

Comparison of total hip arthroplasty and hemiarthroplasty in elderly patients with femoral neck fracture.

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Abstract

Objective: To compare total hip arthroplasty and hemiarthroplasty in elderly patients with femoral neck fracture.

Methods: 100 cases of elderly patients with femoral neck fractures enrolled in our hospital from October 17, 2015 to March 17, 2017 were selected and divided into 2 groups (Group A and Group B) randomly with 50 patients in each group. Patients in Group A were treated with total hip arthroplasty while those in Group B received hemiarthroplasty. The intraoperative conditions (time and amount of bleeding) and postoperative status (out-of-bed activity and complications) of patients in each group were compared and the treatment effect was analyzed.

Results: In Group A, the operation time lasted 89.26 ± 10.05 min, the amount of intraoperative bleeding was 402.61 ± 31.16 ml and the patients began to get out of bed in 7.15 ± 1.29 d. In Group B, the operation time was 68.49 ± 9.76 min, 218.26 ± 28.43 ml intraoperative bleeding and 5.31 ± 1.47 d was taken to get up from the bed. The differences of those indexes between two groups were significant ($P < 0.05$). However, there was no significant difference in the complications and treatment effects ($P > 0.05$).

Conclusion: Hemiarthroplasty and total hip arthroplasty have different effect on the treatment of elderly patients with femoral neck fractures, thus making it necessary to determine the surgical plan according to the patient's situation.

Keywords: Hemiarthroplasty, Total hip arthroplasty, Senior femoral neck fractures.

Accepted on July 20, 2017

Introduction

The femoral neck is a flattened pyramidal process of bone, connecting the femoral head with the femoral shaft, and forming with the latter a wide angle opening medial ward. The femoral neck is the weakest part of the femur. Femoral neck fractures are a subset of proximal femoral fractures. Since disruption of blood supply to the femoral head is dependent on the type of fracture and causes significant morbidity, diagnosis and classification of these fractures is important. Femoral neck fractures can be classified with 3 categories: tension, compression, and displaced. In clinical, adequate preparation should be made before treating femoral neck fractures with artificial hip replacement, especially for the treatment of the elderly patients [1,2]. In this paper, research on the elderly patients with femoral neck fractures admitted to hospital from 2015 to 2017 was conducted to seek appropriate treatment plan (hemiarthroplasty or total hip arthroplasty) as shown below.

Materials and Methods

Materials

From October 17, 2015 to March 17, 2017, 100 patients with femoral neck fractures were collected in North Heavy Industry Group Limited Liability Company Hospital. The patients were divided into 2 groups (Group A and Group B) with 50 cases in each group. In group A, there were 28 males and 22 females ranging from 62 to 76 y old and the average age was 69.49 ± 3.32 y old. In group B, there were 27 males and 23 females ranging from 63 to 75 y old, they were 69.73 ± 3.51 y old on average. There was little difference in various basic data of the 2 groups ($P > 0.05$) and comparative study thus can be performed.

Methods

The hemiarthroplasty measure for elderly patients with femoral neck fracture of group B was shown as follows:

The patients were treated with anesthesia and were guided to take posterior recumbent position after the onset [3-5]. The incision around 10.00 cm was taken from the outside of the affected area, the femoral neck on small trochanter of the patient was cut off and then the bone was taken out for measurement. With the cleaning work done, the model was set and put into the test with adjustment of relevant position. Related modulation work as well as formal installation was conducted in the end of the test and conditions including the joint elasticity were checked followed by the reduction of the patient's hip joint [6-9]. The incision was closed after the completion of drainage device and the patients were told to pay attention to some noticeable things after the operation (wearing T-shaped shoes and taking functional exercises 2 d-1 week after the operation).

The total hip arthroplasty measure for elderly patients with femoral neck fracture of group A was shown as follows [10,11].

The first step was same with that of the group B. The method was the same except for incision size 12.00 cm. The acetabular and femoral prosthesis suitable for the patient were selected to perform the implantation with other treatment ways, same as above.

Observation indexes

The intraoperative conditions mainly including required time of the operation and amount of bleeding were observed and postoperative status in 2 groups were recorded, mainly including out-of-bed activity and complications after the operation. Meanwhile, therapeutic effects of the 2 groups were evaluated by means of Harris hip score.

Treatment effect and Harris hip score value

The therapeutic effects of elderly patients with femoral neck fractures in 2 groups were evaluated as following levels by means of Harris hip score [12]: Excellent: Score above 90; Good: Score of 80-89; Medium: Score of 70-79; Poor: Score less than 70. The rate of excellent and good level of one single group=rate of total levels, (100.00%=50), the difference between the rate of medium level and the rate of poor level.

Statistical analysis

The data of intraoperative conditions (required time of the operation and amount of bleeding) and postoperative status (the average time of out-of-bed activity) were expressed by

Mean \pm SD with t-test carried out and the data of on postoperative complications rate and the effective rate under the Harris hip score is expressed by “%” with chi square test carried out on SPSS 20.0 software for statistical analysis. $p < 0.05$ suggested that the difference had statistical significance.

Results

The comparison of operation indexes in 2 groups

Operation time of the group A was 89.26 ± 10.05 min, longer than that of the group B, 68.49 ± 9.76 min, and the bleeding amount of group A was larger than that of the group B of statistical significance, $P < 0.05$ (Table 1).

Table 1. The comparison of operation indexes in 2 groups.

Group	Case	Operation time (min)	Bleeding amount (mL)
Group A	50	89.26 ± 10.05	402.61 ± 31.16
Group B	50	68.49 ± 9.76	218.26 ± 28.43
t		1.576	1.852
P		0.031	0.022

The comparison of postoperative indexes in 2 groups

The patients of the group A began to get out of bed at 7.15 ± 1.29 d, later than the patients of the group B of statistical significance, $P < 0.05$, but there was no significance difference in complications in 2 groups, $P > 0.05$ (Table 2).

Table 2. The comparison of postoperative indexes in 2 groups.

Group	Case	Out-of-bed time (days after operation)	Complications (n, %)
Group A	50	7.15 ± 1.29	3 (6.00)
Group B	50	5.31 ± 1.47	2 (4.00)
t		1.179	0.834
P		0.039	0.721

The comparison of treatment result in 2 groups

The excellent and good rate of the group A (98%) was better than that of the group B (92%) yet with no significant difference between the 2 groups, $P > 0.05$ (Table 3).

Table 3. The comparison of treatment results in 2 groups.

Group	Case	Excellent	Good	Medium	Poor	Excellent and good rate
Group A	50	29	20	1	0	49 (98.00%)
Group B	50	26	20	3	1	46 (92.00%)
t		0.816	1.791	0.852	0.925	0.973
P		0.622	0.933	0.774	0.833	0.552

Discussion

Femoral neck fractures occurred mainly in the elders, beyond sixty years, give rise to symptoms such as severe tenderness around inguinal ligament, pain in hip and even bending the knee and the hip or externally rotational deformity [13-16]. This study, in the purpose of taking corresponding measures for the treatment of senile femoral neck fracture, selects 2 groups of patients with this disease who were treated respectively by cemented hemiarthroplasty and total hip arthroplasty to expect a better treatment regimen, provide the basis for clinical treatment and lower the risk of senile femoral neck fracture.

Artificial hip replacement mainly includes hemiarthroplasty and total hip arthroplasty, and for elderly patients with femoral neck fracture, however, there are several disputed problems in the choice of either the former or the latter for clinical treatment [17,18]. Relevant data shows that the total hip arthroplasty has better effect in the treatment but with long operation time and postoperative recovery time of about a week on an average. By contrast, the hemiarthroplasty has the advantages of less operation time, fast prognosis but with its effect slightly inferior to the former. Therefore, the choice of adopting treatment plan in clinical practices should be made by combing the conditions of the patients with the advantages of the treatment measures [19,20].

The test data shows that in group A (in the treatment of total hip arthroplasty), the operation time lasted 89.26 ± 10.05 min, the amount of intraoperative bleeding was 402.61 ± 31.16 ml and the patients began to get out of bed at 7.15 ± 1.29 d while in group B (in the treatment of hemiarthroplasty), the data were respectively as 68.49 ± 9.76 min, 218.26 ± 28.43 ml and 5.31 ± 1.47 d, better than results of group A of statistical significance, $P < 0.05$. However, there was no significant difference in the complications and treatment effects in the 2 groups (98% in group A, 92% in group B), $P > 0.05$.

To sum up, when compared with total hip arthroplasty, hemiarthroplasty has the advantages of short operation time, less bleeding and quick recovery in the treatment of elderly patients with femoral neck fracture. However, its treatment effect turns out to be slightly inferior to that of total hip arthroplasty, thus making it required to choose appropriate surgical treatment scheme according to specific situation of elderly patients.

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