



E-ISSN: 2395-1958  
P-ISSN: 2706-6630  
IJOS 2022; 8(1): 800-804  
© 2022 IJOS  
[www.orthopaper.com](http://www.orthopaper.com)  
Received: 12-11-2021  
Accepted: 22-12-2021

**Shah AB**  
Department of Orthopaedics,  
BPKIHS, Dharan, Nepal

**Limbu A**  
Department of Orthopaedics,  
BPKIHS, Dharan, Nepal

**Baral P**  
Department of Orthopaedics,  
BPKIHS, Dharan, Nepal

**Pradhan SR.**  
Department of Orthopaedics,  
BPKIHS, Dharan, Nepal

**Corresponding Author:**  
**Shah AB**  
Department of Orthopaedics,  
BPKIHS, Dharan, Nepal

## Outcomes of Hemiarthroplasty via lateral approach in elderly patients

Shah AB, Limbu A, Baral P and Pradhan SR

DOI: <https://doi.org/10.22271/ortho.2022.v8.i1k.3102>

### Abstract

**Background:** Hip fractures are common and comprise 20% of operative workload of an orthopaedic trauma unit [1]. Hemiarthroplasty for hip fracture is one of the commonest procedures undertaken in Orthopaedics. A number of different surgical approaches may be used for the operation including the anterior, antero-lateral, lateral and posterior approach. Currently the two most commonly used approaches for hemiarthroplasty of the hip are the lateral [7] and the posterior approach [8].

**Methods:** Patients >60years with displaced neck of femur fracture without distal neurovascular deficit presenting and giving written and informed consent were evaluated clinically and radiologically. Total 42 patients underwent surgery with lateral approach. No mortality was observed among the cases. Modified Harris Hip Score (mHHS) was used to compare outcomes. Data was collected in the standard pro forma and patients were followed up at 2, 6 and 12 weeks.

**Results:** Modified Harris Hip Score at 12 weeks was  $66.90 \pm 9.41$  in Lateral approach. The mHHS has increased with successive follow up which was statistically significant. At 12 weeks according mHHS, 4.8% has excellent result, 7.1% had good result, 21.4% had fair result and 66.7% had relatively poor result. The quality of life of the patient has been improving in subsequent follow up and it was statistically significant.

**Conclusion:** Hemiarthroplasty via Lateral approach in elderly patients is safe and effective as operative outcome of the patient significantly increases with time. Post-operative pain, blood loss, prosthesis dislocation and other surgery related complications were minimum and the approach was more suitable for the patient.

**Keywords:** Hip, neck of femur, hemiarthroplasty

### Introduction

Hip fractures are common and comprise 20% of operative workload of an orthopedic trauma unit [1]. The lifetime risk of sustaining hip fracture is high and lies within range of 40% to 50% in women and 13% to 22% in men. Life expectancy is increasing worldwide, and these demographic changes can be expected to cause number of hip fractures occurring worldwide to increase from 1.66 million in 1990 to 6.26 million in 2050 [2]. Femoral neck fractures occurs most frequently in elderly female patients. They are uncommon in patients younger than 60 years.

The usual cause of these fracture is a simple fall with force being transmitted to the femoral neck applied via the greater trochanter, resulting in the fracture. The alternative mechanism is external rotation of the leg, with increasing tension in the anterior capsule and ilio-femoral ligaments. As neck rotates, the head remains fixed and a fracture occurs. Quantitative computer tomography has confirmed site-specific bone loss in the more proximal and supero-lateral areas, which accounts for site of fractures [3].

Most patients will have a history of simple, low energy fall as the cause of injury. In 2% to 3% cases, there is no history of trauma [4] and injury may be pathological or a stress fracture. Osteoporosis will be feature of the most patients with this injury and treatment may be required in the postoperative period. Physical findings may be limited in an undisplaced fracture. There may be no obvious deformity with only finding a painful range of motion of hip. In displaced femoral neck fractures, the affected leg is typically shortened and externally rotated. All motions of hip are painful.

Most femoral neck fractures require operative treatment. Possible exception includes stress fractures on the compression side of neck and femoral neck fractures in patients who are non-ambulatory and comfortable or are too infirm for operative treatment. The choice of implant and operation is largely dependent on the patient's physiological age. Patients with displaced femoral neck fracture who are older are treated with hemiarthroplasty or total hip replacement [5]. Hemiarthroplasty for hip fracture is one of the commonest procedures undertaken in Orthopaedics. In excess of one million such procedures are undertaken annually around the world [6].

A number of different surgical approaches may be used for the operation including the anterior, antero-lateral, lateral and posterior approach. Currently the two most commonly used approaches for hemiarthroplasty of the hip are the lateral [7] and the posterior approach [8]. The posterior approach is commonly done as it results in better regain of function as there is less damage to the hip muscles [9] whilst the anterior and lateral approaches have a lower risk of dislocation [10] unlike posterior approach.

The aim of the study is to assist in defining the functional outcomes of Hemiarthroplasty via Lateral approach for an acute hip fracture using a prospective descriptive study. The primary outcome measure was regained walking ability and Modified Harris Hip Score. Secondary outcome measures included mortality, ease of surgery, length of surgery, operative blood loss, blood transfusion, post-operative complications, hospital stay, prosthesis instability/mispositioning, need for subsequent revision surgery and the degree of residual pain.

Newer approaches are more rewarding and it overcomes the disadvantages of posterior approaches. Hence, we want to study a newer and different approach i.e. lateral approach.

## Methods

The study was conducted in the Department of Orthopedics, B.P. Koirala Institute of Health Sciences, a tertiary care hospital in Eastern Nepal, over a period of one year from October 2020 to September 2021. All the elderly patients, irrespective of gender, aged >60 years presenting at BPKIHS

within 3 weeks of injury with displaced intracapsular fracture neck of femur without polytrauma and previous hip pathology without distal neurovascular deficit presenting to Emergency and the outpatient Department of Orthopedics, BPKIHS and giving written and informed consent were taken into consideration. A total of 73 patients with neck of femur fractures attended our hospital. We excluded 31 patients: pathological fracture (2), associated polytrauma (4), < 60yrs (15), internal fixation performed (5) and not fit for surgery (5) from our study.

Enrollment of patient was done with the final diagnosis of neck of femur fracture. A thorough general, physical, systemic examinations, and lab investigations was carried out to look for underlying exclusion criteria.

A prior informed and written consent was taken from each patient after explaining about procedures, complications and possible outcomes. Procedure was done under adequate anesthesia after pre-anesthetic checkup (PAC) clearance. A detailed history regarding demographic profile, methods used, relevant clinical and radiological data was recorded in preset pro forma. Skin traction was immediately applied in Emergency and patient was planned for operation after pre-anesthetic checkup (PAC) clearance.

Patient were kept NPO for 8hrs and hemiarthroplasty was performed under all aseptic condition and adequate anesthesia. Patient were kept in lateral position for lateral approach. In this approach prophylactic antibiotics were given.

Patient were discharged on second postoperative day after wound inspection and patient were asked to follow at 2weeks, 6weeks, 3month and 6months at orthopedics outpatient department (OPD). The ambulatory status of the patient was individualized on case-to-case basis depending on patient's status, on surgical stability and bone quality etc.

Patient assessment on admission includes recording the patient's residential status, American Society of Anesthesia grade (ASA), mobility score and mental test score. Pre-operative and post-operative care protocols were taught to all patients and are encouraged to mobilize fully weight bearing with restriction of cross leg sitting and squatting.



Fig 1: Pre-operative



Fig 2: Post-operative

## Pre-operative (figure-1) and post-operative (figure-2) of the direct lateral approach

Collected data were entered in Microsoft excel 2016 and

converted into SPSS (statistical package for social sciences) 20 version for statistical analysis. For descriptive data-Proportion, percentage, mean, standard deviation was

calculated. Graphical and tabular presentation were also made. For Inferential data - Chi square test for categorical data, where sample are assumed to be normally distributed, were applied to find out the outcomes of hemiarthroplasty via lateral approach in elderly patients.

The 95% confidence interval for relative-risk and prevented fraction was calculated using Epi-info 6 software (WHO, Geneva) and intervention were tested by appropriate parametric and non-parametric statistical technique (example t-test, z-test, X<sup>2</sup>- test etc.) depending upon the nature of the variables in both the groups. The level of significance was set at  $P > 0.05$ , power of study was 80%. ( $\alpha=0.05$ ,  $\beta=0.8$ ). Ethical clearance was obtained from Institutional Research Committee (IRC).

## Results and Discussion

In our study the patients were elderly people with the mean age being  $74 \pm 9.57$  years. The mean age was 60 years in a study performed by Hovelius *et al.* [29]. Neck of femur fracture was more common in female (54.8%) than male (45.2%) which was similar to studies by Mukka *et al.* [28]. In a study by Singer *et al.* [2] the incidence of hip fractures showed a similar pattern in both genders, being uncommon in the young, with an exponential increase from the age of 65 years. The absolute male incidence, however, lags behind the female by approximately ten years.

In our study, it was found that the dominant extremity (right) was more commonly involved (54.8%) than non-dominant extremity. In a study performed by Mukka *et al.* [28] left side (55.6%) was injured more commonly than the right side (43.4%).

Our study showed that the patients presented with either a history of fall injury or RTA. Among them fall on level ground accounted for 61.9%, fall from height 33.3% and RTA for 4.8%. About 90% of hip fractures in elderly people result from a fall. [46] The risk of falling increases with age due to the increasing prevalence of risk factors for falling such as muscle weakness, abnormal gait or balance, neurologic disease, deteriorating eyesight, and medication with sedative or cardiovascular side effects [46, 47].

In our study, sub capital fracture was the most common type of neck of femur fracture (50%) followed by transcervical (28.6%) and basicervical (21.4%).

According to our study the mean operative time of surgery was  $70.71 \pm 14.63$  minutes. In a study performed by Hovelius *et al.* [29] even when the comparison had been confined to operations performed by senior surgeons, the average duration of surgery via posterior approach was 55 minutes and 112 minutes if surgery was performed by lateral approach. The surgical time was longer ( $90 \pm 21$  minutes) in the lateral approach according to Mukka *et al.* [28] probably due to the extra time spent by the surgeon in re-attaching the gluteus Medius muscle to the greater trochanter.

The interval between injury and presentation to the hospital was between 1 to 18 days ( $7.48 \pm 6.029$ ) in our study. The delay in presentation was probably due to the difficult terrain, lack of transportation facilities and low socio-economic background of patient.

The mean duration of hospital stay was  $3.26 \pm 1.149$  days in contrast to the study by Parker *et al.* [22] in which the mean duration was 18.5 days. The shorter duration of hospital stay in our study was probably due to less general and operative complications and fewer sample size.

No cases of sciatic nerve injury or superior gluteal nerve injury were reported in our study. Ramesh *et al.* [31] there was

persistent damage to the superior gluteal nerve in 11% of patients after lateral approach. This approach has been blamed for increasing the risk of damage to the superior gluteal nerve and to the gluteus Medius muscle.

In the study by Parker *et al.* [22], the 30 day and one year mortality for the posterior group was 5 (4.6%) and 20 (18.5%) respectively in lateral group. In the study by Mukka *et al.* [28] the mortality was high regardless of surgical approach. Seventy-two (39.3%) patients died during the study period of 2 years. In all the studies mortality was due to co-morbidities present in the operating patient. There was no mortality reported due to surgical complication in our study population. In our study, four cases postoperatively developed pneumonia and were treated with appropriate antibiotics. Parker *et al.* [22] observed 2 cases of pneumonia postoperatively after going through posterior approach.

Our study showed that the mean blood loss was  $256.67 \pm 63.47$  ml. Four patients required blood transfusion, 3 were transfused with 1 unit and 1 was transfused with 2 units of blood. The result, however, was contrast to the study of Hovelius *et al.* [29] where average blood loss was 650 ml, and the loss, as reflected by the amount transfused pre- and postoperatively, was clearly smaller with the posterior approach. In our group, moreover, no blood transfusion at all was required in 28 cases.

In our study, 19% of the patient had complications related to prosthesis. There was 1 case of intraoperative fracture which occurred during reduction of prosthesis. In a study by Parker *et al.* [22], there was 1 (0.9%) case, each of small and large operative femur fracture while performing posterior approach. The rate of superficial wound infection was about 9% (4 patients) in our study and was similar to the findings in a study performed by Parker *et al.* [22] in which 2 patients (1.9%) had superficial infection. Only one patient operated by lateral approach had dislocation of prosthesis which was similar to the result of the studies performed by Parker *et al.* [22] (0.9%), Hovelius *et al.* [29] (0.01%) and Mukka *et al.* [28] (0.012%).

Mukka *et al.* [28] proposed that the dislocation of prosthesis in posterior approach usually occurs with increased flexion and internal rotation associated with sitting or leaning forward. Biber *et al.* [23] conducted a retrospective study on 704 patients in 2012 to analyze early complications of hip hemiarthroplasty and concluded that there was no statistically significant difference between the posterior approach and the direct lateral approach regarding early surgical complications. However, the rates of the different complications studied varied significantly: the dislocation rate was higher after a posterior approach (3.9 vs 0.5%).

The mean head size of prostheses used was  $44.82 \pm 2.18$  mm. Forty-five mm bipolar prosthesis was used in about 31% of the cases followed by 47 mm size prosthesis (28.6%) and 43 mm and 41 mm size prosthesis (16.7%). Nayak *et al.* [30] performed an anatomical study of the dimension of acetabulum in the eastern Indian population and they found that the mean diameter of acetabulum was  $4.53 \pm 0.37$  cm on the right side and  $4.41 \pm 0.39$  cm on the left side, which correlates with the observations from our study.

In this study, uncemented hemi replacement arthroplasty was done in about 83.3% of the patients. In a study by Rogmark *et al.* [24], they found no difference in functional outcome between cemented and uncemented hemiarthroplasty.

The hip pain decreased subsequently in each follow up of the patient in our study. The residual pain in some patient was due to acetabular arthritis. This result is similar to the study by Parker *et al.* [22]



Fig 3: Pre-op X-ray



Fig 4: Post-op X-ray

Our study showed that there was statistically significant difference in functional outcome measured by Modified Harris Hip Score (mHHS) at 2<sup>nd</sup> post-operative day, 2 weeks, 6 weeks and 12 weeks. The score progressively improved on each follow up visits. The results were similar with the study of Parker *et al.* [22] and Mukka *et al.* [28]

**Summary**

It is estimated that the number of hip fractures worldwide will increase from the 1.26 million in 1990 to 2.6 million in 2025 and 4.5 million in the 2050 [6]. The impact of this phenomenon on the community is tremendous, in that there remains a 30% risk of mortality in elderly patients who sustain a hip fracture within one year and 80% in 8 years [45, 48] Patients must be immediately mobilized to limit short-term complications such as urinary tract infections, pneumonia, and deep venous thrombosis, and also to mitigate the decline in functional independence.

Hemiarthroplasty is the treatment of choice in elderly patients with displaced intracapsular neck of femur (NOF) fractures. Hemiarthroplasty helps immediate post-operative mobilization of the patient and prevents the complication related to immobilization.

The main aim of the study was to find out the functional outcome of lateral approach with Modified Harris Hip Score. The study also evaluates the intraoperative parameters and post-operative complication of Hemiarthroplasty via lateral approach. Total 42 patients underwent surgery with lateral approach. No mortality was observed among the cases. Modified Harris Hip Score (mHHS) was used to compare outcomes. Data was collected in the standard pro forma and patients were followed up at 2, 6 and 12 weeks.

1. Mean age of the study group was 74±9.57 years.
2. Out of total 42 patients, 23(54.8%) were female patients and male patients were 19 (45.2%).
3. Right side (54.8%) was involved more than left side.
4. The patients presented with a history of fall on level ground, fall from height and RTA. Among them 61.9% have history of fall on level ground, 33.3% fall from height and 4.8% RTA.
5. Mean time of presentation after injury was 7.48±6.029 days.
6. Mean injury to surgery time was 3.69±2.73 days.
7. Mean hospital stay was 3.26±1.149.
8. Mean operative was 70.71±14.63 minutes.
9. Mean blood loss was 256.67±63.47 ml.
10. There was no case of post-operative sciatic nerve injury.
11. Out of total patient 50% had sub capital, 28.6% transcervical and 21.4% basicervical neck of femur fracture.

12. (2.4%) in had intraoperative fracture during reduction of the prothesis for which cemented HRA was done
13. (9.5%) had postoperative superficial wound infection and was controlled with intravenous antibiotics and regular dressing. Wound hematoma as complication was reported in 2(4.8%) cases.
14. (4%) of patient had prothesis dislocation after discharge. Close reduction under general anesthesia was tried but failed. So open reduction was done.
15. The most common prothesis used was 45 mm (31%) followed by 47 mm.
16. In our study 83.3% cases were treated with uncemented HA. Cemented hemiarthroplasty (16.7%) was done in cases in which the prothesis was not press-fit.
17. No mortality was observed.
18. Hip pain in the group decreases on subsequent follow up. At 12 weeks mean VAS score was 0.19±0.397.
19. Modified Harris Hip Score at 12 weeks was 66.90±9.41 in Lateral approach. The mHHS has increased with successive follow up which was statistically significant.
20. At 12 weeks according mHHS, 4.8% has excellent result, 7.1% had good result, 21.4% had fair result and 66.7% had relatively poor result. The quality of life of the patient has been improving in subsequent follow up and it was statistically significant.

**Table 1:** Pain in hip (VAS) on subsequent follow up (n=42)

S. N.	Post-operative (day/week)	Median VAS score	VAS score (Mean ± SD)	p-value*
1.	1 <sup>st</sup> day	7	7.48±0.505	
2.	2 <sup>nd</sup> week	2	1.79±1.180	
3.	6 <sup>th</sup> week	1	0.60±0.587	
4.	12 <sup>th</sup> week	0	0.19±0.397	

**Table 2:** Modified Harris Hip Score on subsequent follow up (n=42)

S. N.	Post-operative (day/week)	mHHS (Mean ± SD)	p-value*
1	2 <sup>nd</sup> day	18.6±2.176	
2	2 <sup>nd</sup> week	37.63±3.72	
3	6 <sup>th</sup> week	52.31±6.59	
4	12 <sup>th</sup> week	66.90±9.41	

**Conclusion**

Hemiarthroplasty via Lateral approach in elderly patients is safe and effective as operative outcome of the patient significantly increases with time. Early surgical complications after Hemiarthroplasty may be the origin of cascades leading to general complications and increased mortality. This is why their prevention is especially important in orthogeriatric. Post-operative pain, blood loss, prothesis dislocation and other surgery related complications were minimum and the

