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Study of functional outcomes of anterolateral approach of bipolar hip hemiarthroplasty for management of fracture neck of femur in elderly patients

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Abstract

Introduction: Hip hemiarthroplasty is the standard of care for the management of fracture of the femoral neck in elderly patients. While many approaches have been described each with its own set of advantages and disadvantages, final decision regarding the approach to be used often depends on the operating surgeon. This article discusses the functional outcomes of elderly patients with neck of femur fractures operated with bipolar hemiarthroplasty in a tertiary care centre.

Materials and Methods: A prospective interventional study was conducted over a duration of 18 months after getting the approval from the institutional ethics committee at a tertiary care centre, consisting of 30 elderly patients (age >60 years) with neck of femur fractures. After required pre-operative evaluation patients were operated with bipolar hemiarthroplasty for the management of the femoral neck fracture. Intra-operative parameters like blood loss and duration of surgery were noted. Post-operative complications such as suture site infection, dislocation, nerve injury, deep venous thrombosis were studied. The improvement in functional outcome was evaluated comparing the pre-operative Harris Hip Score with that at the time of discharge, at 1 month follow up and six months follow up using standard statistical methods.

Results: The average operation lasted 68.97 minutes, and 142.67 ml of blood were lost on average. There were no difficulties throughout the operation. There were three occurrences of wound infection among the postoperative sequelae. The typical length of a hospital stay was 12.07 days, whereas the average length of a bed stay was 3.6 days. The average Harris hip score before surgery was 45. The mean Harris hip score was 66 at the time of discharge, and at one month after surgery, it had increased to 75.60, a statistically significant improvement. The mean Harris hip score was 85.77 at six months following surgery, indicating a successful outcome from the intervention. Statistics showed that the improvement was substantial ($p < 0.05$).

Conclusion: Anterolateral approaches can reduce operating trauma, operation time, hospital stay, and bedtime. In turn, this can lower the associated perioperative risk in the treatment of femoral neck fractures in elderly patients undergoing hemiarthroplasty and can be used as an alternative approach for the same.

Keywords: Anterolateral approach, neck of femur, bipolar hip hemiarthroplasty

Introduction

Hip hemiarthroplasty is a surgical procedure commonly used to treat fractures of the femoral neck in older patients. This procedure involves replacing the head of the femur with a prosthetic implant, while preserving the patient's own acetabulum (socket of the hip joint). There are several surgical approaches that can be used to access the hip joint, each with its own pros and cons^[1].

The most commonly used approaches are the posterior (Southern Moore's) approach and the lateral (Hardinge's) approach. However, the Watson-Jones anterolateral approach has gained popularity in recent years due to its potential benefits over other approaches. This approach involves making an incision on the lateral aspect of the hip and dissecting through the plane between tensor fascia lata and gluteus medius muscle to access the hip joint^[2].

Assessing clinical and functional outcomes after hip hemiarthroplasty is essential in determining the success of the surgery and in guiding postoperative rehabilitation. It is

important to evaluate the impact of the surgical approach on intraoperative variables such as duration of surgery, intraoperative blood loss, length of bed stay, duration of hospital stay and functional outcomes, including pain relief, range of motion, and mobility.

In this article, we will focus on the function outcomes of 30 patients who were operated using the Watson-Jones anterolateral approach for hip hemiarthroplasty following a femoral neck fracture. This study aims to provide evidence for the effectiveness of this approach and to guide the selection of surgical approach in hip hemiarthroplasty.

Materials and Methods

Study Design

This study is a prospective interventional study of patients aged >60 years who suffered neck of femur fracture and underwent hip hemiarthroplasty using the anterolateral Watson approach between January 2020 and June 2022 in a tertiary care centre in India. The study was approved by the institutional ethics committee.

Patient Selection Criteria

The patients aged 60 years or older who underwent hip hemiarthroplasty using the anterolateral Watson approach for the management of femoral neck fractures, willingly given consent for the study were included. Patients with pathological fractures, previous hip surgeries, preoperatively bedridden or with severe co-morbidities rendering them unfit for surgery were excluded from the study.

Surgical Technique ^[3]

All surgeries were performed by the same surgeon using the anterolateral Watson approach. The patient was positioned in the lateral decubitus position, and an anteriorly curved skin incision was made on the lateral aspect of hip extending from superior aspect of the greater trochanter centred over it and extending along the femoral shaft. Soft tissue was dissected and a plane was created between gluteus medius muscle and the tensor fascia lata muscle using retractors, and the hip joint was exposed after anterior capsulotomy. The femoral head was excised, and the femoral canal was reamed. A bipolar prosthesis was inserted. The wound was then closed in layers.

Instrumentation used for the procedure



Image 1: Instrumentation used for the procedure



Image 2: Painting and draping of the patient being done



Image 3: Positioning of patient



Image 4: Implant insertion

Outcome Measures

The primary outcome measure was the functional status of the patients, which was evaluated using the Harris hip score at 1, 3 and 6 months postoperatively [4, 5, 6].

Data Analysis

Descriptive statistics were used to analyze the demographic and clinical characteristics of the patients. Changes in the Harris hip score were analyzed. Radiographic parameters were compared using ANOVA and paired t-tests. A p-value less than 0.05 was considered statistically significant.

Ethical Considerations

This study was approved by the institutional ethics committee, and all patients provided informed consent for the surgery and the use of their pictures and records for research purposes. Patient confidentiality was maintained throughout the study.

Observations

Demographic Data

A total of 30 patients met the inclusion criteria and were included in the study. The following demographics were noted.

The participants in the study were in the range of 61 to 80 years, the average age was 65.8 (\pm 3.64) years. 60 percent (18) of the enrolled patients were females. Right side was fractured in 19 (63.3%) participants and Left side was fractured in 11 (36.7%) participants and associated trauma energy was high in 5 (16.7%) participants and trauma energy was low in 25 (83.3%) participants. Subcapital fracture present in maximum 15 (50%) participants, Transcervical in 9 (30%) participants & Basicervical in 6 (20%) participants.

Surgical Outcomes

The mean operative time was 68.97 minutes, and the mean blood loss was 142.67 ml. There were no intraoperative complications. Postoperative complications included three cases of wound infection, which were treated with antibiotics. Average duration of bed stay was 3.6 days and mean duration of hospital stay was 12.07 days.

Functional Outcomes

The mean preoperative mean Harris hip score was 45. At the time of discharge, the mean Harris hip score was 66 and 1 month postoperatively, the mean Harris hip score improved to 75.60. At 6 months postoperatively, the mean Harris hip score was 85.77. These improvements were statistically significant ($p < 0.05$).

Complications

There were 1 case of dislocation which was managed with closed reduction and immobilization. No cases of nerve injury or deep vein thrombosis were recorded. Three patients developed wound infection, which was treated with antibiotics.

Discussion

Interpretation of Results

The results of this study demonstrate that the anterolateral Watson Jones approach for hip hemiarthroplasty is an effective and safe approach for treating femoral neck fractures in elderly patients. Demographic variables in the study such as average age of patient, sex distribution of the study population, side distribution of the fracture, energy associated

with the underlying trauma were consistent with previous studies and were in close resemblance to study conducted by Aparajit *et al.* [7]

Duration of surgery was found to be comparable to that in previous conducted study by Juneja *et al.* and was also lesser than what was required for posterior approach as found by the same study [8].

Mean intraoperative blood loss (142.67ml) was found to be significantly lesser than in other study, by Wayan Subawa which has shown the mean blood loss to be 192.14ml in the anterolateral and 288.10 ml in posterior approaches respectively.

Duration of bed and hospital stays comparable to other studies. The functional outcomes, as measured by the Harris hip score, showed significant improvements at discharge, 1, and 6 months postoperatively [8].

Surgery through the anterolateral approach potentially leads to a reduction in operative trauma, less blood loss, smaller soft tissue wound, a reduction in postoperative pain, and earlier mobilization accomplished by preserving muscle insertions of gluteus medius and minimus. Theoretically, these improvements may result in shorter hospitalization, convalescence, and rehabilitation periods [9, 10].

Reduced pain, reduced blood loss and shorter stay in the hospital have been described with the anterolateral approach due to muscle sparing properties of this approach [11, 12, 13]. Though the study done by Rottinger *et al.* have shown evidence of Superior Gluteal Nerve palsy post operatively in patients with anterolateral approach [14], no such incidence was found in our study.

Conclusion

In conclusion, the anterolateral Watson approach for hip hemiarthroplasty appears to be a safe and effective option for treating femoral neck fractures in elderly patients. The approach can lead to significant improvements intraoperative parameters and functional outcomes and has a low risk of complications. However, further studies with larger sample sizes, longer follow-up periods, and control groups are needed to confirm these findings and compare the anterolateral Watson approach with other approaches.

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