



# TO STUDY THE EPIDEMIOLOGY AND FUNCTIONAL OUTCOME OF PRIMARY BIPOLAR ARTHROPLASTY OR TOTAL HIP ARTHROPLASTY FOR TREATMENT OF OSTEOPOROTIC AND UNSTABLE INTERTROCHANTERIC FEMUR FRACTURE IN ELDERLY.

## Orthopaedics

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## ABSTRACT

**BACKGROUND:** Intertrochanteric femur is common fracture in elderly people. Their incidence has been increased due to the increased life expectancy and osteoporosis. **AIM:** To Study the Epidemiology and functional outcome of Primary Bipolar Arthroplasty or Total Hip Arthroplasty for treatment of Osteoporotic and Unstable Intertrochanteric Femur Fracture in elderly. **RESULTS:** In our study of 30 cases of osteoporotic and unstable intertrochanteric femur fractures, 21 cases were treated with primary cemented bipolar hemiarthroplasty and 9 cases were treated with primary cemented total hip arthroplasty. Evan's classification of Intertrochanteric fractures was used. Mean age in the study was 73.90 years. Male to female ratio was 1.14:1. Out of 30 cases, 53.33% had left and 46.67% had right sided fracture. Major mode of trauma is trivial trauma / fall. Based on the Harris Hip Score, overall 36.67% had excellent, 50.00% had good and 13.33% had fair results at six months. In the hemiarthroplasty group, 38.09% had excellent, 47.62% had good and 14.28% had fair results at six months. However in the THA group 33.33% had excellent, 55.55% had good and 11.11% had fair results at six months of follow up. 28 out of 30 patients start weight bearing within 1 week of surgery. **CONCLUSION:** Primary Bipolar Arthroplasty or Total Hip Arthroplasty for treatment of Osteoporotic and Unstable Intertrochanteric Femur Fracture, is an excellent and viable modality of treatment in unstable osteoporotic intertrochanteric femur fractures in elderly. It gives painfree, stable and mobile hip joint early in post operative period. This procedure is suitable and acceptable alternative to internal fixation in elderly with relatively low rate of complications.

## KEYWORDS

Intertrochanteric femur fracture, Elderly, Bipolar, Total hip Arthroplasty

## INTRODUCTION

Intertrochanteric femur is common fracture in elderly people<sup>1,2</sup>. Their incidence has been increased due to the increased life expectancy and osteoporosis.<sup>1,2,3</sup> There were an estimated 1.66 million hip fractures worldwide in 1990. This worldwide annual number is rising rapidly with an expected incidence of 6.26 million by the year 2050.

Ninety percent of Intertrochanteric fractures in the elderly result from a simple fall,<sup>17,18</sup> which in village based community occurs while walking on uneven road surfaces while in urban population is due to self fall. Osteoporosis and instability are the most important factors leading to unsatisfactory results.<sup>1,2,3</sup>

In internal fixation for unstable fractures, a period of restricted immobilization is suggested, which may lead to complications such as atelectasis, bed sores, pneumonia and deep vein thrombosis<sup>4,5</sup>. Despite advances in internal fixation techniques, the failure rate of the dynamic hip screw is 6.8% to 9.8 & proximal femoral nail is between 7.1% and 12.5% in unstable fractures. There have been various reports of successful outcomes after the use of hemiarthroplasty and total hip arthroplasty (THA)<sup>6</sup>. These arthroplasty have also been shown to achieve early rehabilitation of the patient and good long-term result<sup>7,8,9</sup>.

Many authors have reported that primary cemented arthroplasty brought better results than compression hip screw in unstable intertrochanteric fractures in elderly osteoporotic patients who were eligible for early mobilization.<sup>10</sup>

Hence, the purpose of our study is to assess the epidemiology and functional outcome of primary cemented bipolar hemiarthroplasty and primary cemented total hip arthroplasty in unstable intertrochanteric femur fractures in elderly osteoporotic patients. Harris hip score was used to evaluate the functional outcome of this study.

## MATERIAL AND METHODS

This prospective study conducted in the Department of Orthopaedics of a Tertiary care hospital over a period of 18 months. All the patients with Osteoporotic and Unstable Intertrochanteric Femur Fracture of Elderly were screened using inclusion and exclusion criteria. Informed consent was taken and approval of the Institutional Review Board was obtained prior to the commencement of the study.

## Inclusion Criteria:

1) Closed Osteoporotic Unstable Intertrochanteric Femur Fracture

- 2) Patient Age  $\geq 55$  Years
- 3) Monotrauma or polytrauma
- 4) Medically fit for surgery.

## Exclusion Criteria:

- 1) Open fractures
- 2) Fractures due to malignancy
- 3) Medical contraindication to surgery
- 4) Patients less than 55 years of age
- 5) Distal neurovascular deficit
- 6) Patient with signs of Infections

## METHODOLOGY-

The detailed history was taken in form of chief complaints, mode of trauma, onset, duration and progress of the complaints & past history. Radiographic Investigations were done in the form of Pelvis with both hips AP view in traction and 15° Internal Rotation and affected hip lateral view were evaluated. Fractures were classified based on the Evan's classification.

Skin traction were applied preoperatively. Surgery for the primary unstable trochanteric fracture was done by cemented bipolar hemiarthroplasty or cemented total hip arthroplasty. Post-operative radiological examination were done. Patients will be followed on 1st, 2nd, 3rd, and 6th months and clinically evaluated by using modified Harris hip score.

## Operative Procedure-

After Epidural anaesthesia, patient was placed in lateral position on the operating table. This study include both procedure total hip arthroplasty and hemiarthroplasty. So, for each case, surgical steps were individualized based on the requirement of surgical procedure. But, the standard protocols were followed. Anterolateral (Watson Jones) approach were used.

Longitudinal incision was taken from the tip of greater trochanter (GT) and extended distally towards the femur shaft. Gluteus medius and minimus were found and retracted laterally. Vastus lateralis muscle incised from its origin ridge. After cutting vastus lateralis, capsule exposed. Inverted T shaped cut was made on the capsule. Now, head of femur dislocated anteriorly and was levered out of the acetabulum. Size of head of femur was majored using template. Now, here in this study 2 different operative procedure had been performed.

In Hemiarthroplasty, broaching and Reaming of femur done using

graduated sized reamers to enlarge the canal sufficiently for insertion of Antibiotic impregnated bone cement and femoral stem. In some cases, Stainless steel wire was passed in the proximal femur, which was used for subsequent reattachment of greater trochanter and another stainless steel circlage wire was passed near the lesser trochanter for the subsequent fixation of the medial side of the femoral component. Reconstruction of calcar near lesser trochanter was done by using extracted head and medial part of neck. Medial hard, strong and stout part of neck was cut using orthopaedic oscillatory saw, osteotome and hammer, remaining muscle attachment removed and the cut part was shaped in such a fashion to fit postero medially on behalf of calcar.

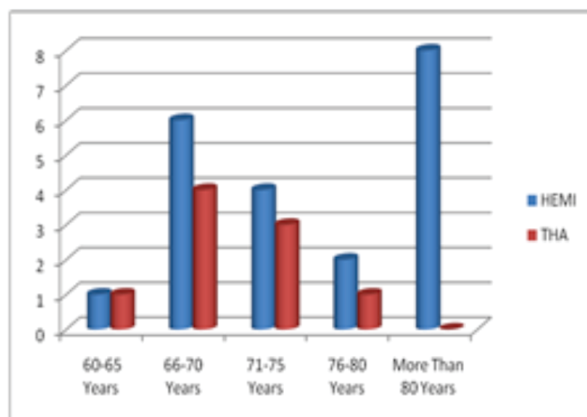
In Total Hip Arthroplasty, after removal of head reaming of acetabulum and femoral canal done. Appropriate size acetabular cup, femoral stem and Head placed and cementing. During this, again the Greater and lesser trochanter reconstructed using Stainless steel wire and femur head.

Incised muscles like gluteus medius, vastus lateralis and tensor fascia lata approximated to each other. Tight closure of this layer helps us to stabilize the hip and may prevent a superficial inflammatory process from extending to a deeper level<sup>16,17</sup>. Closure was done in layers and abduction pillows were used to keep the hip in 30 degrees of abduction.

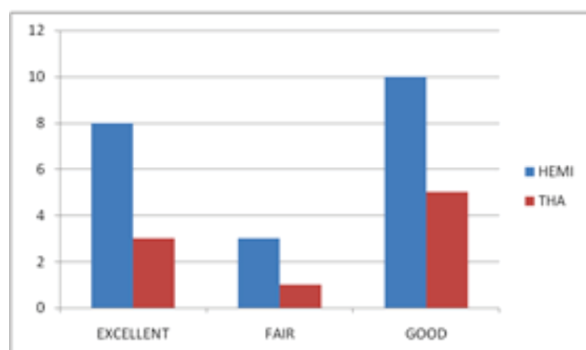
## RESULTS

In our study of 30 cases of osteoporotic and unstable intertrochanteric femur fractures, 21 cases were treated with primary cemented bipolar hemiarthroplasty and 9 cases were treated with primary cemented total hip arthroplasty. Evan's classification of Intertrochanteric fractures was used. 11(36.66%) patients were categorised as Type 1c while 19(63.34%) patients had Evan's type 1d fracture. Mean age in the study was 73.90 years. Male to female ratio was 1.14:1. Out of 30 cases, 53.33% had left and 46.67% had right sided fracture. Major mode of trauma is trivial trauma / fall, in 90.00% of cases. Based on the Harris Hip Score, overall 36.67% had excellent, 50.00% had good and 13.33% had fair results at six months. In the hemiarthroplasty group, 38.09% had excellent, 47.62% had good and 14.28% had fair results at six months. However in the THA group 33.33% had excellent, 55.55% had good and 11.11% had fair results at six months of follow up. 28 out of 30 patients start weight bearing within 1 week of surgery. No mortality found in this study of 6 months follow up.

GRAPH NUMBER 1 : AGE GROUP IN YEARS.



GRAPH NUMBER 20 : HARRIS HP SCORE AT 6 MONTH FOLLOWUP



Pre Operative X Ray



Post Operative X ray



Pre Operative X-ray



Post Operative X-ray



Immediate Post Operative Weight Bearing With Support



Weight Bearing Without Support

## DISCUSSION

30 cases of osteoporotic and unstable intertrochanteric femur fractures, included in our study treated with primary cemented bipolar hemiarthroplasty and primary cemented total hip arthroplasty. Based on the Harris Hip Score, out of 30 patients, overall 11 patients had excellent, 15 had good and 4 had fair results at six months.

In Sancheti et al<sup>7</sup> study a total of 32 out of 35 patients (91%) had excellent to fair functional outcome and 2 had poor outcome according to the Harris hip score. The mean HHS was 76.8 in the THA group and 74.6 in the Bipolar group in Lihong et al<sup>13</sup> study. In Amarjit S et al<sup>11</sup> study Harris hip score at three months  $72 \pm 6$  and at one year  $74 \pm 5$ . The mean HHS at the end of 3 months was 69.60 in Atul P et al<sup>14</sup>. Rodop. O et al<sup>15</sup> observed 17 excellent and 14 good results after 1 year of follow up.

Cemented bipolar hemiarthroplasty and total hip arthroplasty in unstable osteoporotic intertrochanteric femur fracture in elderly provide good stable fixation and patient can bear weight immediately after operation. This reduces the morbidity and complications related to old age and prolonged immobilisation.<sup>7,11,12,13</sup> Early weight bearing following internal fixation of comminuted intertrochanteric femur

fractures by various means in elderly and osteoporotic patients leads to fixation failure and poor results<sup>33</sup>.

Initially prosthesis placement used only in the management of failed fixation of intertrochanteric femur fractures but now hemiarthroplasty and total hip arthroplasty used as a primary treatment modality in osteoporotic unstable intertrochanteric fracture in elderly. And this is suggested by many studies.

Amarjit S et al<sup>11</sup> conducted a series of 53 patients with A2.2 and A2.3 intertrochanteric fracture were treated with total hip replacement. They concluded that total hip arthroplasty is a valid treatment option for mobile and mentally healthy elderly patients with intertrochanteric fractures. This procedure offers quick recovery, avoids the risks associated with internal fixation.

Chandra P P<sup>12</sup> et al conducted a study in which, 12 patients were operated by bipolar hemiarthroplasty and 6 patients operated by total hip arthroplasty. They concluded that bipolar hemiarthroplasty and THA for intertrochanteric fracture in elderly patient results in early ambulation and good functional outcome.

Lihong Fan<sup>13</sup> et al conducted a study to compare bipolar hemiarthroplasty (BA) with total hip arthroplasty (THA), in the treatment of unstable intertrochanteric fractures in elderly osteoporotic patients. They concluded that, BA, compared with THA, has the advantages of less complexity, shorter operation time, less blood loss, lower cost and a lower probability of dislocation. However, groin pain and thigh pain due to acetabular erosion, in BA group reduces long-term survival and increases the likelihood of a second operation. In their study they found no significant difference between THA and BA group in surgery outcome, revision rate, mortality rate and general complications.

## CONCLUSION

Primary Bipolar Arthroplasty or Total Hip Arthroplasty for treatment of Osteoporotic and Unstable Intertrochanteric Femur Fracture, is an excellent and viable modality of treatment in unstable osteoporotic intertrochanteric femur fractures in elderly. It gives painfree, stable and mobile hip joint early in post operative period. Trochanteric reconstruction gives very good functional outcome avoiding abduction lurch. This procedure is suitable and acceptable alternative to internal fixation in elderly and debilitated patient with osteoporotic unstable intertrochanteric fracture with relatively low rate of complications.

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