

Outcome of Bipolar Hemi Arthroplasty: Analysis of Using Lateral and Posteriolateral Approach

Shehzad Ahmad,¹ Ashfaq Ahmed,^{1*} Jamil Ahmed,¹ Rizwan Akram,¹ Shahzad Javed,¹ Naeem Ahmed,¹ Amer Aziz¹

ABSTRACT

Objective To find the outcome of bipolar hemiarthroplasty using posteriolateral and lateral approaches.

Study design Descriptive case series.

Place & Duration of study Departments of Orthopaedics and Spine Centre, Ghurki Trust Teaching Hospital Lahore, from January 2015 to December 2016.

Methodology Patients of either sex and of age above 40 year, who presented in Emergency Department with femoral neck fractures, were included in the study. Data included basic demographic profile, Harris hip scoring, duration of surgery, hospital stay and blood loss.

Results A total of 200 patients were included in the study. There were 77 (38.5%) males and 133 (61.5%) females. Male to female ratio was 0.58:1 with mean age of 58.2 ± 6.02 year. Mean follow up was 14.2 ± 2.5 months. In 134 (67.0%) patients there was history of fall, 41 (20.5%) presented with fracture after low energy vehicle accident, 20 (10.0%) presented after high energy vehicle accident. Duration of surgery and blood loss were less in posteriolateral approach. The complication rate and Harris hip scoring was similar in both the approaches.

Conclusions Outcome of surgery in terms of infection, mobility and pain as well as dislocations were similar in both the approaches. The posterior approach was superior in terms of short duration of surgery and less blood loss.

Key words Hemiarthroplasty, Harris hip scoring, Femoral neck fractures.

INTRODUCTION:

Displaced femoral neck fracture in the elderly is a global challenge. There is alarming trend of rise in the incidence of these fractures with increasing age. It is predicted that the total number of patients suffering from femoral neck fracture will rise to 6.26 million per year by 2050 worldwide.¹ One-year mortality rate currently range from 14% to 36%, and

care for these patients represents a major global economic burden. The incidence of hip fractures is bimodal in its distribution. In young adults, hip fractures are the result of high energy trauma, and the larger peak is found in the elderly population which is due to low-energy injuries.² There are several factors which increase the mortality in such fractures like deep venous thrombosis, muscle wasting, pressure sores and chest infections.^{3,4}

¹ Department of Orthopaedic Surgery & Spine Center Ghurki Trust Teaching Hospital, Lahore.

Correspondence:

Dr. Ashfaq Ahmed ^{1*}

Department of Orthopaedic Surgery & Spine Center Ghurki Trust Teaching Hospital Lahore.

E mail: ashfaqjadoon40@yahoo.com

The Austin-Moore hemiarthroplasty has been used for over six decades, and continues to be the most frequently performed type of arthroplasty for physiologically compromised and dependent elderly patients. Although its insertion is easy, with short duration of surgery and early mobilization, but has high re-operation rate.⁵ Nowadays bipolar hemiarthroplasty is performed for femoral neck

fractures in the elderly because of its own benefits.⁶

Several factors related to implant also affect the outcome of surgery. It is found that large diameter femoral head articulations may reduce dislocation rates in patients who have a high preoperative risk for dislocation while providing the same functional improvements and safety as small diameter bearings.⁷ Similarly it is found that cemented stems and a direct lateral transgluteal approach reduce the risk of reoperation after hip fractures treated with hemiarthroplasty in patients over 75 year of age.⁸ In a meta-analysis after reviewing 1169 patients, the cemented implants were not found good because of longer operative time, lower reduction in mobility score and persistent pain.⁹ The most common surgical approaches in total hip arthroplasty are the posteriolateral and the anterolateral transgluteal approach.¹⁰ There is still a debate as to the most useful approach in this condition. The main focus of this study was to determine the outcome of these two approaches in elderly population.

METHODOLOGY:

This descriptive case series was carried out at the Department of Orthopedics and Spine Center, Ghurki Trust Teaching Hospital Lahore, from January 2015 to December 2016, after approval from hospital ethics committee. Patients of age more than 40 year, of either sex, admitted through Emergency Department with femoral neck fracture were included in the study. Patients who were lost to follow up and having ASA 4 risk category, were excluded from the study. Patients were divided into two groups using simple random sampling technique. After taking history, examination and investigations, all the patients underwent hemiarthroplasty of the affected side. Group A patients were operated through lateral approach and Group B patients through posteriolateral approach. Patients were mobilized on 2nd postoperative day with walker with full weight using knee immobilizer for two weeks to prevent adduction movements. Patients were regularly

followed for at least one year. The assessment was done by using Harris hip scoring. Harris hip scoring consists of three sections. Each section has different variables. The score of less than 70 is rated as poor, between 70-79 fair, between 80-89 good and above this excellent.

The data included patients' age, sex, mechanism of injury, associated bones involved, duration of surgery, blood transfusion need, radiographic findings and co morbid. Data was entered into SPSS version 17.0. Frequencies and percentages were calculated. Data presented in tables where necessary.

RESULTS:

A total of 200 patients were included in the study. Males predominated (n=77 - 38.5%) with male to females ratio of 0.58:1. The mean age of patients 58.28 ± 6.02 year. Femur neck fracture was more common on right side (n=121 - 60.5%). Most of the patients were between 51 year - 60 year (n=88 – 44%) and 61(30.5%) were above 60 year of age. Mechanism of injury is given in table I. Fall was the most common mode of injury (n=134 - 67.0%). Co morbid are shown in table II.

Mean time at presentation to hospital after fracture was 5.8 ± 2.3 days. The mean duration between hospital admission and surgery was 1.3 ± 0.5 days. The mean duration of surgery with posteriolateral approach was 90±15 minutes and with the lateral approach 120±30 minutes. Mean blood loss with posteriolateral approach was 150±35 ml and with the lateral approach 180 ± 0 ml. The total hospital stay was 7.1 ± 2.8 days. Mean follow up was 14.2 ± 2.5 months.

Out of the total 5 (2.5%) patients presented with deep infection in whom implant was removed. Four (2.0%) patients with superficial infection were managed conservatively. Seven (3.5%) patients presented with dislocation, in whom 4 (2.0%) underwent closed reduction and 3 (1.5%) needed open reduction. Among nine patients who presented with wound infection, five patients were from lateral

Table I: Mechanism of Injury

Mechanism	Frequency (n)	Percentage (%)
Fall	134	67.0
Low energy vehicle accident	41	20.5
High energy vehicle accident	20	10.0
Others	5	2.5
Total	200	100

Table II: Co morbid	
Co morbid	Frequency (n)
Diabetes mellitus	98
Hypertension	24
Cardiac problem	19
Multiple co morbid	22
Total	163

Table III: Analysis of Harris Hip Scoring in Both Approaches		
Follow up Duration	Lateral Approach (Score)	Posteriolateral Approach (Score)
2 weeks	70 ± 13	68 ± 14
3 months	76 ± 11	77 ± 9
6 months	81 ± 9	8 ± 7
12 months	86 ± 8	85 ± 9

posteriolateral approach and four patients from approach group. Among the seven patients with dislocations, four were from posteriolateral approach and three from lateral approach. The Harris Hip Score is given in table III.

DISCUSSION:

Hip arthroplasty outcome differs when it is done in emergency as compared to elective procedure. Patients with emergency hemiarthroplasty for fracture hip bone have more weak and osteoporotic bones, with more co morbidities and limited perioperative workup. These factors lead to a higher risk of complications, morbidity and perioperative mortality.¹¹ Total hip arthroplasty or hemiarthroplasty are used to treat displaced femoral neck fractures. However, the optimal treatment of these fractures remained controversial. In our study it is found that there was no difference in either of the approaches for hemiarthroplasty of hip joint.¹²

Leonardsson et al concluded that in Sweden population the bipolar implants had a higher risk of reoperation irrespective of cause because of dislocation, infection and periprosthetic fracture. Moreover they also found that the risk of reoperation due to acetabular erosion was lower than for unipolar implants, but reoperation for this complication was rare.¹³ Spaans AJ et al found that the anterior approach in total hip arthroplasty is difficult but provide adequate fixation though its complication rate is higher than posteriolateral approach.¹⁴

Enocson A et al found that the risk of reoperation or dislocation is not associated with the type of

implant, nor with the age, gender or the surgeon's experience. Moreover the secondary hemiarthroplasty has more risk of reoperation and dislocation as compared to primary hemiarthroplasty.¹⁵ In this study no difference was found with both the surgical approaches. There are certain limitations in our study. All patients did not come for follow up. Cement was used in all cases and no comparison was made with cement-less approach. Thirdly an implant from different manufacturers was used.

CONCLUSIONS:

The outcome of surgery in terms of infection, mobility and pain as well as dislocations were similar in both the approaches. With posteriolateral approach duration of surgery and blood loss were less than other approach.

REFERENCES:

1. Zhao Y, Fu D, Chen K, Li G, Cai Z, Shi Y, et al. Outcome of hemiarthroplasty and total hip replacement for active elderly patients with displaced femoral neck fractures: a meta-analysis of 8 randomized clinical trials. PLoS One. 2014;9:e98071.
2. Antapur P, Mahomed N, Gandhi R. Fractures in the elderly: when is hip replacement a necessity. Clin Interv Aging. 2011;6:1-7.
3. Azegami S, Gurusamy KS, Parker MJ. Cemented versus uncemented hemiarthroplasty for hip fractures: a

- systematic review of randomised controlled trials. *Hip Int.* 2011;21:509-12.
4. Renken F, Renken S, Paech A, Wenzl M, Unger A, Schulz AP. Early functional results after hemiarthroplasty for femoral neck fracture: a randomized comparison between a minimal invasive and a conventional approach. *BMC Musculoskelet Disord.* 2012;13:141.
 5. Lin C-C, Huang S-C, Ou Y-K, Liu Y-C, Tsai C-M, Chan H-H, et al. Survival of patients aged over 80 years after Austin-Moore hemiarthroplasty and bipolar hemiarthroplasty for femoral neck fractures. *Asian J Surg.* 2012;35:62-6.
 6. Baba T, Shitoto K, Kaneko K. Bipolar hemiarthroplasty for femoral neck fracture using the direct anterior approach. *World J Orthop.* 2013;4:85-9.
 7. Plate JF, Seyler TM, Stroh DA, Issa K, Akbar M, Mont MA. Risk of dislocation using large- vs. small-diameter femoral heads in total hip arthroplasty. *BMC Res Notes.* 2012;5:553.
 8. Rogmark C, Fenstad AM, Leonardsson O, Engesæter LB, Kärrholm J, Furnes O, et al. Posterior approach and uncemented stems increases the risk of reoperation after hemiarthroplasties in elderly hip fracture patients: An analysis of 33,205 procedures in the Norwegian and Swedish national registries. *Acta Orthop.* 2014;85:18-25.
 9. Schneider K, Audigé L, Kuehnel S-P, Helmy N. The direct anterior approach in hemiarthroplasty for displaced femoral neck fractures. *Int Orthop.* 2012;36:1773-81.
 10. Lindgren V, Garellick G, Kärrholm J, Wretenberg P. The type of surgical approach influences the risk of revision in total hip arthroplasty: a study from the Swedish Hip Arthroplasty Register of 90,662 total hip replacements with 3 different cemented prostheses. *Acta Orthop.* 2012;83:559-65.
 11. Coomber R, Porteous M, Hubble MJ, Par5er MJ. Total hip replacement for hip fracture: Surgical techniques and concepts. *Injury.* 2016;47:2060-4.
 12. Liao L, min Zhao J, Su W, fei Ding X, jun Chen L, xing Luo S. A meta-analysis of total hip arthroplasty and hemiarthroplasty outcomes for displaced femoral neck fractures. *Arch Orthop Trauma Surg.* 2012;132:1021-9.
 13. Leonardsson O, Kärrholm J, Åkesson K, Garellick G, Rogmark C. Higher risk of reoperation for bipolar and uncemented hemiarthroplasty: 23,509 procedures after femoral neck fractures from the Swedish Hip Arthroplasty Register, 2005–2010. *Acta Orthop.* 2012;83:459-66.
 14. Spaans AJ, Hout JAVd, Bolder SB. High complication rate in the early experience of minimally invasive total hip arthroplasty by the direct anterior approach. *Acta Orthop.* 2012;83:342-6.
 15. Enocson A, Hedbeck CJ, Törnkvist H, Tidermark J, Lapidus LJ. Unipolar versus bipolar Exeter hip hemiarthroplasty: a prospective cohort study on 830 consecutive hips in patients with femoral neck fractures. *Int Orthop.* 2012;36:711-7.

Author's Contributions:

Shehzad Ahmad: Data collection.
Ashfaq Ahmed: Data analysis & article writing
Jamil Ahmed: Data collection.
Rizwan Akram: Data collection.
Shahzad Javed: Supervision of study.
Naeem Ahmad: Supervision of study.
Amer Aziz: Supervision of study.

Conflict of Interest:

The authors declare that they have no conflict of interest.

Source of Funding:

None

How to cite this article:

Ahmad S, Ahmed A, Ahmed J, Akram R, Javed S, Ahmed N, Aziz A. Outcome of bipolar hemiarthroplasty: Analysis of using lateral and posteriolateral approach. *J Surg Pakistan.* 2017;22(1):16-19. doi:<http://dx.doi.org/10.21699/jsp.22.1.5>.