Functional Evaluation of Partial Hip Arthroplasty in Patients with Hip Fractures

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ABSTRACT

The goal of this study was to evaluate the functional results of partial hip arthroplasty in hip fractures. The mortality, morbidity, and functional statuses were investigated.

Patients operated with partial hip arthroplasty for the hip fractures between January 3, 2001, and January 30, 2010, were evaluated retrospectively. The Oxford hip score was carried out, and the results were analyzed.

A total of 82 of 130 patients who were operated with partial hip arthroplasty for hip fractures reached Fatih University Hospital (new name of Turgut Özal University). The mean follow-up time was 37.76 months and the mean age of the 82 patients was 78.99. Of the total number of patients, 25 were men and 57 were women. A total of 49 patients were alive and 33 were dead. The mean postoperative survival of these patients was 31.1 months. The mean total score of the Oxford hip score was 50.17. There was no effect of operation age, sex, hypertension, diabetes mellitus, renal diseases, dementia, and chronic obstructive lung disease on the Oxford hip score. Survival was not affected by the result of the Oxford hip score. The total Oxford hip score was less in patients who had heart disease, but it was not significant statistically. Embolus affected the hip score negatively.

Partial hip arthroplasty takes a big place in the treatment of hip fractures, and it is a successful treatment choice in functional evaluation. New investigations are needed to compare the functional results of partial hip arthroplasty with other treatments.

Key words: Partial hip arthroplasty, Oxford hip score

INTRODUCTION

The rate of hip fracture increases with age, doubling every 5–6 years after the age of 60 years. Approximately, 90% of hip fractures occur after the age of 65 years (1). As the average life span has increased, the number of people aged over 65 years with osteoporosis has also increased (2). Traffic accidents and industrial injuries have increased the incidence of hip fractures. Hip fractures as a percentage of fall injuries are more common in females, and this percentage alsoincreases with age (3%–30% for females compared with 2%–10% for males) (3).

In elderly patients, the rate of complications such as nonunion after fixation and implant failure is high. Such patients require a reoperation for their treatment. Other devises developed as an alternative to operation are as follows: intramedullary nailing fixation, 3 AO cannulated screws, a fixed angle of hip plates, sliding compression screw. "Minimal Invasive Sliding Antirotatory Compressive Hip Screw (MIS A CHS)" was used for the first time in Turkey (Figure 1) (4).

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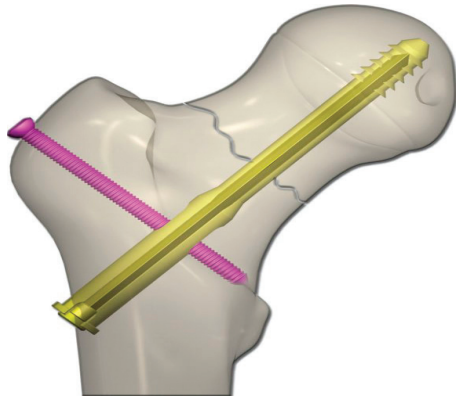

Figure 1: Shematized MIS A CHS antirotatory compression hip screw has been developed by Prof Fuat Akpınar (3).

Patients who undergo arthroplasty are able to take their first steps on the second day of surgery with the help of a cane or walker, and they may return to their prefracture functional status as early as possible (5). Young and active patients should try to protect the femoral head; yet, early mobilization is important especially for elderly patients. In active older patients, the results of one of the studies show a clear advantage of arthroplasty over fixation. Arthroplasty was more clinically effective and probably less costly over a 2-year period postsurgery (6).

Today, conservative methods are not recommended in the treatment of perthrochanteric femoral fractures. Hornby and colleagues compared the conservative and surgical treatment and showed that the possible secondary complications decreased in patients with early mobilization (7). Conservative treatment methods can be chosen for patients who have high-risk for operation or who are not suitable for ambulation. Bisphosphonates and hip protectors probably decrease the risk of suffering a hip fracture by 50% (8).

This study aimed to evaluate patients operated for partial hip replacement due to hip fracture, and to compare the findings of this study with those of the available literature.

PATIENTS AND METHODS

Patients who underwent hemiarthroplasty for proximal femoral fractures in Turgut Özal University (old name is Fatih University) Hospital between January 3, 2001, and January 30, 2010, were retrospectively analyzed (Figures 2 and 3). Information processing system and archive were used in the hospital.

Patients were controlled for the general health status, and the Oxford hip score was applied to them (9). In addition to this, the patients' gender, age at the time of surgery, operative side—whether they are alive or dead, date of death if not alive, and concomitant diseases were recorded. The scores of deceased patients after surgery were discussed and determined with their relatives. Results were analyzed using SPSS 16 software. This analysis evaluated the effect of all parameters on the hip scoring. In our case series that was studied retrospectively with the help of SPSS 16 program, the effects of data on each other were evaluated by using Kaplan–Meier survival analysis, Log Rank test, Mann–Whitney U test, Pearson test, and Spearman test.

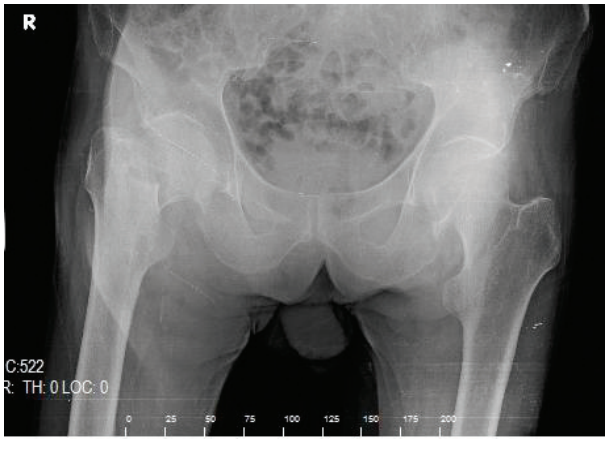

Figure 2: Preoperative pelvic antero-posterior X-ray view of an 82-year-old patient who was diagnosed with right femoral neck fracture.

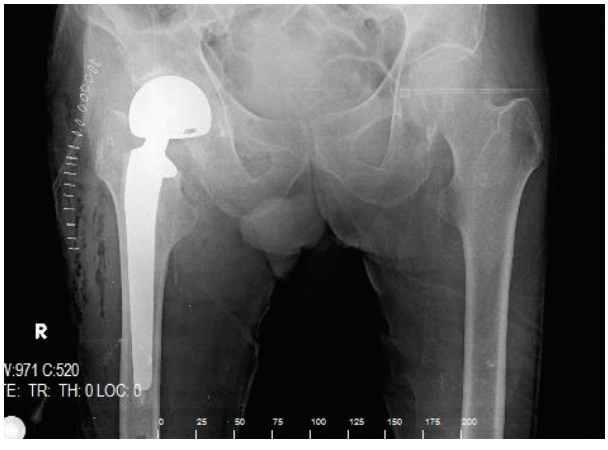

Figure 3: Postoperative pelvic anteroposterior X-ray view of an 82-year-old patient who was diagnosed with right femoral neck fracture.

Table 1: Descriptive statistics of the cases.

	N	Min.	Max.	Mean	SD
Age of operation	82	55	98	78,99	7,974
Life time	82	0	85	31,10	23,771
Total score (Oxford hip score	82	19	60	50,17	10,133

SD: Standard Deviation

RESULTS

Of the 130 patients who underwent surgery of partial endoprosthesis of hip fracture, 82 reached Fatih University Hospital between March 1, 2001, and March 1, 2010. The patients' descriptive statistics are presented in Table 1; the patients' average follow-up time was 37.76 months (minimum, 12 months; maximum, 85 months).

The average operation age of the 82 patients was 78.99 (minimum: 55, maximum: 98). Of 82 patients, 25 were male and 57 were female, and 49 patients were alive and 33 patients were dead. The femoral neck fracture occurred in 48 patients on the right side, in 28 patients on the left side, and in 6 patients on both sides.

The patients with comorbidities were as follows: 35 patients with hypertension, 27 patients with heart disease, 13 patients with diabetes, 7 patients with kidney disease, and 3 patients with perioperative embolism.

The patients' postoperative survival span was of 31.1 months (minimum, 0 months; maximum, 85 months). The negative effect of age at surgery on the duration of life was found statistically significant (p: 0.05). For surgery patients over the age of 79 years, the average life expectancy was shorter.

Hypertension, diabetes, kidney disease, dementia, and Chronic Obstructive Pulmonary Disease (COPD) had no effect on the duration of life. Heart disease was found to be effective on the duration of life. Life expectancy was shorter in patients with heart disease ($p = 0.041$). Embolism had a direct effect on the duration of life. Three of the three patients with embolism died postoperative. ($P = 0$). The total score on the Oxford hip score was not found effective at all in life expectancy ($p = 0.215$).

Surgery age, gender, hypertension, diabetes, dementia, kidney disease, and COPD did not have any effect on the Oxford hip scale results. The hip scale total score was lower in patients with heart diseases. Yet, this finding was not statistically significant (p: 0.090). The effect of emboli on Oxford hip scale results was negative (p: 0.02).

DISCUSSION

This study was aimed at observing the results of partial hip replacement that is the most applied method of treatment for femoral neck fractures in elderly patients. In a 9-year period, patients consulting to the hospital were reviewed retrospectively.

D'Angelo and colleagues analyzed mortality and risk factors of patients undergoing partial hip replacement due to femoral neck fractures in a series of 299 cases (10). In their study, whose average follow-up period was 5 years, 10 parameters that were thought to affect mortality were examined. These parameters were age, sex, waiting time for surgery, pulmonary insufficiency, fracture etiology, ischemic heart disease, heart attack, hypertension, cerebrovascular disease, and chronic renal failure. The cumulative mortality rate in the first 6 months was 19% (55 of 299 patients); the mortality rate in the first year was 25% (76 patients of 299). According to the logistic regression analysis, age, male gender, surgery, waiting period, and the presence of neoplastic disease were associated with pathologic fracture. Similar to other publications in the literature, femoral neck fractures in this study were associated with mortality in the first year. The result of this study pertaining to the effect of age at the time of surgery on the life span was similar to that of the findings of this study; however, the observation that the heart disease shortens the life span did not match with this study.

Şener and colleagues examined the effectiveness of treatment in elderly patients with hip fracture due to partial dentures and intercourse between mortality and morbidity (11). They observed that with the increase in comorbidity and duration between fracture occurrence and surgery, deterioration of the walking ability after operation, and the advancement of age, the mortality increases significantly. They think that comorbid factors going with the planning of treatment and rehabilitation of elderly patients applied partial denture due to hip fracture, walking capacity and surgery time should be taken into consideration. There is no contradiction between the data and the results obtained from this study.

Sharma and colleagues published a series of 92 diseases in 1982, which used Girdlestone arthroplasty as a mode of treatment. The Girdlestone arthroplasty, as popularly known, is a type of arthroplasty applied for removing the broken femoral neck (12). This technique has been applied in many cases and has given excellent results, especially if there is infection. It provides a mobile painless hip joint, and no handicap is seen except brevity and unstable walking. The advantages of using this technique are more compared to complications caused due to other sophisticated surgical methods. It is reported that the results of 21% is excellent, 44% is good, 26% is moderate, and 9% is bad. Keeping in mind the functional results, Girdlestone surgery is presented as a good alternative to other surgeries.

The study by Sharma and colleagues provided an important and easy alternative for orthopedic surgeons. Girdlestone technique is an important and easy alternative for the following cases: where facilities are limited, where surgery cases are of short duration, where infections arise during surgery, and where other unexpected problems that may arise during the surgery. As this study was performed in the 1980s in India, this technique may be considered as the last choice today.

Muller and colleagues treated 210 femoral neck fractures with bipolar hemiarthroplasty in 203 series of diseases (13). Patients were retrospectively examined; the average age of the mid-value of 149 female and 54 male patients was 82 (46–97). During surgery, 144 patients (71%) had more than three medical conditions. Even with 27.9-month follow-up visits, 97 (48%) patients died.

On examination it was found that out of 76 patients Harris hip scoring of 17% patients was 90–100, of 20% patients was 80–89 or 70–79, and of 43% patients it was below 70.

The work by Müller and colleagues is methodologically a strong study. Patients were examined both clinically and radiologically, and the observations were documented. Of 203 patients, only 75 could be examined and the radiography samples of only 35 patients could be analyzed. No contradiction was observed between our data and the results and the results of this study.

This study was examined and compared with hundreds of scientific studies in the literature on this subject, and no serious contradictions were observed. In today's medical technology, partial hip arthroplasty is a predominant technique in the treatment of femoral neck fractures. Early movement appears to be the biggest advantage. This study was the first to make functional assessment of partial dentures after hip fracture in the Oxford hip score.

With an average of 83.6 out of 100 fractures, it has been found that the functional assessment of partial dentures after hip fractures is quite successful with this technique. To compare the functional results of the application, other treatment options for partial dentures are needed.

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