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Functional Outcome And Quality Of Life After Bipolar Hemiarthroplasty In Patients Presenting With Neck Of Femur Fracture At Tertiary Care Hospital, Karachi

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ABSTRACT

Objective: To evaluate the functional outcomes and quality of life subsequent to bipolar hemiarthroplasty in individuals diagnosed with neck of femur fractures at a Tertiary Care Hospital located in Karachi. Methodology: This cross-sectional investigation was carried out within the Orthopedics Department at Civil Hospital, Karachi. The sample of 145 individuals (ranging in age from 45 to 80 years) diagnosed with Garden grade ≥1 femoral neck fractures and possessing an ASA classification of ≤2, who presented for medical evaluation within a 24-hour timeframe. After excluding patients with significant comorbidities, all participants underwent a bipolar hemiarthroplasty procedure. The evaluation of functional outcomes and quality of life was performed at a 12-week interval employing the Harris Hip Score and the SF-36, with the resultant data undergoing statistical analysis through the utilization of SPSS version 26 and the chi-square test ($p \leq 0.05$). Results: In a cohort of 145 patients the mean age of the participants was noted as 64.28 ± 11.66 years among them 36.6 were male while 63.4% female, bipolar hemiarthroplasty showed promising clinical results. At 12 weeks follow-up, 86.9% of participants achieved excellent or good Harris Hip Scores. Conclusion: Bipolar hemiarthroplasty has been shown to yield advantageous short-term functional outcomes and improvements in quality of life for patients afflicted with femoral neck fractures. A majority of individuals attained excellent to commendable hip functionality, accompanied by elevated scores in pain alleviation and social well-being as assessed by the SF-36. These results substantiate the utilization of bipolar hemiarthroplasty as a viable therapeutic intervention for the restoration of mobility and the enhancement of quality of life in suitably selected patients.

INTRODUCTION

Femoral neck fractures in older adults represent a significant orthopaedic challenge and are usually the result of low energy injuries or occur unintentionally due to decreased musculoskeletal strength [1]. The elderly have shown to be more vulnerable to falls due to the age-related decrease in muscular strength and balance, while risk factors include diabetes mellitus, previous hip fracture, renal induced hyperparathyroidism, and family history of hip fractures typically not due to osteoporosis [2]. Osteoporosis is still a documented risk factor, which predisposes bone to fracture on trauma [3].

Individuals with a prior incident of cerebrovascular accident exhibit a fourfold elevation in the likelihood of sustaining a hip fracture, attributable to recurrent falls and hemiosteoporosis affecting the affected limb [4]. Clinically, fractures of the femoral neck typically manifest with tenderness in the anterior region of the hip joint, limitations in range of motion, and slight external rotation or shortening of the limb, attributable to the intracapsular characteristics of the fracture and the supportive influence of the joint capsule [5,6]. While plain radiographs are usually sufficient for diagnosis, advanced imaging modalities like CT, MRI, or bone scans may be required in ambiguous cases [7,8].

While non-surgical management may be contemplated in instances involving minimally displaced fractures or in individuals deemed unfit for surgical intervention, operative treatment continues to be the prevailing standard of care for the majority of geriatric patients [9,10]. Surgical alternatives encompass a spectrum from internal fixation techniques to prosthetic replacements, which may include hemiarthroplasty (either unipolar or bipolar) or total hip arthroplasty [11,12]. Typically, undisplaced or minimally displaced fractures are managed with internal fixation, whereas displaced fractures warrant prosthetic replacement [13].

Bipolar hemiarthroplasty has demonstrated favorable functional outcomes, with Prasad et al. reporting results classified as excellent in 40% and good in 46.6% of cases [14]. Similarly, Malik et al. evaluated postoperative quality of life using the SF-36 tool, revealing satisfactory scores across physical, emotional, and mental health domains [15]. Despite the availability of global data, there persists a significant deficiency of localized evidence pertaining to postoperative functionality and quality of life among individuals undergoing bipolar hemiarthroplasty as a treatment for femoral neck fractures. This research endeavor aims to bridge this existing gap by systematically assessing outcomes within a tertiary care environment in Pakistan.

MATERIAL AND METHOD

This cross-sectional investigation was carried out within the Orthopedics Department at Civil Hospital, Karachi. A total of 145 patients aged 45–80 years of either gender who presented within 24 hours with femoral neck fractures classified as Garden grade ≥1 and American Society of Anesthesiologists (ASA) status ≤2 were included through non-probability consecutive sampling. Individuals were excluded from the study if they presented with inflammatory arthritis, metabolic bone disorders, thromboembolic conditions, malignancies, or substantial comorbidities, which included acute coronary syndrome, congestive heart failure, chronic hepatic or renal diseases, chronic obstructive pulmonary disease, or cerebrovascular accidents. Femoral neck fractures were operationally defined as cases presenting with pain score ≥6 on the Visual Analog Scale and proximal thigh tenderness, with radiographic evidence of any one or more of the following: Shenton's line disruption, prominence of the lesser trochanter, external rotation of the femur, or asymmetry of the lateral femoral neck/head.

Functional outcome was assessed 12 weeks postoperatively using the Harris Hip Score, which evaluates pain, function (gait, support, activities), range of motion, and deformity, and categorizes results as excellent (90–100), good (80–89), fair (70–79), or poor (<70). Quality of life was assessed using the SF-36 questionnaire at 12 weeks postoperatively, comprising 36 items across eight domains: physical functioning, role limitations due to physical and emotional problems, bodily pain, general health, vitality, social functioning, emotional well-being, and mental health. Following informed consent, all patients underwent bipolar hemiarthroplasty performed by a senior orthopedic surgeon using standardized surgical and rehabilitation protocols. The assembled dataset underwent analysis utilizing SPSS version 26; descriptive statistics were computed in relation to the mean accompanied by standard deviation and frequency expressed as a percentage; the relationships among variables were assessed employing the Chi-square test ($p \leq 0.05$).

RESULTS

In this investigation, 145 people participated, with an average age recorded at 64.28 ± 11.66 years (95% CI: 62.37–66.20), while the average BMI was found to be 25.95 ± 3.51 kg/m² (95% CI: 25.38 to 26.53). The assessment of quality of life was conducted utilizing the SF-36 instrument, which yielded an average functional capacity score of 31.53 ± 16.35 (95% CI: 28.85; 34.22), a physical aspects score of 75.80 ± 28.06 (95% CI: 71.19; 80.41), a pain score of 93.39 ± 8.36 (95% CI: 92.01; 94.76), and an overall general health status score of 71.59 ± 26.83 (95% CI: 67.18; 75.99). The assessment of physical health yielded a mean score of 67.50 ± 27.02 (with a 95% Confidence Interval ranging from 63.06 to 71.93), while the social well-being score was recorded at 88.69 ± 12.57 (with a 95% Confidence Interval between 86.63 and 90.75). Furthermore, the emotional well-being score was determined to be 83.54 ± 21.40 (with a 95% Confidence Interval of 80.02 to 87.05), and the mental health score was established at 78.82 ± 22.69 (with a 95% Confidence Interval spanning from 75.10 to 82.55). The average Harris Hip Score obtained was 86.92 ± 8.97 (95% Confidence Interval: 85.45–88.40). The participant demographic comprised individuals categorized as male (n = 53, 36.6%) and female (n = 92, 63.4%). In relation to smoking status, fifty participants (34.5%) were identified as smokers, while 95 participants (65.5%) were classified as non-smokers as shown in TABLE I.

Table II illustrates the distribution of functional outcomes among the cohort of 145 participants. A predominant number of patients exhibited positive results, with 67 individuals (46.2%) attaining a good functional outcome and 59 (40.7%) classified as having achieved an excellent outcome. Conversely, a smaller fraction displayed less favorable results, with 10 participants (6.9%) categorized as fair and 9 (6.2%) classified as having a poor functional outcome.

DISCUSSION

This investigation assessed the immediate functional results and overall quality of life subsequent to bipolar hemiarthroplasty in individuals suffering from femoral neck fractures and determined that the findings were predominantly positive. A significant proportion of participants attained either excellent or satisfactory outcomes on the Harris Hip Score, yielding a mean score of 86.92 ± 8.97. These results exhibit a strong correlation with the observations made by Prasad et al., who documented outstanding results in 40% and satisfactory outcomes in 46.6% of their cohort undergoing bipolar hemiarthroplasty [14], thereby reinforcing the reliability and efficacy of this surgical procedure in geriatric populations afflicted with displaced femoral neck fractures.

The construct of health-related quality of life, as evaluated through the SF-36 questionnaire, additionally indicated a favorable postoperative recovery trajectory. Participants exhibited elevated scores in various domains, including pain alleviation (mean: 93.39 ± 8.36), social functioning (88.69 ± 12.57), and emotional well-being (83.54 ± 21.40). Our findings are not surprising and are similar to the research performed by Malik et al., who also used the same type of measurement tool and reported similarly high scores across physical, emotional, and mental health domains in patients following bipolar hemiarthroplasty [15]. These comparisons further underscore the ability of the procedure to restore not just mobility, but also critical aspects of daily life and psychosocial health in older people.

In accordance with the ongoing global indications that postmenopausal osteoporosis and age-related bone loss result in an increased number of fragility fractures in women [3,4], this study included a considerable number of women, (63.4% female patients). Even so, the study mirrors the ongoing clinical trend to favour bipolar hemiarthroplasty for displaced fractures over internal fixation due to previously reported lower rates of avascular necrosis and non-union [11–13]. In addition, the positive results in this cohort may also be due to the early postoperative mobilization and implementing standardized surgical and rehabilitation protocols. An important strength of this study is the clear description of the methodology, including the use of validated outcome measures (Harris Hip Score and SF–36), standardized surgical techniques and predefined and objectively based inclusion and exclusion criteria to reduce potential confounding factors. Focus on a homogeneous patient population, treated by experienced orthopedic surgeons at a tertiary care center enhances internal validity and reflects actual clinical practice in the community setting. Importantly, this study adds to the sparse evidence base from Pakistan, yielding locally relevant data that can inform clinical management and health policy.Nevertheless, the research does possess certain constraints. As a single-center study, the results may lack applicability to larger or more heterogeneous populations. The cross-sectional methodology inhibits the examination of outcome variations over time and fails to establish causal relationships. The relatively short follow-up period of 12 weeks may fail to capture long-term complications such as prosthesis loosening, acetabular erosion, or sustained decline in quality of life. Moreover, the lack of a control or comparator cohort, such as individuals receiving total hip arthroplasty or internal fixation, constrains the capacity to assess relative efficacy. The dependence on self-reported quality of life metrics may engender bias, especially in contexts where patient literacy and health awareness exhibit considerable variability.

Despite these limitations, the study presents meaningful insights into the short-term functional recovery and quality of life achievable with bipolar hemiarthroplasty in appropriately selected patients. The results substantiate the sustained application of this intervention as a favored surgical alternative for geriatric patients exhibiting displaced femoral neck fractures. Subsequent inquiries ought to encompass prospective, multicenter investigations with extended follow-up periods and comparative cohorts to more accurately delineate the most effective surgical methodology for this demographic.

CONCLUSION

Bipolar hemiarthroplasty has been shown to yield advantageous short-term functional outcomes and improvements in quality of life for patients afflicted with femoral neck fractures. A majority of individuals attained excellent to commendable hip functionality, accompanied by elevated scores in pain alleviation and social well-being as assessed by the SF-36. These results

substantiate the utilization of bipolar hemiarthroplasty as a viable therapeutic intervention for the restoration of mobility and the enhancement of quality of life in suitably selected patients.

TABLE I: DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF STUDY PARTICIPANTS (N=145)

Mean ± SD		95% CI
Age in years= 64.28 ± 11.66		62.37----66.20
BMI in kg/m² = 25.95 ± 3.51		25.38----26.53
SF-36	**Functional capacity** = 31.53 ± 16.35	28.85----34.22
	Physical aspects = 75.80 ± 28.06	71.19----80.41
	Pain = 93.39 ± 8.36	92.01----94.76
	Overall health status = 71.59 ± 26.83	67.18----75.99
	Vitality = 67.50 ± 27.02	63.06----71.93
	Social aspects = 88.69 ± 12.57	86.63----90.75
	Emotional aspects = 83.54 ± 21.40	80.02----87.05
	Mental Health = 78.82 ± 22.69	75.10----82.55
Harris Hip Score = 86.92 ± 8.97		85.45----88.40
n (%)		
Gender	**Male**	53 (36.6)
	Female	92 (63.4)
Smoking Status	**Smoker**	50 (34.5)
	Non-Smoker	95 (65.5)

TABLE II: DISTRIBUTION OF FUNCTIONAL OUTCOME (N=145)

Functional Outcome	Frequency	Percentage
Poor	9	6.2
Fair	10	6.9
Good	67	46.2
Excellent	59	40.7

REFERENCES

1. Parker MJ. Fractures of the neck of the femur. *Trauma.* 2008;10:43–53.
2. Schmidt AH, Leighton R, Parvizi J, Sems A, Berry DJ. Optimal arthroplasty for femoral neck fractures: is total hip arthroplasty the answer? *J Orthop Trauma.* 2009;23:428–33.
3. Hopley C, Stengel D, Ekkernkamp A, Wich M. Primary total hip arthroplasty versus hemiarthroplasty for displaced intracapsular hip fractures in older patients: systematic review. *BMJ.* 2010;340:0.

4. Malik AA, Kell P, Khan WS, Ihsan KM, Dunkow P. Surgical management of fractured neck of femur. *J Perioper Pract.* 2009;19(3):100–4.
5. Kyle RF. Subcapital fractures: in the bucket or on top of the neck? *Orthopedics.* 2010;33:644.
6. Hedbeck CJ, Enocson A, Lapidus G, et al. Comparison of bipolar hemiarthroplasty with total hip arthroplasty for displaced femoral neck fractures: a concise four-year follow-up of a randomized trial. *J Bone Joint Surg Am.* 2011;93:445–50.
7. Ossendorf C, Scheyerer MJ, Wanner GA, et al. Treatment of femoral neck fractures in elderly patients over 60 years of age - which is the ideal modality of primary joint replacement? *Patient Saf Surg.* 2010;4:16.
8. Miller CP, Buerba RA, Leslie MP. Preoperative factors and early complications associated with hemiarthroplasty and total hip arthroplasty for displaced femoral neck fractures. *Geriatr Orthop Surg Rehabil.* 2014;5:73–81.
9. Dawson D, Milligan D, Callachand F, Cusick L. Hip hemi-arthroplasty vs total hip replacement for displaced intra-capsular hip fractures: retrospective age and sex matched cohort study. *Ulster Med J.* 2018;87:17–21.
10. Wang F, Zhang H, Zhang Z, Ma C, Feng X. Comparison of bipolar hemiarthroplasty and total hip arthroplasty for displaced femoral neck fractures in the healthy elderly: a meta-analysis. *BMC Musculoskelet Disord.* 2015;16:229.
11. Burgers PT, Van Geene AR, Van den Bekerom MP. Total hip arthroplasty versus hemiarthroplasty for displaced femoral neck fractures in the healthy elderly: a meta-analysis and systematic review of randomized trials. *Int Orthop.* 2012;36:1549–60.
12. Bhandari M, Devereaux PJ, Tornetta P. Operative management of displaced femoral neck fractures in elderly patients. An international survey. *J Bone Joint Surg Am.* 2005;87:2122–30.
13. Cordero-Ampuero J, de Dios M. What are the risk factors for infection in hemiarthroplasties and total hip arthroplasties? *Clin Orthop Relat Res.* 2010;468:3268–77.
14. Prasad VNK, Ghouse BM, Reddy BJC, Abhishek L. Comparative study of fracture neck of femur treated with unipolar and bipolar hemiarthroplasty. *J Evo Med Dental Sci.* 2015;4(22):3785–91.
15. Chikude T, Fujiki EN, Honda EK, Ono NK, Milani C. Assessment of quality of life among elderly patients with femoral neck fractures surgically treated by partial hip arthroplasty. *Acta Ortop Bras.* 2007;15(4):197–199.