



## GLUTEUS MEDIUS SPARING LATERAL VERSUS POSTERIOR APPROACH FOR CEMENTED HEMIARTHROPLASTY IN FEMORAL NECK FRACTURE.

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**ABSTRACT** Hemiarthroplasty is a preferred method of treatment for fracture neck femur patients of more than 60 years of age. There are various approaches described for performing this procedure most popular among these are Posterior, Lateral and Anterior. Anterior approach is newer among these and difficult to expertise, moreover it requires special table for handling of proximal femur and component placement. Posterior Approach though most popular and having longest track record has been challenged by some surgeons for risk of prosthesis dislocation. Lateral approach on other hand avoids posterior capsular breach so decreases the risk of dislocation. However, classic lateral approach compromise gluteus medius resulting in abductor weakness and lurch. In present study we used modified lateral approach to get rid of abductor lurch in which gluteus medius was not incised rather it retracted posteriorly after blunt dissection. The functional results were better in modified lateral approach at initial follow ups but results were comparable in long term follow up. However, Operative time and blood loss was found to be higher in modified lateral approach.

### KEYWORDS :

#### INTRODUCTION

Hemiarthroplasty (HA) is a common treatment choice for displaced fragility hip fractures. HA enables immediate full weight-bearing without the risk of typical complications related to internal fixation, including avascular necrosis and non-union. Moreover, in patients older than 60 years, HA results in fewer reoperations compared with internal fixation [1, 2]. Furthermore, arthroplasty is considered a better option for previously independent and healthy patients due to the functional results, despite an increased incidence of hip dislocation [3]. HA is indicated in patients whose self-sufficiency and physical activity are limited [4]. Financial burden to patients is lesser in HA than to Total Hip Arthroplasty (THA). The best approach for hip joint arthroplasty, however, remains controversial.

The anterior approach (Smith-Petersen) utilizes the tissue plane between the sartorius and tensor fasciae latae superficially and between the rectus femoris and gluteus medius in deep dissection [5]. The anterolateral approach (Watson-Jones) utilizes the intermuscular plane between the tensor fasciae latae and gluteus medius [6]. The lateral approach includes separating the gluteus medius and vastus lateralis insertions from the greater trochanteric insertions, which are attached after prosthesis implantation into their original position [7]. The posterior approach includes separating the gluteus maximus muscle and release of external rotators from the femoral insertion [8].

Each approach has advantages and a different spectrum of complications. Previously conducted studies of hip fracture patients treated with HA indicate that the posterior approach increases the risk of hip dislocation and reoperation compared to the lateral approach [9, 10,11].

#### OBJECTIVES

The aim of this study was to compare the functional outcomes and complications modified lateral approach versus posterior approach for hemiarthroplasty.

#### METHODOLOGY

This is a prospective comparative study carried out at our institute which is a tertiary care centre located in central India. Study population consists of 40 consecutive patients of fracture neck femur treated with hemiarthroplasty between March 2018 to March 2021. Average follow-up period was 1 year (range 10 to 18 months). Valid consent was taken from all patients which included opting HA over THA due to financial constraints.

#### Inclusion Criteria:

All patients aged  $\geq 60$  and  $< 90$  years having suffering from fracture neck of femur, without having severe comorbidities.

#### Exclusion Criteria:

Patients younger than 60 and older than 90 years, patients with severe comorbidities and patients not willing to participate in the study.

#### Study Population:

A total 40 patients who met inclusion criteria were divided into two groups. A randomisation attempt was made by allocating each patient to either of the groups depending on the criteria of odd or even hospital number. Group 1 consisted of 20 patients who underwent hemiarthroplasty by posterior approach. Group 2 consisted of 20 patients who underwent hemiarthroplasty by modified lateral approach. All the patients were operated in lateral decubitus position. All the patients were operated by same orthopaedic surgeon. Fixed Bipolar stem of same manufacturer used for all patients.

#### Posterior Approach:

Under spinal or epidural anaesthesia patient mounted in lateral decubitus position. Incision given centering over greater trochanter extended 5 cm distally straight in line of shaft and proximally incision curved slightly posteriorly towards PSIS. Fascia lata incised in line of skin incision, trochanteric bursa cleared, short external rotators tagged and cutted leaving around 1 cm margin from insertion. Capsulotomy done in T or Y fashion, limb rotated to produce 90° internal rotation at hip to allow neck delivery posteriorly out of capsule. Neck cut made leaving 1-2 cm calcar, head delivered and size measured. Proximal femur reaming, rasping and canal preparation done. Cementing done and appropriate size prosthesis inserted in femur canal maintaining desired ante version and valgus alignment. Prosthesis head reduced in acetabulum after stem well fixed in canal with cement. Wound washed thoroughly, capsule repaired, rotators fixed to insertion site and soft tissues closed in layers. Aseptic dressing done.

#### Modified Lateral Approach:

Under spinal or epidural anaesthesia patient mounted in lateral decubitus position. Straight Incision given taking greater trochanter as centre. Incision extending around 5 cm proximally and 5 cm distally to GT. Subcutaneous tissue retracted, fascia lata dissected in line of skin incision, gluteus medius identified and retracted posteriorly with a retractor after blunt dissection for making it free from gluteus minimus. Gluteus minimus along with capsule dissected in T or Y shape fashion. Napkin ring cut at femoral neck given to make sufficient

space for head delivery, corkscrew fixed to head, ligamentum teres and capsule all around dissected, head delivered and size measured. Affected side leg allowed to fall anteriorly producing external rotation at hip which help in proximal femur delivery anteriorly out of capsule. Proximal femur shifted further anterior and lateral by placing a extra leverage femoral elevator beneath greater trochanter. Final neck cut taken leaving 1-2 cm of calcar. Reaming and rasping of proximal femur done, canal preparation and cementing done, appropriate size stem with head size same as anatomical head fixed in femoral canal. Cement protruded out of canal removed, acetabular side cleared and prosthesis reduced in acetabular cup after confirming that cement is fully solidify. Wound thoroughly washed, capsule fascia and skin closed in layers over a negative suction drain. Aseptic dressing done.

**RESULTS:**

**Table 1: Demographic and clinical data**

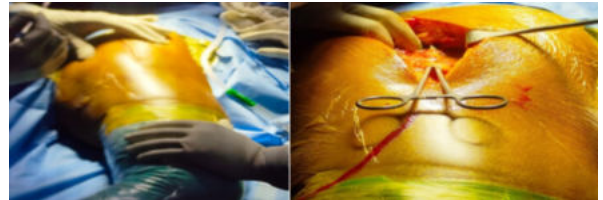
Parameters	Group 1	Group 2
Age in years	68.9 ± 6.78	69.21 ± 5.87
Male/Female	12/8	11/9
Involvement of side: Right side/Left side	11/9	8/12
Low energy (fall)/High energy (RTA)	16/4	17/3
Subcapital/Transcervical/Basicervical	8/6/6	8/5/7
Duration of surgery in minutes	62.4 ± 4.12	72.12 ± 3.86
Average blood loss (ml)	504 ± 3.12	650 ± 3.38

**Table 2: Outcomes and complications in both the groups**

Parameters	Group 1	Group 2
Infections	1 (5%)	2 (10%)
Dislocation	0	0
Abductor lurch	0	0
Nerve injury	0	0
PPF	0	0
Mortality	0	0
Aseptic loosening	0	0
Acetabular erosion	0	0
DVT	0	0
Pulmonary embolism	0	0

**Table 3: Functional results evaluation using Harris Hip Score**

Parameters	Group 1		Group 2	
	Excellent	Good	Excellent	Good
At 1 <sup>st</sup> month follow up	Excellent	0	Excellent	0
	Good	6	Good	8
	Fair	13	Fair	11
	Poor	1	Poor	1
At 2 <sup>nd</sup> month follow up	Excellent	0	Excellent	0
	Good	11	Good	13
	Fair	9	Fair	7
	Poor	0	Poor	0
At 1 year follow up	Excellent	2	Excellent	2
	Good	15	Good	14
	Fair	3	Fair	4
	Poor	0	Poor	0



**Positioning And Incision Group 2**      **Surgical exposure with intact gluteus medius tendon group 2**  
**Delivered head**      **Proximal femur lifting with femoral elevator for canal preparation**

**Demographic**

Mean age of patients in group 1 was 68.9+/-6.78 years and 69.21+/-5.87 years in group 2. Male percentage in group 1 was 60% while 55% in group 2. Right extremity involved more 60% in group 1 while left involved more 55% in group 2. No case of bilateral fracture neck of femur reported in our study.

**Fracture Pattern:**

Low energy fractures comprising 80% in group 1 and 85% in group 2. Fracture pattern was almost comparable in both groups.

**Intraoperative Parameters:**

Mean surgical time in group 1 was 62.14 +/-4.12 minutes while 72.12 +/-3.86 minutes in group 2.

Average blood loss in group 1 was 504+/-3.12 ml while 650+/-3.38 ml in group 2.

**Complications**

One patient (5%) in group 1 got superficial wound infection and 2 patients(10%) in group 2 got serous discharge which managed by debridement and drain placement.

**Functional Results**

Functional results of both groups are evaluated using Harris Hip Score on every month till 1 year. It is observed that functional results were better in group 2 in initial follow ups while functional results were comparable in both groups at 1 year follow up.

**DISCUSSION:**

Hip joint exposure for arthroplasty can be performed by various approaches. Long standing debate for most preferable approach is still ongoing. Most commonly performed approaches for arthroplasty are Posterior, Lateral and Anterior. There are multiple aspects which are considered for meriting one approach higher than others. Most preferred scoring system for functional outcome is Harris Hip Score(HHS) while Visual Analogue Scale (VAS) is commonly used to assess pain severity.

A meta-analysis revealed that the most effective approach for improving VAS scores was the LA.<sup>12</sup>

Singh's et al in his comparative study of posterior versus lateral approach observed that the improvement in HHSs was higher for both surgical approaches than the minimal clinically important difference reported<sup>13</sup>

Same result observed in our study at 1 year follow up Gore et al. found reduced abductor muscle strength in the LA group.<sup>14</sup>

This is the rationale underlying our technique, which aims to spare bone and soft tissues while optimizing hip biomechanics, through the use of mini-open prostheses procedure.<sup>15</sup>

Same rationale for our study in which we used minimally invasive modified lateral approach for HA.

**CONCLUSION**

Gluteus medius sparing lateral approach is a newer modification. This approach found better in terms of muscle preservation and avoiding posterior capsular weakness but needs expertization as delivering head and handling proximal femur with attached gluteus medius is bit difficult, time consuming and associated with more blood loss.

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