

Primary Cemented Bipolar Hemiarthroplasty in Neglected Osteoporotic Intertrochanteric Fractures

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Abstract: *Treating intertrochanteric fractures in very old osteoporotic patients has always been a challenge and when it comes to managing such fractures that have been neglected by the patients, the scenario becomes all the more difficult. Negligence of intertrochanteric fractures is often encountered in developing countries, particularly in rural population. Economic status, illiteracy, lack of medical aids and false faith in quacks and bonesetters being a few reasons for this negligence. Treatment of such fractures with conventional internal fixation faces many problems and can be better managed by cemented hemiarthroplasty. Our study aims at studying the clinical and functional outcomes of such patients treated with cemented bipolar hemiarthroplasty, in series of 16 neglected intertrochanteric fracture patients above 60 yrs of age treated at our hospital with cemented hemiarthroplasty. Functional outcome was assessed using Harris Hip Score. The main clinical measures were early postoperative full weight bearing, postoperative complications and functional outcome. According to our results, we believe that cemented bipolar hemiarthroplasty is an excellent and a viable option in elderly osteoporotic patients with a neglected intertrochanteric femoral fracture.*

Keywords: Neglected, Intertrochanteric, Fracture, Cemented hemiarthroplasty, Osteoporotic

1. Introduction

In developing countries, particularly rural population, there is often delay in trauma patients coming to orthopaedic hospital for treatment. This delay may sometimes be up to months and even years in some cases. The reasons for this negligence may be illiteracy, ignorance, and poverty, non-availability of medical aids or sometimes having more faith in quack or a bone setter than a qualified orthopaedic surgeon. Almost every village has a bonesetter whom people have faith in and easy access to, compared to an orthopaedic surgeon.

Hence, it is obvious fact that under such circumstances neglected trauma is a major problem in the so called third world countries. And when it comes to intertrochanteric femur fracture, the scenario becomes all the more worse. Negligence can be a complete neglect by the patient (no treatment at all) or treated by a quack or bonesetter.

Intertrochanteric fracture in the elderly patient is a frequent problem and is becoming more common as the proportion of elderly people in the population increases [1]. It is associated with substantial morbidity and mortality of about 15%-20% during first year. Delaying fixation in these fractures for more than three days doubles the mortality rate (Zuckerman et al). The treatment of such fractures is still controversial, despite of the publication of reports of randomized trials and comparative studies. Negligence of these fractures is usually seen in very old patients who tend to be non ambulators or just community ambulators. Thus all these factors make neglected intertrochanteric fractures in old aged osteoporotic patients difficult to treat by conventional modalities of osteosynthesis. Conventional internal fixation of these fractures encounters many problems such as excessive collapse, loss of fixation, and cut-out of the lag screw resulting in poor outcomes [2].

To allow earlier postoperative weight-bearing and to avoid excessive collapse at the fracture site, some surgeons have

recommended prosthetic replacement for the treatment of unstable intertrochanteric fractures.

The goals in the treating these fractures in elderly patients are, to restore the pre-fracture activity status, to allow early full weight bearing and to avoid possible reoperation. The purpose of this prospective study was to evaluate the functional and clinical outcomes of cemented bipolar hemiarthroplasty as a primary treatment for neglected intertrochanteric fractures in elderly patients. [3]

2. Materials and Method

During a 1 year period between November 2014 and October 2015 a prospective study was completed with 16 patients who had neglected intertrochanteric fractures at SBKS medical college and dhiraaj hospital (sumandeep university) after permission from the ethics committee and consent regarding the procedure from the patients. The inclusion criteria were: 1) inter-trochanteric fractures untreated for at least three weeks, 2) Elderly patient (60 years or older), 3) severe Osteoporosis (graded according to Singh's index).

Patients with evidence of metabolic bone disease, inflammatory arthropathy, polytrauma patients, who were non mobile pre- injury patients and those who were unfit for surgery were excluded from the study.

Cemented bipolar hemiarthroplasty was performed for all of these patients. Follow up period ranged from 6-12 months with the mean follow up period 10.7 months. 16 out of the 18 patients completed the follow up period. 2 patients died by the end of one year.

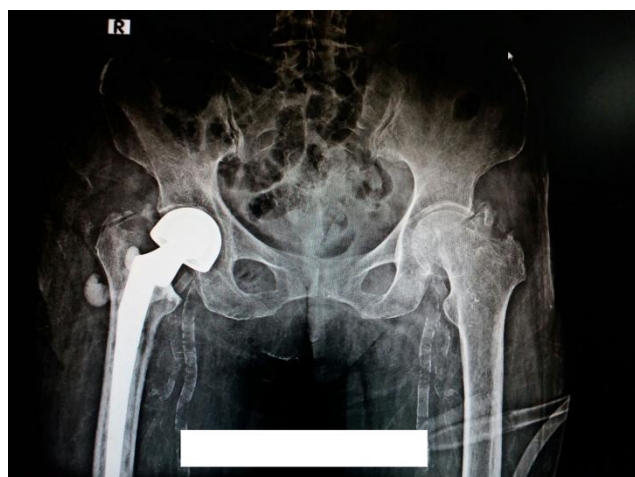
All surgical procedures were performed by the same surgeon (VMA). Preoperative templating of radiographs of the fractured side and contralateral side was performed to determine the approximate size and position of the stem and the approximate femoral neck offset. With the patients in the

lateral decubitus position, the operation was performed by using three distinct approaches based on the fracture pattern. The first approach was through the standard posterior approach if the fracture was only in sagittal plane and the greater trochanter was not fractured. If the greater trochanter was found fractured we approached the hip joint through it very much similar to a trochanteric osteotomy approach. The final approach was through the coronal split in the trochanteric region with creation of anterior and posterior fragments and approaching the hip through the interval thus created. The femoral head and neck was removed. Meticulous 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 and broached to the appropriate stem size and diameter.

Trial reductions were performed to determine the exact length that would provide the desired tension and tissue balancing of the abductor muscles and an equal leg length. The exact level of seating of trial prosthesis was marked with an Electrocautery or marking ink. Careful restoration of neck length, offset and version to maximize stability of the hip joint, was also performed during trial. Clinical evaluation was done according to Harris Hip score. Anteroposterior radiographs of the hip were analyzed at each follow up to note any evidence of loosening.



Preoperative Xray



Postoperative Xray

3. Results

Sixteen patients were enrolled in this study. 7 patients were taken to a bonesetter before bringing them to the hospital. Rest 9 did not receive any sort of treatment at all.

Period of negligence	3-4 wks	1-2 months	3-6 months	>6 months
No. of patients	7	4	4	1

Singh's index was grade three in 5 patients, grade two in 10 patients and grade 1 in one patient. The mean operative time was 114 minutes. Greater trochanter was reconstructed in 9 cases using stainless steel cables. [4] There were no cases of infections in the study.

All patients were ambulated full weight bearing on second post-operative day. Sutures were removed on 12th day and patients were discharged. They were followed up at 6wks, 3 months, 6months and 12 months. Two cases had shortening of less than 1 cm and 2 patients had 2 cm shortening. There was no incidence of post-operative dislocations of the prosthesis.

4. Discussion

Complexity of intertrochanteric fractures in elderly osteoporotic patients poses challenging problems, with an added risk of increased morbidity and mortality. Several surgical options exist for the treatment of unstable intertrochanteric fractures including plating and nailing but they have their own complications. Traditionally, the consensus was to preserve the normal bone by open reduction and internal fixation. The technique is familiar to orthopaedic surgeons, and it is relatively rapid. Arthroplasty is a less frequently employed alternative, although it allows immediate full weight bearing. [5] Many of the complications of internal fixation mentioned above are avoided by performing arthroplasty. Several studies have been published reporting the results of treatment using different techniques. Studies of internal fixation of both stable and unstable intertrochanteric hip fractures reported failure rate between 6% - 32%.

5. Results of Study

Mean age in years	74.3
Infection	none
Dislocations	none
Bed sores	Superficial -2
Limb length discrepancy	4 patients (<2 cm)
Deep vein thrombosis	1 (non fatal)
HHS at 6 months	76.25
HHS at 12 months	83.25

Although the internal fixation of such fractures may reduce the morbidity of pain, it does not permit an early mobilization with a fear of failure of fixation and thus, indirectly, the morbidity of fracture due to delayed weight bearing restrictions remain the same. Early ambulations following surgeries are important, for preventing complications that can be caused by long term bed rests in elderly patients with poor general conditions. The poor

mechanical properties of the weak and osteoporotic bones in elderly patients do not provide a good purchase for the screws, which subsequently lead to an 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 a decreased abductor muscle lever arm. Another complication of internal fixation is that the implant can be cut out from the femoral head, which can lead to subsequent hip arthritis and profound functional disabilities.

Hemiarthroplasty is a frequently employed alternative, as it gives stability and allows immediate full weight bearing. Many of the complications of internal fixations can be avoided by performing hemiarthroplasties [6]. Bipolar hemiarthroplasty was introduced to address the complications of unipolar implants like acetabular wear, protrusion, loosening and dislocation. The concept of dual bearing surfaces in prosthesis, offers considerable advantages. It results in 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. Stems were designed, more in lines with total hip replacement designs, to lessen component loosening. Careful restoration of neck length, offset and version maximize stability of the hip joint and increases the durability of the prosthesis.

The cornerstone of management of such fractures is early surgery, followed by mobilization. Early mobilization is very essential, particularly in patients with other medical comorbidities and also to prevent post-operative complications.

6. 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. This study also had too few patients for doing analyses on long term complications such as infections, dislocations, periprosthetic fractures and loosening of the prostheses. A larger prospective randomized study which compares the use of intramedullary devices against primary hemiarthroplasty for unstable osteoporotic fractures is needed, to study these concerns.

7. Conclusion

Hemiarthroplasty using bipolar prosthesis for the neglected intertrochanteric fractures of the femur in elderly has good clinical results; in terms of early post-operative ambulation. This will have a direct effect on the general condition and decreased morbidity and mortality. [7]

Patient selection is very important as we are directing this to the elderly people with sub-normal bone quality having untreated neglected intertrochanteric fractures.

The procedure provides rapid mobilization and improved the QoL in elderly patients with intertrochanteric fractures of the femur.

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