Original Article

# Functional Outcome of Unstable Intertrochanteric femur fracture treated with intramedullary nailing

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## ABSTRACT

**Background:** Femoral pertrochanteric fracture is one of the most frequently occurring fractures in the elderly, usually following trivial trauma. In the younger age group of people, it occurs almost always due to high velocity trauma.

**Objectives:** This study aimed to study the functional outcome of operative management of unstable intertrochanteric fracture treated by intra medullary nailing. The results have been studied in depth with a view to outline guideline for better management of this fracture.

**Material & Methods:** A prospective study of 75 cases of unstable intertrochanteric femur fracture treated by intra medullary nailing, minimum 6 months of follow up. All cases are evaluated according to Modified Harris Hip Score on residual effects on clinical ground at final examination. Pain & functional capacity are the two basic considerations for this scoring system. Points are given for pain, function, range of motion & absence of deformity.

**Result:** Functional result according to Modified Harris Hip score was found to be excellent in 43(57.33%) patients, good in 19(25.33%) patients, fair in 3(44%) patients & poor in 10(13.33%) patients. poor outcome occurs due to development of complications and old age & medical illness.

**Conclusion**:
Modified Harris Hip Score is good score to evaluate functional outcome of the unstable intertrochanteric fracture treated with intramedullary nailing. Unstable intertrochanteric fracture treated with intramedullary nailing gives Excellent to Good (82.66%) functional results.

**Key words:** Unstable intertrochanteric fracture, Modified Harris Hip score, Proximal Femoral Nail.

## INTRODUCTION

Femoral pertrochanteric fractures [1] are one of the most frequently occurring fractures in the elderly, usually following trivial trauma. In the younger age group of people, in whom it is uncommon, it occurs almost always due to high velocity trauma. 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.

This thesis is an attempt to study the long term results of operative management of unstable intertrochanteric fractures by Intra medullary nailing in a standardized and objective manner. Factors affecting the quality of fixation and hence patients ambulation have been analyzed. A form of pre-operative assessment and final assessment has been used. The results have been studied in depth with a view to outline guidelines for better management of these fractures.

Unstable intertrochanteric fracture [2-3] include:-

- 3-fragment fracture with postero-medial communition
- Fracture >2 intermediate fragments(lateral wall blow out)
- Reverse oblique fracture
- Transverse oblique fracture
- Intertrochanteric fracture with subtrochanteric extension

## MATERIALS AND METHODS

**Study area, duration:** A prospective, all inclusive, non-controlled, non-randomized, non-blinded study

of 75 cases of unstable intertrochanteric femur fracture, treated by Intra medullary nailing was done from July 2013 to November 2015 at Shri M.P.Shah Government Medical College & Guru Govindsinh Government Hospital, Jamnagar, Gujarat, India.

**Inclusion criteria:**

- All unstable types of fracture pattern AO/OTA type 31A2.2 to 31A3.3[4]
- Age between 18 - 90 years.
- Men and women both included in study.
- Patient undergoing Primary or Index surgery.
- Different mode of injuries i.e. fall from standing height, slippage, road traffic accident, fall from height are included.
- Patients who survives minimum 6 months after operation are included

**Exclusion criteria**

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

**Preoperaively:**

Radiological confirmation of the diagnosis was carried out by taking anterior-posterior x-rays of hip and the fractures were classified according to AO/OTA Classification [4], UNSTABLE varieties include 31A2.2 to 31A3.3.

**Intraoperatively:**

Intertrochanteric fractures were treated by closed reduction on a fracture table and internal fixation using a proximal femoral nail (PFN) [5-6] / Sirus femoral nail (SFN) inserted under radiographic control.

All the fractures were operated using proximal femoral nail(PFN)[7][8] basic design invented by AO having 8 mm lag screw, 6.4 mm derotation neck screw, 4.9 mm distal interlocking bolts & Sirus femur nail (SFN) having 6.4mm lag screw, 6.4 mm derotation screw ,4.9 mm proximal & distal interlocking bolts .

**Post operative regimen:**

Parenteral antibiotics, usually third generation cephalosporin were started immediately after the admission and postoperatively. Static quadriceps exercises were encouraged from the first day and the knee was mobilized from the third day.

Check x-rays were taken on the same day as soon as patient was stabilized following the surgery.

Simultaneously active hip and knee strengthening exercises are also started. The stitches are removed on 12th post operative day.

Patients were first followed up usually at stitch removal if not already done or at one and a half months after discharge, if stitch removal is already done. Clinical assessment of fracture union, range of movement of hip and knee and radiological assessment of fracture union is done on subsequent follow up. If union is found satisfactory and radiological union is found to be in progress, partial weight bearing is started as tolerated. Patients are next called after another 1&1/2 months and reassessment, both clinical as well as radiological, is done and if union is found to be progressing satisfactorily full weight bearing is started as tolerated. Patients are next called at every 3 months and reassessment, both clinical as well as radiological is done. Functional outcome assessed using Modified Harris Hip Score [9].

**Ethical consent:** Ethical clearance was taken from the institutional committee

**RESULTS**

**Table -1: Distribution of cases according to age**

| Age in years | No. of patients (%, n=75) |
|---|---|
| **18-30** | 05 (6.67%) |
| **31-40** | 09(12%) |
| **41-50** | 07(9.33%) |
| **51-60** | 13(17.33%) |
| **61-70** | 25(33.33%) |
| **71-80** | 12(16%) |
| **81-90** | 04(5.33%) |
| **Total** | 75(100%) |

**Table -2: Distribution of cases according to sex**

| Sex | No. of patients (%, n=75) |
|---|---|
| **Male** | 49(65.33%) |
| **Female** | 26(34.67%) |
| **Total** | 75(100%) |

**Table -3: Distribution of cases according to type of fracture (AO/ASIF)**

| Fracture type | Number of Patients (%, n=75) |
|---|---|
| **A2.2** | 40(53.33%) |
| **A2.3** | 12(16%) |
| **A3.1** | 06(8%) |
| **A3.2** | 01(1.33%) |
| **A3.3** | 16(21.33%) |
| **Total** | 75(100%) |

**Table -4: Distribution of cases according to starting of partial weight bearing**

| Duration in weeks | No. of Patients (%, n=75) |
|---|---|
| **<3** | 01(1.33%) |
| **3-6** | 48(64%) |
| **7-12** | 25(33.33%) |
| **>12** | 01(1.33%) |
| **Total** | 75(100%) |

**Table -5: Distribution of cases according to starting of full weight bearing**

| Duration in weeks | No. of Patients (%, n=75) |
|---|---|
| **<6** | 01(1.33%) |
| **6-12** | 44(58.66%) |
| **13-18** | 20(26.67%) |
| **> 18** | 06(08%) |
| **Not able to full weight bearing** | 04(5.33%) |
| **Total** | 75(100%) |

**Table -6: Distribution of cases according to functional results in present study: surgeon's assessment (ACCORDING TO HARRIS HIP SCORE)**

| Clinical results | Total points | No. of Patients (%, n=75) |
|---|---|---|
| **Excellent** | 81-100 | 43 (57.33%) |
| **Good** | 61-80 | 19 (25.33%) |
| **Fair** | 41-60 | 03 (4%) |
| **Poor** | <40 | 10 (13.33%) |
| **Total** | | 75 (100%) |

## OBSERVATION & DISCUSSION

In current study highest number of patients, 25(33.33%) patients are in 61-70 years age group. A comparative study done by Christian Boldin et al [10] shows highest numbers of patients are in 61-70 years age group.

In this study Male patients slightly predominated with a ratio of Male: Female 1.9:1. A comparative study done by Christian Boldin et al [10] also shows male patients predominated with a ratio of Male: Female 2.3:1.

AO classification was used in this study; A2.2 was the most common fracture type in 40(53.33%) patients, followed by A3.3, A2.3 & A3.1. A Study done by B. Schipper et al [11] shows most common fracture type is A2.2 followed by A2.3, A3.3 and A3.1.

All the patients are followed up closely and at least for 6 months.

49(66%) patients were allowed to partial weight bear within 6 weeks of surgery, while 26(34%) patients after 6 weeks of surgery. 1 patients (1.33%) started partial weight bearing in <3 weeks against medical advice . 26(34.66%) patients were started partial weight bearing after 7 weeks of surgery. Reasons for delayed partial weight bearing are old age, medical illness, psychiatric illness & not following advice properly. A Comparative study done by Christian Boldin et al [10] shows in most of the patients partial weight bearing started on the 2$^{nd}$ post operative day.

45 (60.00%) patients were allowed full weight bearing within 12 weeks after surgery, whereas in 26(34.67 %) patients were allowed full weight bearing after 12 weeks of surgery. These patients were allowed delayed full weight bearing because of old age, having medical illness, psychiatric illness, not following advice properly. 4 patients were not able to walk, out of them 2 patients due to implant failure (nail broken), 1 patient due to severe medical illness and 1 patient due to non union. A comparative study done by Christian Boldin et al[10] shows in most the patients full weight bearing started after 11 weeks.

All cases are evaluated according to modified Harris hip score on residual effects on clinical grounds at final examination.

Pain and functional capacity are the two basic considerations for this scoring system. Points are given for pain, function, range of motion and absence of deformity.

Based on all the above criteria the functional result according to Modified Harris Hip Score was found to be excellent in 43(57.33%) patients, good in 19(25.33%) patients, fair in 3(4%) patients and poor in 10(13.33%) patients. Poor outcome occurs due to development of complications and old age and medical illness.

So in this study unstable intertrochanteric fracture treaded with intramedullary nailing gives modified Harris hip score Excellent to Good in 82.66% patients. A comparative study done by Christian Boldin et al [10] shows Modified Harris Hip Score

was found excellent to good in 75% patients. .A comparative study done by B Schipper et al [11] shows Modified Harris Hip Score was found excellent to good in 77.6% patients.

## CONCLUSION

Modified Harris Hip score is good score to evaluate functional outcome of the patients. In conclusion the Intra medullary nail, is an optimum implant for the internal fixation of unstable intertrochanteric fractures with advantages of stable fixation, early load sharing fixation, early weight bearing and ambulation, shortened hospital stay and improved rate of union with early resumption of independent life style, excellent functional outcome.

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