

PRIMARY MODULAR BIPOLAR HEMIARTHROPLASTY FOR UNSTABLE OSTEOPOROTIC INTERTROCHANTERIC FRACTURES IN ELDERLYSanjay K. Gupta¹, V. P. Pathania², Maneesh Sharma³**HOW TO CITE THIS ARTICLE:**

Sanjay K. Gupta, V. P. Pathania, Maneesh Sharma. "Primary Modular Bipolar Hemiarthroplasty for Unstable Osteoporotic Intertrochanteric Fractures in Elderly". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 12, March 24; Page: 3148-3153, DOI: 10.14260/jemds/2014/2258

ABSTRACT: BACKGROUND: The optimal treatment for unstable intertrochanteric fractures in elderly patients is challenging because of difficult anatomical reduction, poor bone quality and delayed weight bearing. Internal fixation in these cases usually involves prolonged bed rest or limited ambulation to prevent implant failure secondary to osteoporosis that may develop complications like deep vein thrombosis, pulmonary embolism, pneumonia and bed sores. **MATERIAL & METHOD:** In 20 patients > aged 75 years with diagnosis of unstable intertrochanteric fractures (Evans III/IV), primary modular bipolar hemiarthroplasty was done and follow up was done for 2 years. **RESULTS:** The average age of the study subjects was 82 years (range 75-90 years). There were 12 males and 8 females. 12 patients (63.2%) were graded excellent, 6(31.6%) as good and 1(5.3%) as poor according to Harris hip score. There were no dislocation, loosening or late infection. **CONCLUSION:** Modular Bipolar hemiarthroplasty for unstable osteoporotic intertrochanteric fractures in elderly results in early weight bearing and improved quality of life.

KEYWORDS: Primary modular bipolar hemiarthroplasty, unstable intertrochanteric fracture, elderly.

INTRODUCTION: Intertrochanteric fracture in the elderly patient is a common problem and is becoming more common, due to increased life expectancy and osteoporosis.^{1,2} The mechanism of injury is mostly trivial trauma. Stable fractures can be easily treated with osteosynthesis with predictable results, but the unstable inter trochanteric fractures (Evans type III or IV) is a challenge, as the anatomical reduction and its maintenance is difficult due to unstable nature of fracture and moderate to severe osteoporosis.^{3,4} Excessive collapse, loss of fixation and cut out of the lag screw are associated with Internal fixation.^{5,6} These complications leads to late mobilization and weight bearing with DHS in these elderly patient. This is responsible for high rate of mortality as much as 20% during the first post-operative year in elderly patients with unstable I.T. fracture due to complications like atelectasis, bed sores, pneumonia, DVT as result of incumbency in bed.^{7,8}

Proximal femoral nailing has shown better results in cases of unstable intertrochanteric fractures.^{9, 10} However, the role of this nail in unstable osteoporotic and comminuted intertrochanteric fractures is still to be defined. To allow early post-operative weight bearing and to avoid excessive collapse at fracture site, some surgeons have recommended prosthetic replacement for the treatment of this intertrochanteric fractures.¹¹⁻¹⁸

The purpose of this study is was evaluate the results of primary modular bipolar hemiarthroplasty in case of unstable osteoporotic intertrochanteric femur fracture.

MATERIAL AND METHODS: 20 patients admitted in SRMSIMS, Bareilly between 2009 and 2012 with diagnosis of unstable I.T. fracture of femur (EVANS III/IV) with osteoporosis (according to Singh's index) were included in the study. These patients were all above 75 yrs. of age and were

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independently mobile before sustaining the fracture. Exclusion criteria included patients unable to walk before fracture, patients <70 yrs. old, patients with stable fractures and intact lesser trochanteric and patients with pathological fractures. Preoperative data included age, sex, fracture type, preoperative comorbid medical problems. Perioperative data included type of anesthesia, operative time, amount of blood loss. Post-operative data included time to full weight bearing, duration of hospital stay, post-operative complications such as pulmonary embolism, DVT, UTI, infection (superficial/deep), pressure sores, prosthetic dislocation and mortality. All cases were operated by Moore's approach in lateral position. After assessing the fracture fragments, the neck of femur was cut at almost transcervical level. First femoral canal was reamed to appropriate stem size and diameter.

Now last size femoral broach was put in the medullary canal of shaft of femur for same distance. Now the comminuted greater trochanter and separate lesser trochanteric fragments were reduced and fixed to shaft by tension band wire or cerclage wires, or ethibond (if several, comminuted) over the breach. If some part of the neck attached to lesser trochanter or greater trochanter, was cut at a level, determined by preoperative templating of the uninjured side. Trial reductions were performed to determine the exact length that will provide the desired tension and tissue balancing of the abductor muscles and equal limb length. Careful restoration of neck length, offset, version to maximize stability of hip joint was also performed during trial by modularity and positioning of Implant. Now the definitive femoral stem was implanted into femoral canal by second generation cementing techniques. Any excess of cement between reduced bony fragments was cleaned out.

In case where medial calcar could not be reconstructed, we used long stem prosthesis. Short external rotators with capsule were stitched to G.T. and fascia lata was tightly closed over a suction drain.

All patients underwent a routine postoperative physiotherapy protocol that included early gait training with the help of walker starting 2nd/3rd day post-surgery. The rehabilitation then progressed as tolerated by the patient. Patients were examined post operatively at 6 weeks, 3 months, 6 months, 1 year At each follow up visit, a clinicoradiological examination was done and the patients were evaluated using the Harris hip score (HHS) and graded as <70 poor, 70-79 fair, 80-89 good and 90-100 Excellent.

Antero-posterior and lateral radiographs of the affected hip were made post operatively and each follow up visit. The radiological signs of acetabular erosion and loosening of stem were assessed.

RESULTS: All of the enrolled patients (20) had unilateral Intertrochanteric fracture of hip (Evans III and IV). The average age of patient was 82 years (range 75-90 yrs.). There were 12 males (60%) and 8 females (40%). Nine (45%) of our patients had associated comorbidities (Hypertension, Diabetes). 15 patients were walking independently without support and 5 patients were walking with help of single stick before fracture. All patients were operated within 15 days of the trauma with delay due to patient presenting late and time taken for patients to be fit for anesthesia. The average surgery time was 100 minutes (range 70-120 minutes) with an average intraoperative blood loss of 450 ml (range 275-600 ml). In 3 patients we used long stem prosthesis due to severe comminution on medial side. The patients started full weight bearing at an average 4 days after surgery (3-10 days). The average hospital stay was 11 days (range 6-20 days). One of the patients, who was very obese, developed bed

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sore post operatively and required a week more of hospital stay, till the healing of sore. Out of the 20 operated patients, one 87 years old female with associated co-morbidities (hypertension, diabetes and ischemic heart disease) expired 4 months after surgery due to unrelated causes (M.I.)

Rest of the patients were followed up for a minimum 12 months, with an average follow up time of 26 months (range 12-30 months). One patients developed pneumonia which settled down with I.V. antibiotics. At the end of 3 months, out of surviving 19 patients, 7 patients (36.8%) were graded by Harris Hip Score as excellent, 10 patients (52.6%) as good, and 2 (10.5%) patients as fair and 1 patient (5.3%) as poor. At the latest follow up (mean 26 months range 16-30 months) the mean HHS was 92.6 (range 70-97). A total of 12 (63.2%) patients were graded excellent. 6 (31.6%) as good and 1 (5.3%) as poor. Pre injury 15 (78.9%) patients were walking without support and 5 (26.3%) were walking with support of one stick. At last follow up, 16 patients were walking without aid, 2 patients had a limp and used a stick and one patient used walker. 8 (42.1%) patients had shortening of operated limbs with an average shorting of 1 cm (0.5-1.5 cm).

A total of 12 patients had an abductor lurch at 3 months follow up. However only 2 patients had abductor muscle weakness with +ve trendelenberg test at final follow up but these patients however could walk well with use of a stick. The patient with poor result had wound infection which settled down with a course of i.v. antibiotics for 2 weeks, but this patient continued to have diffuse pain along the incision site and walked with limp and with support of walker. There were no dislocation, loosening or late infection.

DISCUSSION: Most intertrochanteric hip fractures can be treated successfully with internal fixation.^{19,20} Dynamic hip screw, Proximal femoral nail are being used & have drastically reduced morbidity & mortality associated with intertrochanteric fractures, but in unstable fractures with osteoporosis early mobilization is still avoided.²²⁻²⁴ Early postoperative full weight bearing in primary hemiarthroplasty is the main reason for significant reduction in post-operative complications such as pressure sores and pulmonary complications and improving quality of life of patient.²¹

Initially hemiarthroplasty was used in failure cases of primary internal fixation. Grimsrud et. al. studied 39 consecutive patients of unstable intertrochanteric fracture treated with a cemented bipolar hip arthroplasty.²⁵ They concluded that these fractures can be treated with a standard femoral stem and circlage cabling of the trochanters. The technique allowed safe & early weight bearing on the injured hip and had a relatively low rate of complications. In our series too there was only one case of pressure sores which healed with conservative management. Since most of the patients were out of bed on 3rd/4th post-operative day, so recumbancy time was minimal. Only one patient developed pneumonia which settled down with i.v. antibiotics.

It is said that, in arthroplasty group there is increased operative time, increased blood loss and mechanical complications like dislocation and infection. In a study of Shen J & Wang DL,²⁷ there was a comparison of internal fixation & bipolar hemiarthroplasty in 124 patients. They concluded that cemented bipolar hemiarthroplasty is the treatment of choice in freely mobile elderly patients above 70 years of age with an intertrochanteric femoral fracture. Post-operative full weight bearing after hemiarthroplasty spares the post-operative complications of non-weight bearing after internal fixation.

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Stappaerts et al. found higher blood loss in replacement group.²⁶ In our series; the average blood loss was 450 ml. We used modular bipolar prosthesis, which gives better post-operative limb length restoration & tissue balancing and decreases the chances of abductor lurch and dislocations.

CONCLUSION: Primary modular bipolar hemiarthroplasty provides a stable, pain free and mobile joint with improved quality of life for patients >70 yrs. with unstable intertrochanteric modular fracture with moderate to severe osteoporosis. Normally a standard modular Bipolar stem with circlage wiring is sufficient but in cases with severe comminution of medial side of shaft of femur, long modular stem prosthesis gives more stability and decreases intra operative time needed for reconstruction. Modularity in prosthesis gives better limb length adjustment and tissue balancing, hence further decreasing the chances of abductor lurch and dislocation.

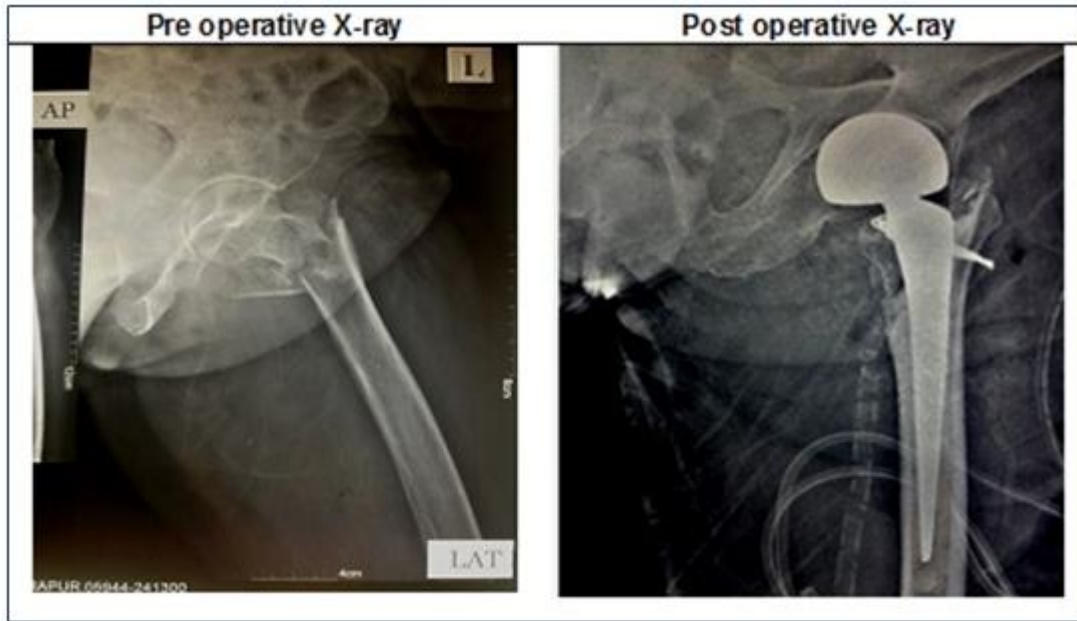
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