

## Original Research Article

# Clinical outcome of primary cemented hemiarthroplasty in unstable trochanteric fractures in elderly patients

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### ABSTRACT

**Background:** Management of unstable trochanteric fracture in elderly patients is challenging due to poor bone quality. Fracture stabilization and early mobilization is very important in preventing the complications. Fixation of the fracture with proximal femoral nail and dynamic hip screw has its complication and it takes time to mobilization of the patient after consolidation of fracture. Cemented bipolar hemiarthroplasty in osteoporotic unstable comminuted trochanteric fracture helps in early mobility and reduces complications.

**Methods:** We prospectively analyzed 20 cases of cemented hemiarthroplasty in unstable intertrochanteric fractures. The functional outcomes were assessed based by Harris hip score.

**Results:** The functional outcome measured with Harris hip score is excellent to good in most of the patients.

**Conclusions:** Primary cemented hemiarthroplasty in unstable trochanteric fracture in elderly results in early ambulation with good functional outcome.

**Keywords:** Unstable trochanteric fracture in elderly patients, Cemented hemiarthroplasty, Good functional outcome

### INTRODUCTION

Trochanteric fracture is most common in geriatric population and associated with high incidence of mortality and morbidity. Conservative treatment of this fracture results in decubitus ulcer, joint contractures, pneumonia, urinary tract infection and thromboembolic complications.<sup>1</sup> Fracture healing accompanied by external rotation, varus deformity and shortening because of the inability of traction to effectively counteract the deforming muscular forces.<sup>1</sup> Operative treatment is aimed for fracture reduction and stabilization, which permits early patient mobilization and minimizes the complications. The different methods of osteosynthesis in comminuted trochanteric fractures in elderly patients does not provide fracture stability and bony union, leading to complications like nonunion, implant failure and AVN changes of femoral head.<sup>2,3</sup> To allow early

postoperative weight-bearing and to avoid excessive collapse at the fracture site, some surgeons have recommended prosthetic replacement of the femoral head.<sup>4-6</sup> So patients treated with hemiarthroplasty are mobilized aggressively and complication rates get decreased.

### METHODS

The proposed study was conducted in the Department of Orthopaedics, KPC Medical College and Hospital, Kolkata, during the period of February 2015 to July 2016.

#### *Sample design*

Patients with trochanteric fracture with any one of the following:

- Comminuted trochanteric fractures.
- Unstable trochanteric fractures.
- Grossly osteoporotic bone (60yrs and or above) using Singh's index.

**Study design**

- Prospective study

**Parameters studied-**

- Sequential follow up with clinical examinations and radiographic studies.
- Charting of pain in the hip.
- Range of motion of hip.
- Distance that can be walked. Walking with support, or without support.

**Study tools**

- Patient informed consent form.
- Case sheets for relevant history and clinical examination.
- Clinical instruments like measuring tape for measurement of limb length,
- Goniometer for range of motion.
- Harris Hip Score. Roentgenography.

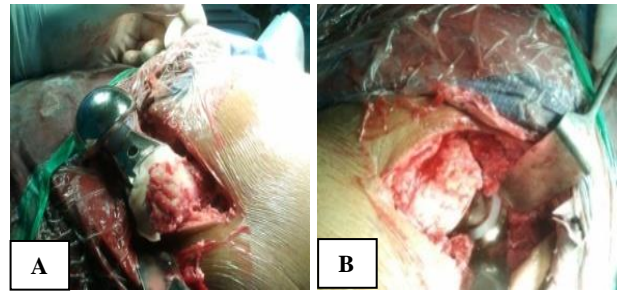
**Procedure**

The ethical approval and patient consent was taken.

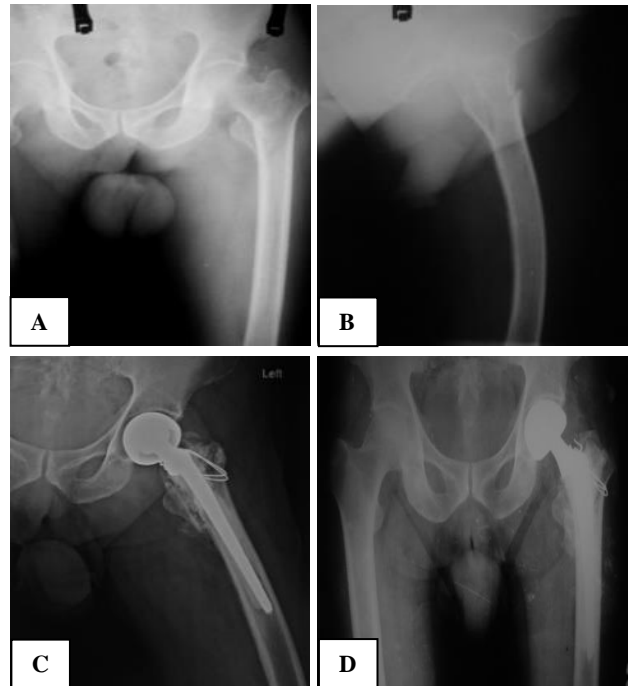
Patients of 60 years or above with unstable trochanteric fractures according to Evans II, AO/OTA type 31-A2.2 and 31-A2.3, fractures were included in this study. Osteoporosis is determined by the gross radiological changes in the pelvis, both hip joints, and the proximal femur using Singh's index. All cases were operated by using a standard posterior approach in lateral position. The fracture anatomy was assessed and a cut was taken high up in the neck (almost subcapital level) to facilitate removal of the femoral head. In 3 cases, the lesser trochanter was in continuity with the neck of the femur and was reconstructed with the shaft and greater trochanter using steel wires (Figure 1).



**Figure 1: Fractured greater trochanter fixed with stainless steel wires.**



**Figure 2: Prosthesis (A) before and (B) after reduction.**



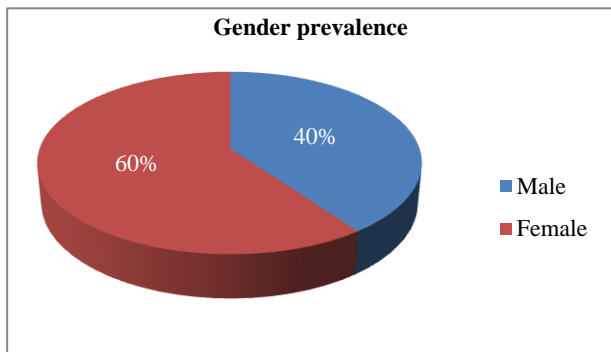
**Figure 3: (A) 72 years old male with unstable variety of intertrochanteric fracture; (B) immediate post-op; (C) AP and (D) lateral view.**

A neck cut was then taken roughly about 1–2 cm above the lesser trochanter depending upon the amount of comminution. At times, both the trochanters were found as a separate fragment; in these cases the lesser trochanter and the greater trochanter were fixed to the shaft using steel wires; however, most of the portion of the neck had to be sacrificed. In 7 cases where the lesser trochanter was comminuted, the trochanter pieces were left attached to the soft tissue and the medial defect was reconstructed using a cement mantle. In 4 cases where the greater trochanter was coronally split, a tension band was applied beneath the gluteus medius tendon and a bony tunnel was drilled in the distal greater trochanter. In some cases, the greater trochanter was found to be severely comminuted; here ethibond sutures were used to suture together the trochanter pieces and the soft tissue to make a stable construct. The gluteus medius, greater trochanter, and the vastus lateralis apparatus were maintained in continuity as a stable lateral sleeve. This was then fixed loosely to

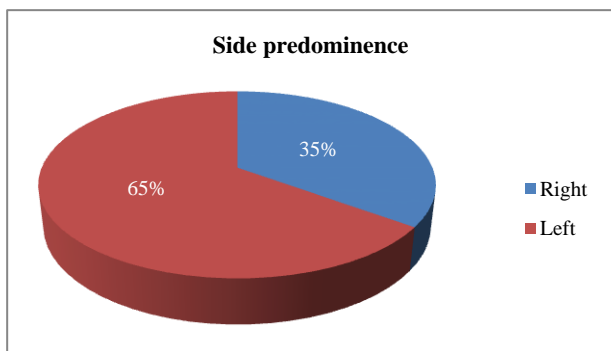
the shaft fragment with steel wires or ethibond sutures. The femoral canal was broached with appropriate anteversion. A fixed bipolar prosthesis was then inserted and trial reduction was done with the leg in longitudinal traction. Manually cement was inserted into the canal and final prosthesis was fixed into the canal (Figure 2). Once the prosthesis was fixed, the fracture fragments were reconstructed and reattached to the shaft. Stability of the prosthesis was checked and all the layers were closed accordingly over a suction drain after achieving hemostasis.

**RESULTS**

20 patients of 60 years and above (average age=71.05) sustaining such fractures underwent this procedure. The male to female ratio was 2:3. 95% of the patients were hypertensive and some patients had other co-morbid conditions like diabetes mellitus and chest disease. All the patients were ambulatory before the operation except 6 patients walking with support due to osteoarthritis of the knee. All patients were operated within 20 days of admission.



**Figure 4: Gender prevalence of trochanteric fracture.**

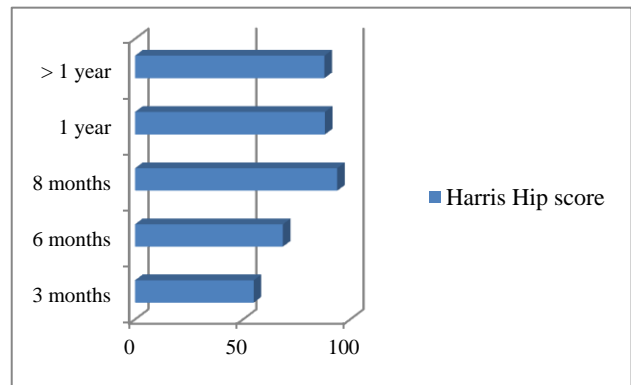


**Figure 5: Side predominance of trochanteric fracture.**

Post operatively 7 patients received one unit of whole blood transfusion in the ward under supervision. The suction drain was removed 24 hours from surgery. All the patients were allowed to sit on the next day of the surgery. Following static exercises, patients were taught and motivated to perform dynamic quadriceps exercises before progressing to ambulation. Proper nursing care

was given with emphasis on postural care, chest physiotherapy and personal hygiene. Weight bearing, as tolerated by the patient, was started with a walker. 2 patients were uncooperative and refused to walk due to psychiatric problems. 6 Patients were able to walk but only with the aid of a walking stick due to preexisting osteoarthritic knee complicated by pain. Ambulation was achieved within an average of 3days. Average hospital stay was 8 days.

3 patients died after their 3rd follow-up visit due to causes which were unknown but unrelated to surgery. The remaining 15 patients had regular follow up. At the end of the 3<sup>rd</sup> visit i.e. 3 months, 5 patients had an excellent result, 7 patients had a good result, 1 patient had a fair result, and 2 patients had a poor result. The mean Harris Hip Score (HHS) was 84.04 (range 55-96). Out of 15 patients, 7 patients walked with the aid of a cane including the 6 patients, who were already walking with the aid of a cane pre-injury state. In the last follow up 5 patients had excellent results, 4 patients had good results, 4 patients died due to unknown reasons but unrelated to surgery and 2 patients did not turn up for their last follow up.



**Figure 6: Postoperative Harris hip score.**

**DISCUSSION**

Domestic fall is most important cause of trochanteric fracture in elderly population. Unsatisfactory surgical outcome is commonly due to coexisting medical illness, osteoporosis, and fracture instability. Early full weight bearing in the hemiarthroplasty group compared with early partial or non-weight-bearing in the internal fixation group was the main reason for significant reduction in postoperative complications such as pressure sores and pulmonary complications.<sup>7-9</sup>

Patients undergoing hemiarthroplasty generally are more elderly and have more medical co-morbidities. The Indian perspective regarding the use of primary arthroplasty as a modality of treatment for comminuted unstable intertrochanteric fractures has been shown by few authors.<sup>10,11</sup> Early mobilization may decrease the risk of mortality and morbidity.<sup>12,13</sup>

In a comparative study between bipolar arthroplasty and internal fixation, arthroplasty group had a lower postoperative complication rate and resulted in earlier weight bearing. There was a significant difference in full weight bearing time between the two groups. Though more costly, bipolar arthroplasty is a treatment option for patients with unstable intertrochanteric fractures, which can achieve earlier mobilization.<sup>14,15</sup> In our study, however, could not give further comments because of small sample size and short duration of follow-up, one of the limitations of this study. Thus in conclusion, primary hemiarthroplasty does provide a stable, pain-free, and mobile joint, however a larger prospective randomized study and longer duration of follow-up will be needed.

## CONCLUSION

Primary cemented hemiarthroplasty as a treatment for unstable trochanteric fractures is a viable option for the elderly population. It results in early mobilization which avoids the hazards of prolonged inactivity and prevents implant failure due to osteoporosis. Hemiarthroplasty decreases chances of complications resulting from prolonged incumbency such as pulmonary embolism, deep vein thrombosis, hypostatic pneumonia, and decubitus ulcer.

Hemiarthroplasty is a better option than internal fixation in the elderly of age taking into consideration their comorbidities and poor bone stock due to osteoporosis, which can jeopardize internal fixation. Given that these fractures usually occur in the elderly, who are less mobile and less demanding, less strain is born by the prosthesis.

Good functional results were obtained by cemented hemiarthroplasty which can therefore be considered as a preferential method for unstable trochanteric fractures in elderly, although further prospective randomized trials are required to support our conclusion.

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