

# A Study of Management of Unstable Intertrochanteric Fractures and Basal Fractures of Neck of Femur in Elderly by Hemi-arthroplasty.

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## ABSTRACT

**Background:** Fractures of neck of femur are a major cause of morbidity and mortality in elderly population. Intertrochanteric fractures in elderly people are usually comminuted and unstable because of osteoporosis. Unstable intertrochanteric fractures in elderly patients are associated with high rates of morbidity and mortality<sup>2</sup> although the results have improved with the use of Bipolar Hemi-Arthroplasty. **Methods:** All the patients were selected from among the admissions in the Department of Orthopaedics, MNR Medical college and hospital, Medicit institute of medical sciences, Archana hospital, Hyderabad, from June 2013 to 2015 May. Cemented bipolar hemiarthroplasty (Non modular bipolar hip prosthesis of OSIM) with or without greater and lesser trochanter fixation by tension band wiring was done. The follow up was carried out at 6 weeks, 3 months, 6 months, and 1 year. The results were evaluated using Harris Hip Score Rating. **Results:** The average age of patients in our series was 65 years with a range of 60 years to 75 years. Out of 70 patients 42 (60%) were female and 28 (40%) male. Left side is more commonly involved with 38 patients (54%) than right side (46%). The average duration of hospital stay was 10 days, with a range of 10-25 days. Out of 70 patients 35 (50%) had excellent outcome, 14(20%), 14(20%), 7(10%), had good fair and poor outcomes respectively. **Conclusion:** Cemented bipolar hemi-arthroplasty with anatomical reconstruction of trochanteric region preserves abductor mechanism thus allowing early mobilization, safe early weight bearing on the injured hip and had a relatively low rate of complications.

**Keywords:** Bipolar Hemi-arthroplasty, Inter-trochanteric Fracture, Neck of Femur.

## INTRODUCTION

Fractures of neck of femur are a major cause of morbidity and mortality in elderly population. The incidence of all hip fractures is approximately 80 per 100,000 persons. Intertrochanteric fracture make up 45% of all hip fractures.<sup>[1]</sup>

Intertrochanteric fractures in elderly people are usually comminuted and unstable because of osteoporosis. Unstable intertrochanteric fractures in elderly patients are associated with high rates of morbidity and mortality<sup>[2]</sup> although the results have improved with the use of internal fixation. In these patients however, comminution, osteoporosis, and instability often preclude early resumption of full weight bearing.<sup>[3]</sup> Treatment with hemi-arthroplasty rather than internal fixation could perhaps return these patients to their pre injury level of activity more quickly, thus obviating the postoperative complications cause by immobilization or failure of the implant.<sup>[4]</sup>

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Open reduction and internal fixation results in excessive sliding of these fixation devices when used in osteoporotic, comminuted unstable intertrochanteric fractures leading to loss of fixation with

development of unacceptable shortening, external rotation and coxa vara, medial migration of femoral shaft with penetration of screw across the hip joint, disengagement of screw from barrel plate and wandering of screw ultimately resulting in implant failure.<sup>[5]</sup>

Most of the elderly patients treated with various modalities of fixation devices presented with moderate to severe collapse at the fracture with poor functional outcomes in terms of performing daily activities.

Elderly patients often are unable to cooperate with partial weight bearing, or if allowed full weight bearing, voluntarily limit loading of the injured limb.<sup>[6]</sup> To allow immediate postoperative full weight bearing and to avoid excessive collapse at the fracture site, calcar sparing prosthetic replacements for unstable intertrochanteric and basal fractures is recommended. The purpose of our study is to determine if hemi-arthroplasty using a standard femoral stem is a reasonable alternative to reduction and fixation with other devices (sliding hip screws, medoff plate, PFN, etc) for elderly patients in unstable intertrochanteric and basal fractures to reduce mortality and morbidity in term of early weight bearing, pressure sore, pulmonary complication and deep vein thrombosis associated with long rehabilitation.<sup>[7]</sup>

Intertrochanteric and basal fractures of femoral neck, are commonly encountered in the practice of Orthopaedic Surgery. Elderly age groups are often involved. Intertrochanteric and basal fractures occur in patients over 60 years of age commonly and are three times more frequent in women than men

because women tend to be less active and develop postmenopausal osteoporosis. Severe osteoporosis in these patients is responsible for high incidence of trochanteric fractures with minimal to moderate trauma.<sup>[8]</sup>

Surgery in Trochanteric and basal fractures is important in elderly patients for prevention of complications like pressure sores, pulmonary infections, atelectasis, mal-union etc, and aimed at early rehabilitation and mobilization. Internal fixation does provide immediate fracture fixation but usually in elderly patients with osteoporotic bones, complications like loosening, implant penetration, loss of fixation, cut through of implant prevent mobilization and weight bearing leading to complications of recumbence.<sup>[9]</sup>

The aim of the present study is to evaluate to efficacy of bipolar hemi-arthroplasty in intertrochanteric and basal fractures in elderly and to assess the scope of surgery in minimizing the perioperative complications that arise when internal fixation was done.

### MATERIALS AND METHODS

All the patients were selected from among the admissions in the Department of Orthopaedics, MNR Medical college and hospital, Mediciiti institute of medical sciences, Archana hospital, Hyderabad, from June 2013 to 2015 May. Upon admission all patients were investigated.

Out of 52 patients in our study, 2 patients died within 2 weeks after surgery due to unrelated causes. Out of 36 patients who were followed, 32 were women and 18 were men, reviewed for clinical and radiological examination by using the Harri's Hip Score\_at regular intervals 6 weeks, 3 months, 6 months and 1 year after the surgery.

Once the patient is admitted thorough physical examination is done to rule out other injuries, vital data was recorded and the fracture was temporarily immobilized using a below knee skin traction to which a weight of about 3kg was applied.

<b>Fair</b>	Harris Hip Score between 70 & 80
<b>Good</b>	Harris Hip Score between 80 & 90
<b>Excellent</b>	Harris Hip Score 90 and above

### RESULTS

It is a non-randomized prospective study conducted at MNR Medical college and hospital, Mediciiti institute of medical sciences, Archana hospital, Hyderabad, where 50 cases of comminuted intertrochanteric fractures and 20 basal fractures in elderly osteoporotic patients were studied. The

**Table 1:** Distribution of patients on the basis of age.

Age group (years)	No. of Patients (n)	Percentage
60-65	48	69%
66-70	20	29%
71-75	2	2%

The patients were counseled and consent taken for participation in the study. They were informed all the possible complication that can happen during or as a result of surgery prior to their giving unconditional consent.

All the basic investigations and pre-anesthetic check-up were done.

All surgeries were performed in the elective theatre using standard aseptic precautions. Posterior approach or Osborne approach was used. Cemented bipolar hemiarthroplasty (Non modular bipolar hip prosthesis of OSIM) with or without greater and lesser trochanter fixation by tension band wiring was done [Figure 1]



**Figure 1:** Non modular bipolar hip prosthesis

A post-operative check X-ray taken and the Valgus seating with 10-15 degree of ante version was confirmed. Any limb length discrepancy was noted. Knee flexion isotonic quadriceps exercises were started from 2<sup>nd</sup> post op day and patients were mobilized with walker with partial weight bearing and tolerated and if patients are comfortably walking, patient discharged on 6<sup>th</sup> or 7<sup>th</sup> post-operative day and advised them to come for suture removal on 10<sup>th</sup> post-operative day, provided wound is healthy, otherwise pt discharged after suture removal. The follow up was carried out at 6 weeks, 3 months, 6 months, and 1 year. The results were evaluated using Harris Hip Score Rating.

average age of patients in our series was 65 years with a range of 60 years to 75 years [Table 1]. Out of 70 patients 42 (60%) female and 28 (40%) male [Table 2]. Female predominance due to post-menopausal osteoporosis and decrease activity than males in elderly age group. Left side is more commonly involved in our study with 38 patients (54%) than right side (46%) [Table 3].

**Table 2:** Distribution of patients on basis of sex.

Sex	No. of Patients	Percentage
Male	28	40%
Female	42	60%

**Table 3:** Distribution on basis of side involvement.

Side Involved	No. of Patients	Percentage
Left	38	54%
Right	32	46%

In our study commonest mode of inter-trochanteric and basal fractures was due to trivial fall, while walking inside and outside the house which include 26 patients and fall from stairs which include 13 patients [Table 4]. This probably due to severe osteoporosis in elderly decreased vision in elderly and lack of co-ordination and reaction time. The

average duration of hospital stay was 10 days, with a range of 10-25 days [Table 5]. In our study out of 70 patients 35 (50%) had excellent outcome, 14(20%), 14(20%), 7(10%), had good fair and poor outcomes respectively. The average hip score for all the patients in our study was 85.6 + SD 10.5 9 (range 56 to 96) [Table 6].

**Table 4:** Distribution of patients on basis of mode of injury.

Mode of Injury	No. of Patients	Percentage
Fall on Slippery Floor	28	40%
Fall from Cycle	7	10%
Fall from Stairs	21	30%
RTA	7	10%
Miscellaneous	7	10%

**Table 5:** Distribution of patients on the basis of hospital stay.

Duration in days	No. of patients	Percentage
10-15 days	42	60%
15-20 days	14	20%
>21 days	14	20%

**Table 6:** Outcome of patients.

Head Size	Outcome	No. of Patients	Percentage
>90	Excellent	42	60%
80-90	Good	14	20%
70-80	Fair	7	10%
<70	Good	7	10%

## DISCUSSION

In our study all 50 patients had comminuted Intertrochanteric fractures of proximal femur, 19 patients had basal fracture neck of femur and one patient with cervico-trochanteric fracture with severe osteoporosis, SINGHS INDEX <4, aged above 60 years. The fracture was treated with cemented bipolar hemi-arthroplasty with or without reconstruction of greater and lesser trochanter with Tension Band Wiring. The study was conducted over a period of 2 years from June 2013 to May 2015. The concept of dual bearing surfaces offers considerable advantages. It results in sharing of motion at the two surfaces and hence reduction of net wear at either surface, thus reducing erosion at the acetabulum.

So we preferred cemented bipolar hemiarthroplasty for the treatment of unstable intertrochanteric fractures and basal fractures in the elderly in order to decrease complications. Outcome was evaluated with HARRIS HIP SCORE in our study, 88% good

and excellent results were noted comparable to other studies conducted by Rosenfeld et al.<sup>[10]</sup> 49 used arthroplasty and reported 86% satisfactory results in the early period. Sternand Angerman reported 94% good and excellent result after a mean follow-up period of 8 months. Haentjens et al.<sup>[11]</sup> compared the clinical results of internal fixation and bipolar arthroplasty for unstable trochanteric fractures and reported 75% satisfactory results and less postoperative complications in the latter group. They insisted that early weight bearing was the major factor responsible for decreasing postoperative complications. K.casey Chan<sup>[12]</sup> found that use of standard cemented hemiarthroplasty is a reasonable alternative to a sliding screw device for the treatment of intertrochanteric fractures to achieve less postoperative complication. Chris Grimsrux and Raul J. Monzon<sup>[13]</sup> treated all unstable three and four part hip fractures with standard femoral stem and circlage cabling of trochanters and they conclude that bipolar arthroplasty allows safe

early weight bearing on the injured hip and had a relatively low rate of complications.

The average age in our series was 65 years with a range of 60-75 years. The average age in the reported series is as follows: Casey MD series 2000 was 84.2 years and Heidelberg 2002 was 75.6 years. The age incidence in our series is a lower side probably due to malnutrition, early onset of senile osteoporosis in our country. The average life expectancy of an Indian is 10 years less than western standards. Majority of our older individuals in our country are mobile and active when compared to western countries and so are at risk of fall and fractures.

In our series, it was observed that the male to female ratio was 28.42 the female being 60%. The sex incidence in our series is almost similar to the reported series. According to Long and knight<sup>[14]</sup> 1980 females were 65.38%. In our study the Intertrochanteric fractures are common in elderly female (64%) due to hormonal imbalance in post-menopausal age and associated osteoporosis is due to poor hormonal replacement therapy and malnutrition in our country.

## CONCLUSION

Elderly patients over 60 years of age with comminuted intertrochanteric fractures and basal fractures from a special group with special problems. Cemented bipolar hemi-arthroplasty with anatomical reconstruction of trochanteric region preserves abductor mechanism thus allowing early mobilization, safe early weight bearing on the injured hip and had a relatively low rate of complications. The advantages of hemi-arthroplasty over internal fixation of comminuted intertrochanteric fractures in elderly people can be made use of in bringing down the morbidity and post-operative complications.

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