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EVALUATION OF THE FUNCTIONAL OUTCOMES FOLLOWING MANAGEMENT OF INTRACAPSULAR FEMUR NECK FRACTURE USING CEMENTED BIPOLAR HEMIARTHROPLASTY

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ABSTRACT

Background: In the Department of Orthopedics, fractures of the intracapsular femur neck are frequently reported fractures. Good results have been seen in older participants with cemented bipolar hemiarthroplasty for the treatment of intracapsular femur neck fractures.

Aim: The purpose of this study was to assess functional results after cemented bipolar hemiarthroplasty for the treatment of an intracapsular femur neck fracture.

Methods: A total of twenty-eight individuals with an intracapsular femur neck fracture were included in this prospective clinical investigation. Following management, the Harris Hip Score was used to evaluate the results and classify them as follows: poor, fair, good, and exceptional.

Results: When the Harris Hip scores of the study subjects were graded, it was observed that 10.71% (n=3) of the subjects had poor scores, 25% (n=7) had fair scores, 50% (n=14) had good scores, and 14.28% (n=4) had excellent scores. Regarding the radiological characteristics of the research subjects, it was observed that 50% (n=14), 39.28% (n=11), and 10.71% (n=3) of the study subjects had radiological gradings of excellent, good, and poor, respectively. Out of the studied individuals, the ectopic eruption was observed in 17.85% (n=5) whereas it was absent in 82.14% (n=23) of the subjects. Of the study subjects, 46.42% (n = 13) had a neck shaft angle >140°, whereas 53.57% (n = 15) had a neck shaft angle between 110°-140°.

Conclusion: The current study found that cemented bipolar arthroplasty, which has good clinical outcomes in older individuals, is one of the best strategies to treat intracapsular femur neck fractures. It is essential to do ongoing radiological and clinical testing to evaluate the problems.

Keywords: Hemiarthroplasty, Harris Hip Score, Femoral Neck, Femoral Neck Fracture.

INTRODUCTION

The replacement of the femoral head is a useful management option for older patients with fractures. The effectiveness and clinical results evaluated after treatment, however, remain debatable. Hip fractures are very common worldwide; according to a 1990 survey, 1.3 million fractures are reported annually.

This incidence is predicted to rise to 4.5 million by the end of 2050, with Africa and Asia likely to have the largest prevalence. Intracapsular fractures account for nearly half of all hip fractures recorded. The treatment of this

fracture has generated debate, particularly when it comes to adult patients. The most widely used classification scheme for femoral neck fractures is the Garden classification of 1961, which is based on the degree of fracture migration. Based on anteroposterior radiographic images and degree of fracture displacement, Garden's classification system addresses the difficulties associated with internal fixation treatment, including recurrence, dispersed arteries, sequelae, and comorbidity risk. Garden's classification is subject to certain constraints, one of which is the low integrity of the viewer.¹

Because internal fixation, or IF, is less likely to fail in younger patients than in older ones, who run the risk of long-term implantation risks and the need for repeat surgery, IF is still a dependable and widely accepted treatment modality for managing displaced femoral neck fractures in patients under the age of 65. Moore and Bohlman performed the first hemiarthroplasty in 1943, and their prostheses are still routinely used today to treat femur neck fractures in many different parts of the world. In contrast to internal fixation, the prior studies' encouraging findings indicated a first step. But a number of related issues continued to exist. Femoral stem loosening, prosthetic head protrusion into the pelvis, and acetabular erosion were the primary complications.²

Christiansen pioneered bipolar hemiarthroplasty in the late 1960s. This technique allowed for minimal movement between the prosthetic head and stem thanks to an integrated trunnion bearing. Although the clinical results were improved, acetabular erosion remained a related consequence. Then, in 1974, Bateman introduced the bipolar prosthesis, which had a head element that could move and an extra head surface to accommodate acetabulum movements. Compared to a unipolar endoprosthesis, a bipolar prosthesis had numerous benefits such as a quicker return to independent activities, a higher proportion of good results, a lower incidence of acetabular erosion, less stem loosening with cement use, less postoperative pain, and a wider range of movement. Total hip arthroplasty is not a commonly used treatment for these fractures since hemiarthroplasty yields better and more acceptable results and is less expensive.³

Since Charnley began using PMMA (polymethylmethacrylate) in 1970, cement use has become more common. During total hip arthroplasties, the PMMA that had previously been utilized to fix dentures was used to anchor the femoral head prosthesis in the femur. Therefore, in older patients, cemented bipolar hemiarthroplasty is a promising treatment option for controlling femur neck fracture. The evidence in the literature is sparse, and one research indicated higher mortality following cemented bipolar hemiarthroplasty.⁴ Therefore, the goal of this study was to assess functional results after cemented bipolar hemiarthroplasty for the treatment of an intracapsular femur neck fracture.

MATERIALS AND METHODS

The goal of the current prospective clinical trial was to assess functional results after cemented bipolar hemiarthroplasty for the treatment of an intracapsular femur neck fracture. The subjects who visited the Institute's Department of Orthopedics made up the study population.

28 participants, of both sexes, with intracapsular femur neck fractures treated at the Institute's Department of Orthopedics were included in the study. participants with a verified diagnosis of a displaced intracapsular femur neck fracture, participants 50 years of age or older, and subjects willing to engage in the study were the inclusion criteria for the research.

Subjects with open fractures, patients for whom surgery or general anesthesia was contraindicated, and those younger than fifty years of age were the study's exclusion criteria. Following final inclusion, each participant had a thorough history taken, and then a clinical assessment. Following confirmation of the intracapsular femur neck fracture diagnosis, cemented bipolar hemiarthroplasty was used to treat the patients surgically. All of the patients had regular investigations and pre-anesthetic evaluations done before surgery. Following the anesthesia clearance, all individuals underwent elective surgery, which was followed by a critical evaluation lasting ten to twelve days. Following the removal of the sutures, the individuals were released, and at subsequent recalls, they underwent routine radiological and clinical evaluations.

Following surgery, check-ups were conducted four, six, and six months after discharge. Based on the functional outcomes of the surgery, the results were rated as outstanding, good, fair, and bad based on the Harris Hip Score⁵. Using SPSS software version 21 (Chicago, IL, USA) for statistical assessment and one-way ANOVA and t-test for result formulation, the gathered data were examined. The data were presented as a mean, standard deviation, percentage, and number. At $p < 0.05$, the significance threshold was maintained.

RESULTS

The goal of the current prospective clinical trial was to assess functional results after cemented bipolar hemiarthroplasty for the treatment of an intracapsular femur neck fracture. There were 28 participants in the research, all female, with intracapsular femur neck fractures. Table 1 contains a list of the study individuals' demographic details. The study included 39.28% (n=11) female participants and 60.71% (n=17) male participants. Most of the research participants were between the ages of 61 and 70, including 39.28% (n = 11) of the sample, 32.14% (n = 9) of the sample in the >70 age range, and at least 28.57% (n = 8) of the sample in the 51-60 age range.

For 50% (n=14) of the subjects, the length of their hospital visit was 11–15 years; 28.57% (n=8) of the subjects had a stay of 6–10 days, and 21.42% (n=6) of the study subjects had a stay of 3-5 days. Of the study patients, 42.85% (n = 12) involved the left side and 57.14% (n = 16) involved the right side (Table 1).

When the Harris Hip scores of the study subjects were graded, as indicated in Table 2, it was found that 10.71% (n=3) of the subjects had poor scores, 25% (n=7) had fair scores, 50% (n=14) had good scores, and 14.28% (n=4) had excellent scores.

Regarding the radiological characteristics of the research subjects, it was observed that 50% (n=14), 39.28% (n=11), and 10.71% (n=3) of the study subjects had radiological gradings of excellent, good, and poor, respectively. 17.85% (n=5) of the study patients had ectopic eruption, whereas 88.14% (n=23) did not. Of the study subjects, 46.42% (n = 13) had a neck shaft angle >140°, whereas 53.57% (n = 15) had a neck shaft angle between 110°-140°. According to Table 3, femoral anteversion was >20° in 32.14% (n=9) research participants, <100 in 21.42% (n=6) study subjects, and 15±50 in 46.42% (n=13) study subjects.

DISCUSSION

The goal of the current prospective clinical trial was to assess functional results after cemented bipolar hemiarthroplasty for the treatment of an intracapsular femur neck fracture. Twenty-eight male and female participants with intracapsular femur neck fractures were included in the study. The study included 39.28% (n=11) female participants and 60.71% (n=17) male participants. Most of the research participants were between the ages of 61 and 70, including 39.28% (n = 11) of the sample, 32.14% (n = 9) of the sample in the >70 age range, and 28.57% (n = 8) of the sample in the 51-60 age range. For 50% (n=14) of the subjects, the length of their hospital visit was 11–15 years; 28.57% (n=8) of the subjects had a stay of 6–10 days, and 21.42% (n=6) of the study subjects had a stay of 3-5 days. Of the study individuals, 42.85% (n = 12) included the left side and 57.14% (n = 16) involved the right side. These characteristics were similar to those of the investigations conducted by Bhandari M et al. (2006) and Damany DS et al. (2005), in which the authors evaluated participants with similar characteristics to those of the current investigation.

Regarding the grading of the Harris Hip scores for the research subjects, it was observed that 10.71% (n=3) of the subjects had poor scores, 25% (n=7) had fair scores, 50% (n=14) had good scores, and 14.28% (n=4) had excellent scores. These results were consistent with the results of Moore AT⁸ in 2006 and Yurdakul E et al⁹ in 2015 where authors reported similar Harris Hip scores as of the present study in their study subjects.

Regarding radiological parameters, it was observed that 50% (n=14), 39.28% (n=11), and 10.71% (n=3) of the study individuals had radiological gradings of excellent, good, and bad, respectively. Ectopic eruption was observed in 17.85% (n=5) of the study participants and did not occur in 88.14% (n=23) of the study participants.

Of the study subjects, 46.42% (n = 13) had a neck shaft angle >140°, whereas 53.57% (n = 15) had a neck shaft angle between 110°-140°. Femoral anteversion was found to be 15±50 in 46.42% (n=13) of the study participants, <100 in 21.42% (n=6), and >20° in 32.14% (n=9) of the study participants. These results were consistent with the radiography data that the authors of YS Prashanth et al. (2017) and Peeters CM et al (2016) published in their research, which were similar to the current study.

CONCLUSION

Within its limitations, the present study concludes that one of the best ways for managing intracapsular femur neck fracture is cemented bipolar arthroplasty which shows good clinical outcomes in elderly subjects. To assess the complications continuous radiological and clinical testing is vital. The present study had a few limitations including a small sample size, shorter monitoring period, and geographical area biases. Hence, more longitudinal studies with a larger sample size and longer monitoring period will help reach a definitive conclusion.

REFERENCES

1. Babhulkar S. Unstable trochanteric fractures: issues and avoiding pitfalls. *Injury*. 2017;48:803–18.

2. Zhang H., Zeng X., Zhang N., Zeng D., Xu P., Zhang L. INTERTAN nail versus proximal femoral nail anti-rotation-Asia for intertrochanteric femur fractures in elderly patients with primary osteoporosis. *J Int Med Res.* 2017;45:1297–309.
3. Wamper K.E., Sierevelt I.N., Poolman R.W., Bhandari M., Haverkamp D. The Harris hip score: do ceiling effects limit its usefulness in orthopedics? *Acta Orthop.* 2010;81(6):703–7.
4. Li Z., Liu Y., Liang Y., Zhao C., Zhang Y. Short versus long intramedullary nails for the treatment of intertrochanteric hip fractures in patients older than 65 years. *Int J Clin Exp Med.* 2015;8:6299–302.
5. Harris W.H. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. *J Bone Joint Surg Am.* 1969;51:737–55.
6. Bhandari M, Devereaux PJ, Tornetta P et al. Operative management of displaced femoral neck fractures in elderly patients. An international survey. *J Bone Joint Surg Am.* 2005; 87:2122-30.
7. Damany DS, Parker MJ, Chojnowski A. Complications after intracapsular hip fractures in young adults.A meta-analysis of 18 published studies involving 564 fractures. *Injury.* 2005;36:131-41.
8. Moore AT, Bohlman HR. Metal hip joint: a case report. 1942. *Clin Orthop Relat Res.* 2006;453:22-24.
9. Yurdakul E, Karaaslan F, Korkmaz M, Duygulu F, Baktır A. Is cemented bipolar hemiarthroplasty a safe treatment for femoral neck fracture in elderly patients? *Clin Interv Aging.* 2015;10:1063–67.
10. YS Prashanth, M Niranjana. Comparative Study of Surgical Management of Fracture Neck of Femur with Cemented Versus Uncemented Bipolar Hemiarthroplasty. *Journal of Clinical and Diagnostic Research.* 2017;1:17-21.
11. Peeters C.M., Visser E., Van de Ree C.L., Gosens T., Den Ouden B.L., De Vries J. Quality of life after hip fracture in the elderly: a systematic literature review. *Injury.* 2016;47:1369–82.

TABLES

Characteristics	Percentage (%)	Number (n=28)
Gender		
Males	60.71	17
Females	39.28	11
Age range (years)		
51-60	28.57	8
61-70	39.28	11
>70	32.14	9
Hospital stay duration		
3-5	21.42	6
6-10	28.57	8
11-15	50	14
Side involved		
Left	42.85	12
Right	57.14	16

Table 1: Demographic characteristics of the study subjects

Grading	Percentage (%)	Number (n)
Poor	10.71	3
Fair	25	7
Good	50	14
Excellent	14.28	4
Total	100	28

Table 2: Harris Hip scores grading in the study subjects

Parameter		Percentage (%)	Number (n)
Radiological Grading	Excellent	50	14
	Good	39.28	11
	Poor	10.71	3
Ectopic orientation	Present	17.85	5
	Absent	82.14	23
Neck shaft angle	>140°	46.42	13
	110°-140°	53.57	15
Femoral anteversion	15±5°	46.42	13
	<10°	21.42	6
	>20°	32.14	9

Table 3: Radiological parameters in the study subjects