

Primary Bipolar Hemiarthroplasty in Unstable Comminuted Intertrochanteric Fractures in Elderly

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ABSTRACT

Aim: Unstable intertrochanteric fracture in elderly is a challenging surgical condition with a high risk of morbidity and mortality. Aim of this study is to evaluate the functional outcome of primary bipolar hemiarthroplasty as an alternative to the standard treatment of Dynamic hip screw fixation in unstable intertrochanteric fractures

Materials and Methods: Thirty one patients with unstable intertrochanteric fractures treated with primary bipolar hemiarthroplasty were prospectively analysed. The functional outcomes were assessed based on Harris hip score.

Results: The time to full weight bearing, the rate of postoperative complication, and the functional outcomes were significantly better in primary bipolar hemiarthroplasty.

Conclusion: Primary bipolar Hemiarthroplasty for unstable intertrochanteric fractures in elderly results in early ambulation, less hospital stay, provide stable hips with good functional results.

Keywords: Unstable intertrochanteric fractures, primary bipolar hemiarthroplasty, osteoporosis, harris hip Score

INTRODUCTION

Unstable comminuted intertrochanteric fracture in elderly is a challenging surgical condition with a high risk of morbidity and mortality.^{[1][2]} Conservative management with traction and prolonged immobilization lands up with many complications. The primary goal of the treatment is a stable fixation and an immediate weight-bearing mobilization.^[3] Stable intertrochanteric fractures treated with standard osteosynthesis, shows good results, whereas the management of unstable comminuted intertrochanteric fractures is challenging, because increased rate of implant failure.

Problems associated with the internal fixation of unstable intertrochanteric fractures in elderly patients with osteoporotic bones are excessive collapse, loss of fixation, and cut out of lag screw. To allow early post-operative weight-bearing, and rapid rehabilitation, few surgeons have recommended hemiarthroplasty for the treatment of unstable intertrochanteric fractures.^{[4][5][6]}

The purpose of this prospective study is to evaluate the functional and clinical outcomes of cemented and uncemented primary bipolar hemiarthroplasty as a primary treatment for unstable intertrochanteric fractures in elderly patients.

MATERIALS AND METHODS

A series of 31 (18 male and 13 female) patients who underwent primary bipolar hemiarthroplasty for unstable comminuted intertrochanteric fractures were followed up prospectively.

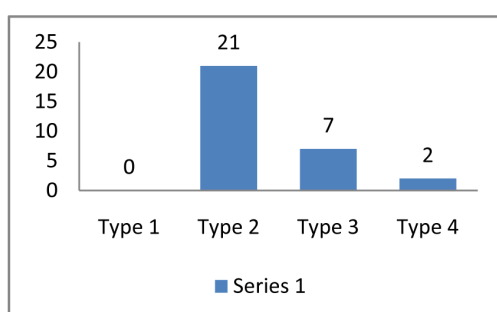
Inclusion Criteria

- Elderly (age more than 65 years)
- Patients co-operative for physiotherapy
- Osteoporotic patients (Singh's index)
- Patients who are able to walk before injury
- Boyd and Griffin Classification (type II, III, IV).

Exclusion Criteria

- Open Intertrochanteric fractures
- Polytrauma patients ...
- Severely moribund patients
- Patients who were < 65 years of age.

Preoperative data included: Age, sex, side, fracture type, mode of injury and other associated co-morbidities. Post operative data included time to full weight bearing, average hospital stay and complications. Boyd and Griffin classification is used to classify all the intertrochanteric fractures. This study was approved by the institutional ethics committee. All the patients provided written informed consents.



All surgical procedures were performed by the same surgical team as soon as the condition of the patients was stabilized, usually within seventy two hours after their admission. Preoperative radiographs of the fractured side and contralateral side was performed to determine the approximate size and position of the stem.

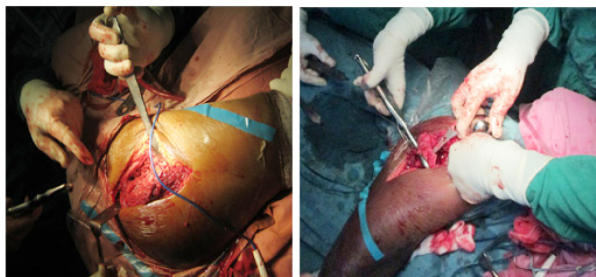


Figure 1: Intraoperative photograph showing incision & exposure

The operation was performed with the patient in the lateral decubitus position by using Moore's approach, the femoral head and neck was removed. Care was taken to preserve the integrity of the greater trochanter, abductor muscles, and all the vascularized bone fragments. The femoral medullary canal was then reamed. Trial reductions were performed to determine the exact length. Careful restoration of neck length, offset and version to maximize stability of the hip joint, was also performed during trial reduction. The definitive femoral stem was rooted into the femoral canal. The greater trochanter was reduced and stabilized by using the k-wires, screws and tension band wiring or just sutured in position after hip

reduction. The gluteus medius muscle and vastus lateralis muscle were sutured to their anatomical locations by using anchor sutures. Fascia lata was tightly closed over a suction drain. Post-operative radiographs of hip were obtained. Out of 31 patients in 19 patients the prosthesis was rooted with the help of cement.

Patients were ambulated full weight bearing on the first week after surgery. They were followed up at 6 weeks, 3 months, 6 months, 12 months and 18 months. Clinical evaluation was done according to the Harris Hip score.

RESULTS

Thirty one patients were enrolled in this study of them 27 sustained fractures after fall from a standing height, while 4 patients sustained road traffic accidents. The average age at surgery was 71.4 years (range, 65-84 years). There were 18 men and 13 women. 21 patients had type II fractures, 7 had type III fractures, and 2 had a type IV fracture (Boyd and Griffin's Classification). Singh's index (grades of osteoporosis) was grade III in 23 patients and it was grade II in 8 patients. The mean operative time was 105 ± 14 minutes. Greater trochanter was reconstructed in 17 cases. There were two cases of superficial infection and one case of deep infection.

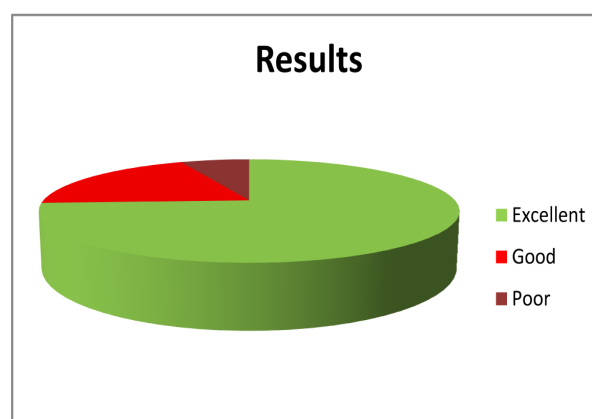
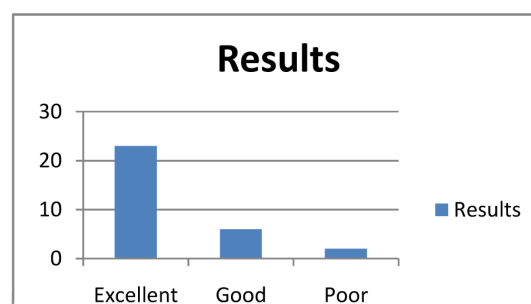




Figure 2: A) Pre-operative X-ray of pelvis with both hips showing comminuted inter trochanteric fracture of right femur (AP view)



Figure 2: B) Post-operative X ray showing bipolar prosthesis in right femur and reconstruction of GT with sutures.



Figure 3: A) Pre-operative X-ray of Pelvis with Both Hips showing comminuted inter trochanteric fracture of right femur

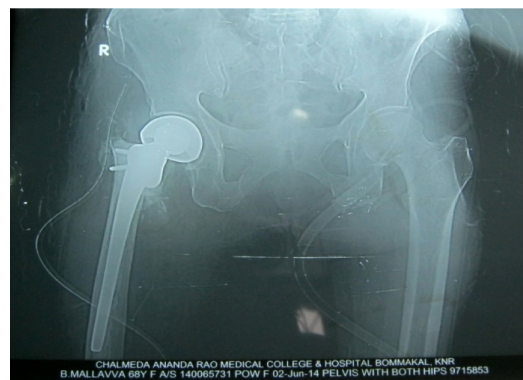


Figure 3: B) Post-operative X ray showing bipolar prosthesis in right femur and reconstruction of GT with cortical screws



Figure 4: A) Pre-operative X-ray of Pelvis with Both Hips showing comminuted inter trochanteric fracture of right femur

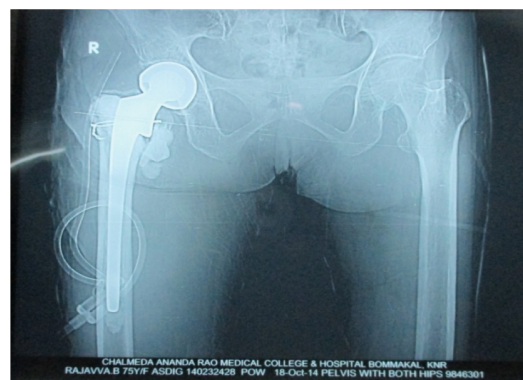


Figure 4: B) Post-operative X ray showing bipolar prosthesis in right femur and reconstruction of GT with SS wiring

Patients were discharged from the hospital at a mean, on the 5.4th post-operative day. Patients were followed up at 6 weeks, 3 months, 6 months, 9 months 12 months and 18 months. The mean Harris Hip Score was 75 points at final follow up, at the end of 18 months. A majority of the patients had a pain free mobile hip with a near full range of flexion, abduction and adequate amount of rotations and adduction.



a)



b)

Figure 5: Post-operative follow-up of patient showing
a) Hip flexion b) Abduction

DISCUSSION

Unstable comminuted Intertrochanteric fractures in elderly osteoporotic patients challenging problems, with the risk of increased morbidity and mortality. 100% union rate has been reported in stable fractures that were treated with ideal implant fixation. Failure rates of as high as 56% have been noted in association with unstable fractures, comminuted fractures, suboptimal fracture fixations, or

severely osteoporotic bone in elderly patients.^[7,8] Although the internal fixation of such fractures may reduce the morbidity of pain, it does not permit an early mobilization with a fear of implant failure and thus, indirectly, the morbidity of fracture remains the same. Early ambulation following surgeries are important, to prevent the complications that are caused by long term bed rests in elderly patients with poor general condition.

Early biomechanical failure in elderly osteoporotic patients occur due to poor mechanical properties of weak and osteoporotic bone which do not provide good purchase for the screws. This further leads to collapse, with migration of the femoral head into the varus and retroversion, resulting in limping, which is caused by shortening and a decreased abductor muscle lever arm.^[9] Another complication of internal fixation is that the implant can be cut out from the femoral head, which can lead to profound functional disabilities.

Primary bipolar Hemiarthroplasty is a frequently employed alternative, as it gives good stability and allows immediate full weight bearing. Many of the complications of internal fixations can be avoided by performing primary hemiarthroplasty.^[10] Bipolar Hemiarthroplasty was introduced to avoid the complications of unipolar implants like, protrusion, loosening, dislocation and acetabular wear. The dual bearing surfaces in prosthesis, offers considerable advantages such as sharing of the motion at the two surfaces and hence, it reduces the net wear at either surface, thus reducing erosion at the acetabular joint interface. In addition, the total range of motions at the joint is increased. Cemented fixation is advantageous for achieving the implant stability if the stem of the implant fixes loose in the femoral canal.

Tronzo was the first to use long, straight-stemmed prostheses for the primary treatment of intertrochanteric fractures.^[11] Following this, other workers also reported good results with the use of the Leinbach prosthesis.^[12] Liang et al., in their study which was done on unstable intertrochanteric fractures, concluded that Primary Bipolar Hemiarthroplasty was an effective and a safe method for treating unstable intertrochanteric fractures in elderly. It leads to a decrease in complications morbidity and mortality.^[13]

In our study, patients were allowed partial weight bearing on the second post-operative day, so there were no recumbency related complications (e.g. bedsores, chest complications, etc.) in our patients. Thus, the results primary bipolar hemiarthroplasty look promising, especially in view of the variable results of osteosynthesis.^[14]

Primary Hemiarthroplasty offers a modality of treatment that provides adequate fixation and early mobilization

in unstable intertrochanteric fractures in elderly, thus preventing postoperative complications such as pressure sores, pneumonia, and atelectasis. Delay in the surgery is one of the most important predictor of mortality in patients with intertrochanteric fractures and also of the postoperative morbidity. The corner stone of management of such fractures is early surgery, followed by early mobilization. Early mobilization is very essential, particularly in patients with other medical co-morbidities and also to prevent post-operative complications.

CONCLUSION

Primary Hemiarthroplasty for unstable osteoporotic intertrochanteric fractures in elderly results in early ambulation, less hospital stay, provides stable and mobile hips and good functional results. Weight bearing can be started earlier than in other methods of treatment, which prevents any recumbency related complications; hence it is to be considered as one of the treatment options for comminuted intertrochanteric fractures in elderly.

CONFLICT OF INTEREST: None

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