

Outcomes of cemented bipolar hemiarthroplasty in unstable inter trochanteric fractures: A prospective study

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Abstract

Background: Inter trochanteric fractures with severe displacement and comminution are common in elderly patients. These patients have a poor bone quality and fractures are often associated with complications like non union, malunion, femoral head perforation. The primary goal of treatment is stable fixation and immediate full weight bearing mobilization. **Methods:** Patients between 50-70 years of age operated between 2013 -2015, and fulfilled the inclusion criteria were taken in this study. Excessive collapse, loss of fixation and cut out if lag screw, which result in poor function, remain problems associated with internal fixation of unstable inter trochanteric fractures in elderly patients with osteoporotic bones. To allow an earlier post operative weight bearing and rapid healing and to avoid excessive collapse at the fracture site, surgeons have recommended prosthetic replacements for the treatment of unstable inter trochanteric fractures. **Conclusion:** The purpose of this prospective study was to evaluate the functional and clinical outcomes of cemented bipolar hemiarthroplasty as treatment for unstable inter trochanteric fractures in elderly patients.


Key Word: hemiarthroplasty, trochanteric fractures.

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INTRODUCTION

There were an estimated 1.66 million inter trochanteric fractures in 1990. Inter trochanteric fractures are common problem in elderly patients and are associated with high rate of morbidity and mortality. These fractures occur in patients having osteoporosis. They are mainly caused by trivial trauma (mild twist while walking, slip on floor); according to the age group taken in this study (50-70 years), some are caused by road traffic accidents. Inter trochanteric fractures (of type 31-2.2 – type 31-3.3) are mainly considered as unstable fractures, in this fractures mainly excessive collapse, loss of fixation, and cut out of lag screw, which result in poor function, associated with

internal fixation to allow an earlier post operative weight bearing and early rehabilitation and to avoid excessive collapse of the fracture site, thereby reducing mortality and morbidity rates; we have recommended for bipolar prosthesis with cement for treatment of unstable inter trochanteric fractures.

MATERIALS AND METHODS

Between 2013- 2015, a series of 30 patients who underwent cemented bipolar hemiarthroplasty for unstable inter trochanteric fractures those patients age was ranging from 50- 70 years and they had been independently mobile before sustaining fractures. the exclusion criteria was patients having any transcervical, subcapital, and basicervical neck femur fractures and patients having stable inter trochanteric fractures (according to ao classification: ao type 31 a1.1- type 31 a2.1) Proforma included name, age, sex, address, complaints, type of injury, time of surgery, duration of surgery, size of bipolar implant (modular prosthesis, fixed prosthesis), type of cement used, amount of blood loss (intra and post operatively), post operative immobilization follow up period is being taken care by used of harris hip score method, (1week, 2 week, 4 week, 8 week, 12 week) and conclusion. This study was

approved by institution ethics comitee, all the patients provided written consent in the language they understand the best. The operation was performed by using more approach with patients in lateral decubitus position. The femoral head, neck and fractured inter trochanteric region meticulously cut to preserve the integrity of greater trochanter, abductor muscles. The femoral canal was reamed to by canal finder and trial reductions were performed with all small, medium, and large size rasps, careful restoration of the neck length, offset, version to maximize stability of hip joint, was also performed during trial. the femoral canal is then cemented (with or without antibiotic), mainly simplex cement was used and with gentamycin on certain patients randomly by medullary cement plug, hand mixing of cement, use of cement gun

to deliver cement in doughy stage in a retrograde fashion. Any protrusions of cement between reduced bone fragments were removed. The gluteus medius muscle and vastus lateralis muscle were sutured to their anatomical locations, fascia lata was tightly closed over suction drain. post operative radiographs were obtained. The sutures were removed on day 12 and patients were discharged with instructions of do's and don'ts. An unstable inter trochanteric fracture treated with bipolar hemi arthroplasty and greater trochanter reconstruction done with tension band wiring. Patients were ambulated full weight bearing on the first post operative day. They were followed up at 1 week, 2 week, 4 week, 8 week, 12 week. Clinical evaluation was done according to harris hip score.

RESULTS

Table 1: Implant Used

	Frequency	Percent
Fixed	9	30.0
Modular	21	70.0
Total	30	100.0

Table 2: Cement Used

	Frequency	Percent
With Antibiotic	7	23.3
Without Antibiotic	23	76.7
Total	30	100.0



Figure 1: Preoperative and post operative radiographs of right hip of 70 year old female



Figure 2: Preoperative and post operative radiographs of unstable inter trochanteric fracture treated with cemented bipolar hemiarthroplasty

Thirty patients were enrolled in this study; Seventeen patients had a trivial trauma and the rest 13 patients had road traffic accidents. There are 16 female and 14 male patients. female to male ratio is 1.1:1. All 30 patients had an unstable inter trochanteric fractures according to ao classification; a0 312.2- 3.3. The average duration of

surgery was 55-60 minutes in all patients. Type of cement used among 30 patient size in our study, in 23 patients: without antibiotic and the remaining 7 patients: antibiotic cement. The mean day for full weight bearing was 1.2 with help of walker, excellent to fair results were obtained at the final follow up in 27 cases (90%) and in 3

cases (10%) results were poor; post operatively 3 patients (10%) had shortening of less than 2 cm and 1 patient (3.3%) had shortening of more than 2%; and 1 patients had lengthening of 1.5cm. 2 Patients had dislocation rates in the subsequent follow up and 1 patient expired before follow up. patients were followed up at 1 week, 2 week, 4 week, 8 week, 12 week, and the follow up was evaluated by harris hip score. a majority of the patients had a pain free mobile hip with a full range of flexion, abduction and adequate amount of rotation and adduction. In our study, there was incidence of two dislocation of the prosthesis and one patient had expired before follow up. In our final functional result were good according to harris hip score with a mean score of 90%.

DISCUSSION

Complexity of inter trochanteric fractures in elderly osteoporotic patients poses challenging problems with an added risk of increased morbidity and mortality. Although union rates as high as 100% have been reported in association with well reduced, stable fractures that were treated with ideal implant placement, failure rates are high as 56% have been noted in association with unstable fractures, comminutions, sub optimal fractures or poor quality in elderly patients. The poor mechanical properties of the weak and osteoporotic bones in elderly patients do not provide a good purchase for screws, which subsequently lead to early biomechanical failure. This leads to a collapse with migration of the femoral head into the varus and retroversion resulting in limping, which is caused by shortening and decreased abductor lever arm mechanism. Cemented bipolar hemiarthroplasty is a frequently employed alternative as it gives stability and immediate full weight bearing. Many of the complications of internal fixations can be avoided by cemented bipolar hemiarthroplasty. The concept of dual bearing surfaces in prosthesis offers considerable advantages, it results in sharing of the motion at two surfaces and it reduces the net wear at either surface, thus reducing erosion at the acetabular cartilage interface in addition, the total range of motion at the joint surface increases. Cemented fixation is advantageous for achieving the initial implant stability and a rapid rehabilitation. Liang *et al.* in their study which was done on unstable inter trochanteric fracture concluded that cemented bipolar hemiarthroplasty is a safe method for treating unstable inter trochanteric fracture it decreases mortality and morbidity rates. Grimsrud *et al.* studied 39 patients with unstable inter trochanteric patients which are treated with cemented bipolar hemiarthroplasty and concluded that this technique allows early weight bearing and has a low rate of complications Rodop *et al.* had also done studies on the same, and found about 45% excellent

results and 40 % good results after a period of 12 months follow up according to harris hip score. Thus results of this modality of treatment looks promising. Reconstruction of greater trochanter is an important step in surgery for maintaining stability of hip joint primary hemiarthroplasty offers a modality of treatment that provides adequate fixation and early mobilization in these patients thus preventing post operative complications, such as pressure sores. The corner stone of management of such fracture is early surgery followed by mobilization. Early mobilization is very essential particularly with patients with other medical comorbidities and also to prevent post operative complications.

LIMITATIONS

Due to the small sample size and short follow up, it was not possible to do an analysis on mortality in the current study. However most of the complications after hemiarthroplasty are rare. This study also had 30 patients for doing analysis on complication such as dislocations, loosening of the prosthesis, infections.

CONCLUSION

Unstable inter trochanteric fractures are better treated with cemented bipolar hemiarthroplasty, The outcomes of this modality of treatment in the period of said follow up is suggestive about the dominance of this modality, because of the less hospital stay and early ambulation and less complications.

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