



Alternate Technique for Delivering Femoral Head in Fracture Neck of Femur during Hemi Replacement Arthroplasty & Assessing Accurate Prosthesis Size

* Dr Deepak Chaudhary

Department of Orthopaedics, Mahatma Gandhi Medical College & Hospital, Jaipur (Raj.) India *Corresponding Author

Dr Saurabh Bansal

Deptt. of Orthopaedics, Mahatma Gandhi Medical College & Hospital Jaipur (Raj) India

Dr Rajeshwar Kalla

Deptt. of Orthopaedics, Mahatma Gandhi Medical College & Hospital Jaipur (Raj) India

ABSTRACT

Objective: To assess functional outcome & results of delivering femoral head by this technique during Hemi Replacement Arthroplasty in fracture neck of femur & assessing accurate prosthetic size.

Design: Prospective clinical study.

Methods: Clinically proven one fifty elderly patients of fracture neck of femur going for HRA participating in study included in study according to inclusion and exclusion criteria after getting written and informed consent.

Results: One fifty patients participated in study and in all patients femoral head was removed in single piece and accurate size of prosthetic head was measured which helped in implanting accurate prosthesis during HRA and good to excellent results were achieved postoperatively.

Conclusions: Hip replacement is a successful procedure for elderly population over 70 years in fracture neck of femur (NOF). It leads to return to pre-morbid level of activity and independent functions occurs very swiftly, avoiding the hazards of prolonged incumbency. The success of HRA depends mainly on accuracy of prosthetic size. For this we have proposed a technique for removal of femoral head in single piece during HRA without fracturing or comminuting femur head during removal, so that we can have accurate measurement for prosthetic head size. After judging size of prosthesis head we reconfirm it by inserting same size of AM prosthesis in acetabulum, in this manner accurate sized bipolar implant is placed.

KEYWORDS : NOF, HRA, Elderly patient

INTRODUCTION

Intracapsular fracture of proximal femur forms a major share of fractures in elderly¹. Osteoporosis, co-morbidities, increased incidence of trivial trauma increases the incidence and complicates the treatment of these fractures. This high incidence is due to weak bones and increased incidence of trivial trauma. People in this age group suffer from numerous illnesses that can aggravate the morbidity following fractures and complicate the treatment of these fractures. The goal of treatment is to return the patient to his or her pre-morbid status of function. Increase in the average lifespan and improved medical facilities have greatly increased the incidence of these fractures.

Management of femoral neck fractures in elderly patients has been controversial. Femoral neck fractures have been considered 'unsolvable fractures' in the older era of orthopedics² due to the high rate of associated complications, which include nonunion and avascular necrosis of the femoral head, among others. Intracapsular extent of the fracture, tenuous blood supply to the femoral head going through the neck and difficulty in maintaining fracture reduction have been cited as reasons for failure of fixation²⁻⁴. Important factors to consider in choosing any treatment modality are intrinsic, viz. patient age, general medical condition, type of fracture; and extrinsic, viz. availability of facilities and socio-economic status. Hip replacement arthroplasty (partial or total) is emerging as the most viable treatment option⁵⁻⁹. The success of HRA depends mainly on accuracy of prosthetic size. For this we have proposed a technique for removal of femoral head in single piece during HRA without fracturing or comminuting femur head during removal, so that we can have accurate dimension for prosthetic head size.

MATERIALS AND METHODS-

After approval from institutional ethical committee (IEC), clinically diagnosed 150 elderly patients aging ≥ 70 years of both sexes having fracture NOF admitted in our hospital for HRA included in study and patients with any history of comminuted head femur fracture, acetabular fracture and life expectancy < 5 years excluded from study. All the patients were explained about the study and an informed &

written consent was obtained. Only those providing consent to participate in the study were enrolled in the study. All the patients were treated by Hemi Replacement Arthroplasty (cemented/ uncemented) by Moores approach or by Hardinge approach.

After standard dissecting protocol according to the approach used after reaching the head of femur, we grasp it between two burkit types of periosteum elevators or between two Hommens retractor, now ligamentum teres is cut by scissors and head of femur is delivered out by manipulating retractor instead of using cork screw. In this manner it's easier to deliver out head in single piece which is very important to measure exact size of prosthesis being used. While in using corkscrew there are chances of comminuting head in osteoporotic bones which are very common at this age or by over zealous manipulation. After judging size of prosthesis by femoral head we reconfirm it by inserting same size of AM prosthesis in acetabulum, in this manner accurate sized bipolar implant is placed.

Patients were reviewed at two weeks (for suture removal), one month, and six months and assessed using clinical and radiological criteria. Clinical criteria used were absence of pain and limp, as well as the ability to perform activities of daily living independently and the Harris Hip scores. All patients were studied radiologically for signs of loosening, subsidence (cemented implants), lysis and osteointegration (cementless implants).

STATISTICAL ANALYSIS-

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean \pm SD.

RESULTS-

Baseline data-

| | |
|------------------------|-----------------------------------|
| Demography Male/Female | 84/76 Total 150 |
| Age of patients | Average 74 years, Range 71-90 yrs |

| | |
|----------------------------------|---------------------------|
| Bipolar Cemented/Uncemented | 118/32 |
| Our technique of removal of head | 100% |
| Fracture of head during removal | 0 |
| Harris Hip Score | Average 86 (range 70-96) |

Out of 150 enrolled patients 84 were male (56%) and 76 were females (44%) and mean age of participants was 74 years ranging from 71 to 90 years. Cemented bipolar used in 118 (78.6%) patients while uncemented bipolar prosthesis was used in 32 (21.4%). We removed head of femur by our technique in 100% of cases and without fracturing or comminuting any head during this process. The average blood loss during surgery was 190 ml (range, 100-500 ml). Average Harris Hip scores post operatively at final follow up was 86 (range, 70-96).

Postoperative protocol for patients with cemented implants involved full weight-bearing as soon as possible (as per patient ability to stand supported) and active hip and knee exercises. Patients with cementless implants were mobilized to non-weight-bearing for three weeks, partial weight-bearing for the following nine weeks and then allowed full weight-bearing without support. Active hip abduction exercises were initiated at six weeks.

DISCUSSION-

In our study we had good results in the patients that we treated, in terms of return to pre-fracture level of activity, independent ambulation and satisfaction with the procedure. Hip fractures in the elderly patient group result in implications in medicine, rehabilitation, psychiatry and healthcare economics. Parker *et al.*⁴ in a review of displaced femoral neck fractures, stated that for those aged less than 50-60 years preservation of the femoral head is paramount. With increasing age the arguments against arthroplasty diminish since the life expectancy of the patient becomes less than that of the arthroplasty and the functional demands on the hip are less. The incidence of nonunion increases progressively with age, while symptomatic avascular necrosis is less common in the elderly²⁻³. According to a prospective randomized comparative study by Keating and Masson *et al.*,¹⁰ of the treatment of displaced femoral neck fractures in the elderly with internal fixation, hemi or total hip arthroplasty, the internal fixation procedure was found to be associated with a high rate of revision surgery and an inferior functional outcome compared with that of arthroplasty. Hip replacement is a successful procedure for the elderly population over 70 years with femoral neck fractures. The success of HRA depends mainly on accuracy of prosthetic size. Accurate prosthetic head size is best judged by intact single piece head of femur. By our technique of removal of head its possible to deliver out femoral head in single piece without fracturing. After judging size of prosthesis head we reconfirm it by inserting same size of AM prosthesis in acetabulum, in this manner accurate sized bipolar implant is placed.

CONCLUSION-

Hip replacement is a successful procedure for elderly population over 70 years in fracture neck of femur (NOF). return to pre-morbid level of activity and independent functions occurs very swiftly, avoiding the hazards of prolonged incumbency. The success of HRA depends mainly on accuracy of prosthetic size. For this we have proposed a technique for removal of femoral head in single piece during HRA without fracturing or comminuting femur head during removal, so that we can have accurate dimension for prosthetic head size. After judging size of prosthesis head we reconfirm it by inserting same size of AM prosthesis in acetabulum, in this manner accurate sized bipolar implant is placed.

REFERENCES-

- Holmberg S, Kalen R, Thorngren KG. Treatment and outcome of femoral neck fractures: An analysis of 2418 patients admitted from their own homes. Clin Orthop Relat Res. 1987;218:42-52.
- Barnes R, Brown JT, Garden RS, Nicoll EA. Subcapital fractures of the femur: A prospective review. J Bone Joint Surg Br. 1976;58:2-24.
- Parker MJ. Prediction of fracture union after internal fixation of intracapsular femoral neck fractures. Injury. 1994;25:3-6.
- Parker MJ. The management of intracapsular fractures of the proximal femur. J Bone Joint Surg Br. 2000;82:937-41.
- Davison JN, Calder SJ, Anderson GH, Ward G, Jagger C, Harper WM, et al. Treatment for displaced intracapsular fracture of the proximal femur: A prospective, randomized trial

in patients aged 65 to 79 years. J Bone Joint Surg Br. 2001;83:206-12.

- Rogmark C, Carlsson Å, Johnell O, Sernbo I. A prospective randomized trial of internal fixation versus arthroplasty for displaced fractures of the neck of the femur: Functional outcome for 450 patients at two years. J Bone Joint Surg Br. 2002;84:183-8.
- Soreide O, Mölster A, Raugstad TS. Internal fixation versus primary prosthetic replacement in acute femoral neck fractures: A prospective, randomized clinical study. Br J Surg. 1979;66:56-60.
- Sikorski JM, Barrington R. Internal fixation versus hemiarthroplasty for the displaced subcapital fracture of the femur: A prospective randomized study. J Bone Joint Surg Br. 1981;63:357-61.
- Parker MJ, Pryor GA. Internal fixation or arthroplasty for displaced cervical hip fractures in the elderly: A randomized controlled trial of 208 patients. Acta Orthop Scand. 2000;71:440-6.
- Keating JF, Grant A, Masson M, Scott NW, Forbes JF. Randomized comparison of reduction and fixation, bipolar hemiarthroplasty and total hip arthroplasty in the treatment of displaced intracapsular hip fractures in healthy older patients. J Bone Joint Surg Am. 2006;88:249-60.