



**ORIGINAL RESEARCH PAPER**

**Orthopaedics**

**EFFECTS ON EXTERNAL ROTATOR MUSCLE STRENGTH IN NECK OF FEMUR FRACTURE PATIENTS OPERATED WITH SOUTHERN MOORE APPROACH FOR BIPOLAR HEMIARTHROPLASTY OF HIP**

**KEY WORDS:** muscle strength, Southern moore, Augustssons Strength test.

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**ABSTRACT**

**Introduction:** Neck of femur fracture is one of the most common fractures of elderly age group. Bipolar Hemiarthroplasty of Hip is most widely accepted treatment protocol. Posterior (Southern moore) approach is one of the widely used approach all over the world. In this approach Short external rotators are detached from their insertion and reattached. Hence there is a need to assess the function of External rotation of Hip post operatively. **Methods:** A Prospective study was carried out in patients with Neck of femur fracture who underwent Bipolar Hemiarthroplasty of Hip with Southern moore approach from May 2021 to May 2022 in a single institution. All patients were followed up and assessed at 6 weeks, 3 months and 6 months and function of short external rotators was assessed with Augustssons Strength test. Control for the muscle strength was considered opposite (Normal) side of hip. Patients with Any other ipsilateral fractures were excluded. Analysis of the data was done for the external rotator muscle strength at 6 weeks, 3 months and 6 months with comparison to normal hip of patient. **Results:** The overall mean age was 69 years. All the patient were followed up till 6 months post operatively. There was reduced strength of short external rotators in all the patients compared to normal hip at 6 weeks, with no significant difference in strength at 3 months. 12 out of 13 had equal muscle strength at 6 months. **Conclusion:** This study concludes that Detaching of Short external rotator in southern moore approach does not affect the muscle strength at 6 months. However it is found to be weaker in initial month.

**INTRODUCTION**

Femoral neck fractures account for 50 % of hip fractures and are common in the elderly beyond the age of 70 years. The primary goal of treatment of neck of femur fracture is to return the patient to his or her pre-fracture functional status. Unipolar hemiarthroplasty has the complications of persistent pain and protrusion acetabuli which led many surgeons to choose a bipolar system. Bipolar Hemiarthroplasty of Hip is most widely accepted treatment protocol. There are many different approaches to do Bipolar Hemiarthroplasty of Hip and Posterior (Southern moore) approach is one of the widely used approach all over the world. Southern moore approach gives a better exposure to the hip and does not interfere with the abductor mechanism of the hip hence, less chances of abductor lurch. In this approach Short external rotators are detached from their insertion and reattached. Hence there is a need to assess the function of External rotation of Hip post operatively.

**AIM and OBJECTIVES**

The aim of this Study was to evaluate the weakness of External Rotation of Hip following Southern moore approach.

- 1) To assess the External rotation muscle strength of both Affected (Operated) side and Normal side.
- 2) To assess the improvement or deterioration of muscle strength on operated side over the time period.

**Methodology**

**Study Design:** Prospective Comparative study

**Study Settings:** All the patients aged between 60 to 75 years coming to the Department of Orthopaedics OPD and Casualty of Yenepoya Medical College Hospital, Diagnosed with fracture neck of femur and planned to be operated with either posterior approach of Hemiarthroplasty of Hip will be included in the study

**Sampling technique:** Convenient sampling.

**Inclusion criteria**

- Patients with fracture neck of femur
- Fracture Pattern that mandate the need for

Hemiarthroplasty as opposed to osteosynthesis

- Posterior approach
- May 2021 to May 2022

**Exclusion criteria**

- Mentally retarded (Uncooperative for mobilisation protocol)
- Patients with other musculoskeletal disorders
- Ipsilateral Lower limb fractures
- Pathological fracture secondary to a malignant disease.

**DATA COLLECTION METHODS**

**PREOPERATIVE EVALUATION :** Clinical Preoperatively the patients were evaluated. Any fixed deformities and limb length discrepancy was noted.

**Investigations:** Routine investigations and preoperative radiographic assessment X ray Pelvis of both hips were .

**Preparation of Patient:** On the day of surgery, surgical site is prepared using povidone-iodine solution and draped with sterile sheets and brought to the operating room where a final preparation is done. Prophylactic antibiotic is given 30 minutes prior to surgery. All the patient were given Cefoperazone + Tazobactam (1.125 gm IV)

**Posterior approach:**

About 10 to 15 cm curved incision on the posterior aspect of the greater trochanter.



incise the fascia latae, lengthen the fascial l incision superiorly in line with the skin incision and split the fibers of the gluteus maximus blunt dissection.



Internally rotate the hip to put short external rotator muscles on a stretch and to pull the operative field away from the sciatic nerve.



then detach the muscles close to their femoral insertion and

reflect them backward.



The posterior aspect of the hip joint capsule is now fully exposed. hip joint capsule incised with a T-shaped fashion, dislocation achieved by internal rotation, flexion and adduction.



Remove the femoral head with fractured neck, and excellent exposure of the acetabulum is obtained.

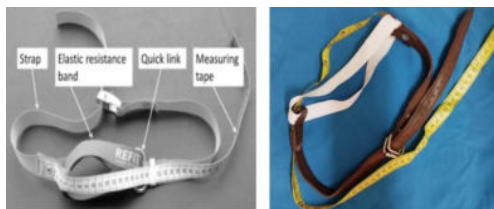
**POSTOPERATIVE CARE AND REHABILITATION:** Antibiotics of fifth generation intravenous cephalosporin for the first 5 days.

Rehabilitation protocol: Postoperatively exercises to be practiced are taught by the physiotherapist. Patients are started on Quadriceps and gluteal strengthening exercises with ankle dorsiflexion and plantar flexion from post operative day 2. Patient is advised 6 weeks walking with walker support. After the surgery radiological evaluation with plain x-ray pelvis both hips and proximal femur - AP view was done for all patients at regular intervals for position on prosthesis and to rule out any periprosthetic infections.

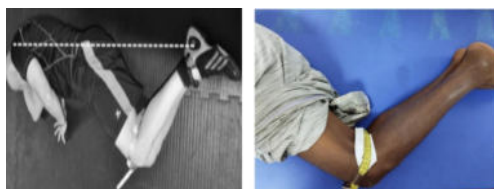
**FOLLOW UP:** Prospective patients were reviewed regularly at 6 weeks, 3 months and 6 months follow up. Postoperative functional outcome was assessed with Augstsson Strength Test at 6 weeks, at 3 months and at 6 months.

Augstsson's strength test 2

- It is a dynamic clinical strength test for hip external rotator muscles.
- The extension of an elastic resistance band is proportional to the force, thus there is a linear relationship between the applied force and the resulting extension
- Thus in order to investigate the corresponding force production, based on the distance achieved by the subjects, the elastic resistance band loop was hanged from a stand
- The Difference between two side was Delta Augstsson score ; which is directly proportional to the weakness of the External rotators.



**FIGURE 1: (Augstsson's device)**



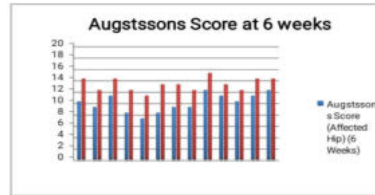
**FIGURE 2: Position for Augstsson's Strength test**

**RESULT AND ANALYSIS**

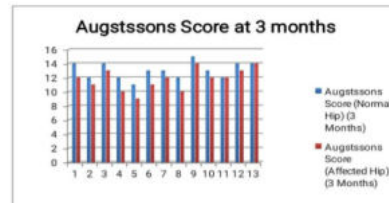
Out of the 13 patients evaluated, 7 were males and 6 were females with overall mean age was 69 years.

Augstsson's score were evaluated at 6 weeks, 3 months and 6 months and the graph were plotted adjacent to each other for the affected hip and normal hip side for better comparison.

**Figure 3: Augstsson's Score (6 Weeks) of both normal and affected hip.**

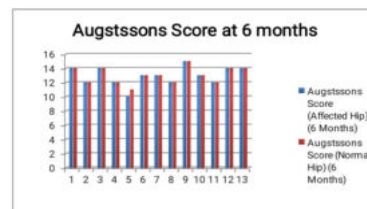


At 6 weeks, Mean over affected side 9.7692 (1.59), and normal side 13.00 (1.16), Delta augstsson score 3.2308. So at 6 weeks significant weakness (P <0.001)



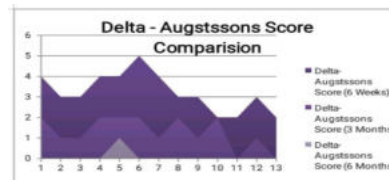
**Figure 4: Augstsson's Score (3 months) of both normal and affected hip.**

At 3 months, Mean over affected side 11.77 (1.53), and normal side 13.00 (1.16), Delta augstsson score 1.23077. So no significant weakness (P 0.623)



**Figure 5: Augstsson's Score (6 months) of both normal and affected hip.**

At 6 months, Mean over affected side 12.9231 (1.32), and normal side 13.00 (1.16), Delta augstsson score 0.08. P value: 0.3371.e. No significant weakness.



**Figure6 :Delta Augstsson's Score at 6weeks, 3 months and 6 months.**

**Discussion:**

Patients operated with hemiarthroplasty using the posterior(Southern moore) approach had less pain, were more satisfied, and had a better quality of life at the end of 6 months.

Nicholas d Downing<sup>3</sup> et al, compared hip abductor strength in Posterior and Lateral approach operated patients post THR and his results showed significant weakness (p 0.89) in lateral approach group at 3 months and 12 months. His study was more focused on trendelenburg component post operatively. Hakan Borg<sup>4</sup> et a, conducted a study in external rotation strength deficit after resurfacing surgery with posterior approach and results showed significant weakness of external rotator muscles (decrease about 29%) at 3 months post operatively. These results favours our study results.

Taku ukai<sup>5</sup> et al, did a study comparing the Posterior and anterolateral approach for total hip arthroplasty and concluded that External rotation from 2 weeks to 6 months was weaker in posterior approach group. These findings are similar with our study.

**Conclusion:**

- This study concludes that Detaching of Short external rotator in southern moore approach does not affect the muscle strength at 6 months. However it is found to be weaker in initial months at 6 weeks and 3 months.

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