 months.

Inclusion criteria

- Closed intertrochanteric fracture
- Age more than 60 years
- Patient giving informed consent for the study

Exclusion criteria

- Open fracture
- Subtrochanteric fracture
- Pathological fracture
- Intracapsular fracture neck of femur
- Patient with multiple injuries
- Patients who were non ambulatory prior to the injury
- Patients with dementia severe enough to limit their ability to comply with postoperative rehabilitation

SURGICAL MANAGEMENT

- A. Patients in supine position
- B. Under regional / general anaesthesia.
- C. Patient on traction table under IITV (IMAGE INTENSIFIER TV)
- D. Full aseptic precautions.
- E. Closed reduction and internal fixation with DHS plate using 32mm threaded lag screw.

Dynamic hip screw plate system available in 316 L stainless steel consist of 32mm threaded lag screw of size from 55 mm to 110 mm, coupling screw, plate of different hole size.



Fig 15: Surgical instruments

Operative steps of Dynamic hip screw:-

Position: The patient is positioned on the fracture table with limb in neutral rotation or slight external rotation and neutral adduction abduction.

Reduction technique: The fracture is reduced by longitudinal traction on abducted and externally rotated extremity. While traction is maintained, adduct the limb and internally rotate it at the same time.

Operative steps: Preoperative planning of fracture reduction and selection of an adequate implant length is performed with specific templates.

Part was prepared on OT table and painted with betadine and extremity draped with sterile sheet.



Fig 16: PATIENT ON TRACTION TABLE

Approach the trochanter from lateral incision over the base of trochanter and split the vastuslateralis muscle and elevate the periosteum and insert guide wire from 2 cm distal to vastuslateralis ridge.



Fig 17: Operating procedure

OBSERVATION

Each patient was followed-up for minimum of 6 month or till the bony union.

1.AGE: The mean age of the patients was 77.30 years (> 60 years) of age.

Age of the patients (in years)	No. of patient
61- 70	10
71- 80	15
81-90	12
90 - 105	3

AGE GROUP (IN YRS)

Fig 18: Distribution of patients according to age

2.SEX : In our study 70% of the patients were female and 30 % of the patients were male.

3.Mode of Injury: 80% of the patients in this study had sustained low velocity injuries due to fall on floor or trivial trauma whereas 20% sustained injuries due to RTA.

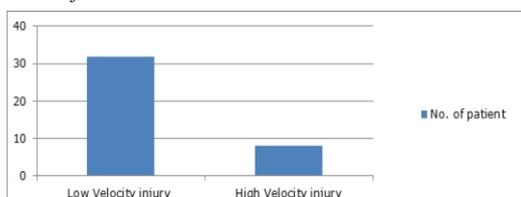


Fig 20: Mode of injury

4.Side of injury: In present study left side is more involved (60%) than right side (40%).

5.CLASSIFICATION

All fractures were classified according to the A.O. classification.

Type of Fracture as per A.O classification

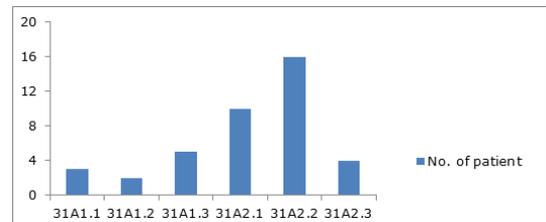


Fig 22: A.O. classification

6.Operative time: The mean time in surgery was 50.4mins

Duration in Minutes	No. of patient
< 55 min.	28
55-65 min.	8
> 65 Min.	4

Fig 23: Operative time

7.Amount of blood loss:

The mean amount of blood loss in surgery was 160-200 ml (180 ml). It is measured by soaked gauge pieces.

POST-OPERATIVE RESULTS

8.Limb length shortening:

In present study limb length shortening with mean of 0.58cm.

9.Protected Weight Bearing (with crutch / walker):

1) Non-weight bearing walk - pt started walking with walker by operated limb hanging on 3rd post op day.

2) Partial weight bearing - mean time for partial weight bearing was 9.73days

10.Walking without support: The mean time for patients to walk without support in case of DHS was 13.2 weeks.

Walking without support

In Weeks	No. of patient
< 12 weeks	3
12-15 weeks	35
> 15 weeks	2

11.Union time:

The mean radiological union time for inter-trochanteric fracture fixed with DHS using 32mm threaded lag screw was 13.54 weeks (12 weeks to 16 weeks).

13.Functional status: Salvati and Wilson’s scoring system: (2)

This uses four parameters Pain, Walking, Muscle power and motion, and Function to evaluate a holistic score indicating the level of rehabilitation achieved by the patient.

DISCUSSION

1. Age distribution:

Mean age is 77.30years. Gallagher et al (1980) reported an eight fold in-increase in trochanteric fractures in men over 80 years and women over 50 years of age. (3)

3. Mode of Injury

82% of the patients had sustained low velocity injuries due to trivial trauma whereas 18% sustained injuries due to RTA.

4. Type of fractures

According to A.O. classification 69.69% of patients has unstable type of fractures and 30.30% were of stable type of fractures.

5. Side of fracture

In present study left side is more involved (52%) than right side (48%).

6. Average time of Fracture Union

In present study, mean radiological union time was 13.54 weeks (12 weeks to 16 weeks).

7. Intra operative mean blood loss

The mean amount of blood loss in surgery was 130-160 ml. Amount of blood loss was reduced by using cautery.

8. Operative time

The mean time in DHS surgery was 50.4 minutes (45-70 minute), which is comparable to previous studies.

9. Protect weight Bearing (with crutch / walker) and walking without sup-port:

Mean for starting Protect weight bearing (with crutch / swalker) was 9.73 days and without support was 13.2 weeks.

10. Tip apex distance

In present study the average TAD was 20.8 mm. No superior migration of the screw was observed in any of our cases, in spite of the fact that TAD was more than 25 mm in 10 of our cases.(4)

b) Wound Complications

Superficial wound infection was seen in 1 case Superficial wound infection at the suture site.

(c) Implant related complications

(i) Screw Cut out:

No single case of screw cut out was seen in 12 month follow up period.

(ii) Limb length shortening

There were 0.59 cm mean limb length shortening seen in final post operat-ed follow up.

Seven cases had less than anatomical reduction due to comminution of var-iable degree at fracture site, as observed in the immediate postoperative period& concentric collapse at fracture site resulting in >1cm of shortening.

(iii) Bone necrosis or AVN hip

No incidence of bone necrosis or AVN hip in our series.

12. Functional outcomes(as per Salvati & Wilson score system):

The functional status was excellent in 78%, good in 18% and fair in 5% cases. Most of the patients were able to regain their prefracture mobility status with a mean hip pain score of 8.36, walking capacity score of 8.42, muscle pow-er and motion score of,7.81 function score of 7.15

CONCLUSION

Fixation of inter-trochanteric fracture femur with dynamic hip screw using 32mm threaded lag screw is likely to reduce the incidence of complications of fix-ation. 32mm threaded lag screws have more bone anchorage in comparison to conventional screws in DHS plate system. Due to more anchorage the chances of screw cut out and neck shaft angle change are less.

PRE OP

IMMEDIATE POST OP



3 MONTHS POST OP

9 MONTHS POST OP

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CASE X-RAYS



PRE OP



IMMEDIATE POST OP