Short-term (2 years) results of primary total hip replacement in 40 mobile elderly patients with fractured neck of femur

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Background
The option of primary total hip replacement in patients with fractured neck of femur gives satisfactory functional results, which evokes the idea of this research to study the outcome of total hip replacement (THR) in patients older than 60 years having fractured neck of femur.
Patients and methods
A total of 40 active patients older than 60 years were included in our series. Patients were operated after a mean of 5 weeks after fracture. All patients were operated on by THR, under regional anesthesia, using modified Hardinge approach in lateral position. Postoperatively, all patients were allowed to bear weight as tolerated on the second day after operation. All patients were followed up at 6 weeks, 3 months, 6 months, and every 6 months thereafter.
Results
The results were good in all patients at 3 months, excellent in 23 patients at 6 months, and excellent among all at 2-year follow-up, with mean harris hip score (HHS) of 94.
Conclusion
Primary THR is a good line of treatment in active patients older than 60 years with fractured neck of femur.

Keywords:
fractured neck of femur, Harris hip score, total hip

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Introduction

Femoral neck fractures are frequent injuries in the patient population presenting to every trauma center and have a high incidence in the general population. An estimated 1.6 million people sustain a hip fracture every year. Each year, hip fractures are responsible for the loss of at least 2.35 million disability-adjusted life years, and more than five million people in the world experience disability from a hip fracture [1–3].

A hip fracture is a life-changing event for any patient, and the risk of disability, increased dependence, and death is substantial. Approximately half of the hip fractures are intracapsular femoral neck fractures. Paralleling trends of demographic forecasts, their incidence will continue to rise in the future. Especially in the elderly, femoral neck fractures represent a significant healthcare problem and have enormous effect on health insurance costs [1–3].

Therefore, the appropriate treatment of femoral neck fractures is mandatory. Today, surgery is the mainstay of care. The treatment of older patients with intracapsular femoral neck fractures largely depends on local conditions, patient profiles, personal preferences, and training of the surgeon. This is merely based on personal beliefs determining the management of patients than evidence from the literature [1–3].

For active, elderly people (older than 60 years), total hip replacement (THR) seems to be a reliable option when compared with hemiarthroplasty, according to many recent studies. THR provided better functional results than bipolar hemiarthroplasty 1 year post-operatively, without increasing the complication rate. THR has long-term advantages over bipolar hemiarthroplasty, and despite the initial higher cost of THR, when total hip-related costs were compared, THR had a cost advantage over both internal fixation and hemiarthroplasty [1–3].

Patients and methods

During the period from January 2010 to August 2010, 40 patients with fractured neck of femur aged 60–70 years admitted to the Casuality Department in Cairo University Hospitals were treated by primary THR.

A total of 40 patients aged 60–70 years were followed up for 12 to 32 months, and a mean of 19 months. Their mean age was 64.6 years. There were 28 male and 12 female patients. Patients with pathological fractures and cases with terminal chronic diseases were excluded from the study.

All patients were admitted in the ordinary ward, and history was taken to assure functional activity before fracture occurrence. Patients were medicated by low-molecular-weight heparin (stopped 12 h before the operation) and analgesics in form of NSAID. No traction was applied, Physiotherapy have certain training for chest ventilation and for culf muscle training to avoid DVT (deep venous thrombosis). Investigations in the form of complete blood count (CBC), PT-PC-INR, liver and kidney function, and blood sugar were done. Radiographs in AP and lateral views of both hips in the magnification of 115% were done to allow preoperative templating and classification of fractures according to Garden: six patients type II, 20 type III, and 14 type IV. Four patients had associated DM, 12 had HTN, and seven had IHD.

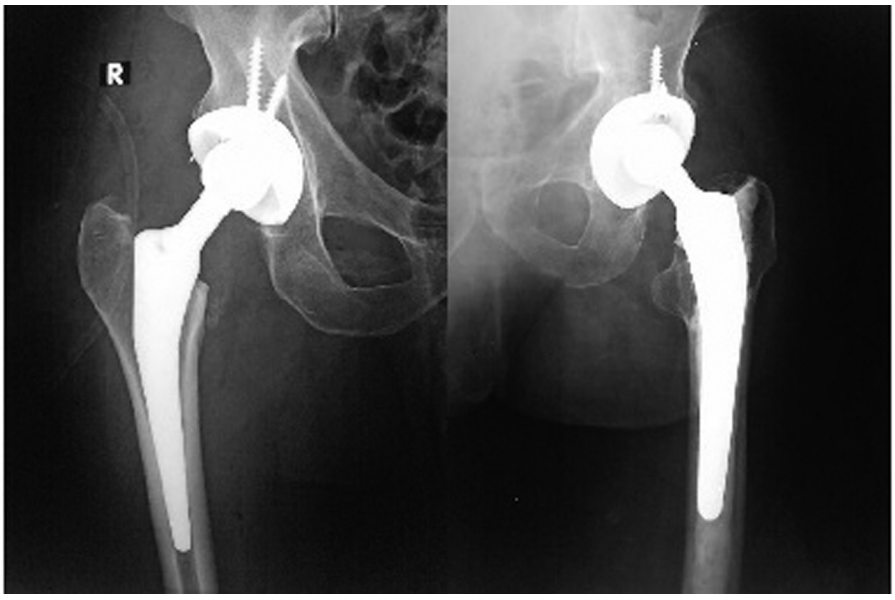
All patients received third-generation cephalosporin (cefotaxime) before the induction of anesthesia, and all patients received regional anesthesia in the form of spinal or epidural anesthesia. All patients were operated on in lateral position using modified lateral approach. The implant used was either cemented THR colarless poloished tapered (CPT) from Zimmer (Zimmer Biomet, Warsow, USA) or cementless and hybrid THR from Biotechni (Rowan, France). The choice of implant was tailored according to the case. The choice of acetabular component was according to bone quality in preoperative radiographs and intraoperative bone strength, which holds the cup. Femoral component choice was according to Dorr's ratio or the canal-to-calcar ratio, which is the ratio between the diameter of the canal 7 cm below the lesser trochanter and diameter of the canal at level of lesser trochanter; cases with ratio of 0.7 and less were indicated for cementless stems, and cases with ratio more than 0.7 were indicated for cemented stems. Figure 1 shows the implant used.

Postoperatively, patients received 3 days of parenteral antibiotics cefotaxime; blood transfusion was needed in only four patients in whom blood loss was 500 ml or more. All patients were instructed to start ROM in which excessive external rotation, adduction, and flexion beyond 90° was avoided. All patients were instructed to bear weight as tolerated [either partial or full weight bearing (WB)] from second day with a walker for 2 weeks and then one crutch in the opposite hand for 4 weeks.

Radiographs were done on the second postoperative day pelvis AP and hip with femur AP and lateral views were to assess the prosthesis implantation. The wound is dressed and drain removed on the third day. Patients were discharged on the sixth postoperative day after instructions about movement of the hip and weight bearing were given.

Patients were informed about the follow-up schedule which was at 6 weeks, 12 weeks, 6 months, and every 6 months thereafter. During visits, radiographs were

Figure 1



Implants used and implant positioning.

done, and the patient was examined for wound condition and hip function. Harris hip score was assessed, and according to the scoring system, patients were classified as excellent, good, fair, and poor. Radiographs were interpreted to detect any complications, for example, loosening and subsidence.

Results

Functional evaluation of the patients was done by a standardized protocol, which was the examination of patient's wound condition and hip function. Evaluation by Harris hip score. Patients were examined at 6 weeks, 3 months, 6 months, and every 6 months thereafter.

Wound condition

During period of follow-up, there were no cases of wound infection, either deep or superficial.

Functional scoring (HHS)

Scoring of the 40 patients was done at 6 weeks, 3 months, 6 months, and every 6 months thereafter. At 6 weeks, the mean harris hip score (HHS) was 84, which is good. At 6 months, the mean HHS of the 40 patients was 90.5, owing to showing improvement in limping and distance walked being unlimited. AT one and 2 years all patients was subjected to functional score according to harris hip scoring.

Radiological outcome

The radiographic evaluation was done according to standardized protocol of radiograph of pelvis AP view and hip radiographs (AP and lateral views). The evaluation was done to assess positioning of the acetabular and femoral components, any change in position, and any signs of loosening (for example, radiolucent lines at bone cement or cement prosthesis interface, radiolucent cavities, and breakage of cement mantle), with no abnormality detected in all patients.

Complications

Patients were monitored for postoperative complications such as infections, dislocation, hematoma formation, intraoperative femoral fractures, chest infections, urinary tract infections, myocardial infarctions, thromboembolic diseases, and death.

There was one case of postoperative dislocation (2.5%), managed by closed reduction and delayed weight bearing; three cases of intraoperative fractures (7.5%), with two cases managed by circulage wiring and delayed weight bearing and one case with delayed weight bearing; and three cases of mortality after 1 year (7.5%). Figure 2 shows the functional and radiological outcomes.

Statistical analysis of the outcome

Student two-tailed *t*-test was used to detect the *P* value used in comparison of variables and detect different correlations of our study outcome, and significance is set below 0.05.

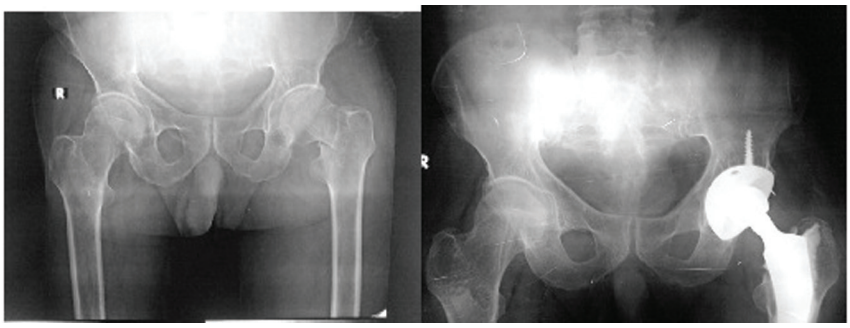
Regarding age in relation to HHS at 1 and 2 years, the *P* value was 0.84 and 0.83, respectively, which is insignificant. Regarding sex in relation to HHS at 1 and 2 years, the *P* value was 0.014 and 0.013, respectively, which is a significant relation and indicates that males have better functional outcomes than females.

Correlation between implant used, sex, and outcome

Regarding the relation between implant and sex was significant, with *P* value 0.037, and it indicates that the implant used was affected by sex, and cementless prosthesis was used more in men. Regarding the relation between implant used and HHS at 1 and 2 years, it was insignificant, with *P* value 0.51, which means no differences in outcome and the implant used.

The relation between associated comorbidities and preoperative delay and outcome shows no significance

Figure 2



Radiological outcome.

in relation between HHS at 2 years and both associated comorbidities and preoperative delay, with *P* values 0.9 and 0.93, respectively.

Discussion

Femur neck fracture the continues to be regarded as the 'unsolved fracture'. There is still no agreement on the optimal operative treatment of displaced subcapital fractures in the elderly. Controversy exists regarding rehabilitation, durability of internal fixation, and the type of prosthetic replacement [4,5].

The reported rates of complications, revision rates, and patient dissatisfaction after hemiarthroplasty arise the need of other methods of joint replacement. However, most published results give solid evidence that primary THR gives better functional results in patients with femur neck fractures [3,6–14].

In our series, 40 patients with fractured neck of femur, with mean age of 64.5 years, were followed up for a mean of 19 months after primary THR for femur neck fractures, which is a short-term follow-up. In the published series, some authors performed short- to medium-term follow-up such as Barnett *et al*. [6] who followed up 59 patients, with mean age of 72.1 years, for a mean of 13.5 months; Klein *et al*. [7] who followed up 85 patients, with mean age of 78.1 years, for a mean of 3.8 years; Squires and colleagues, who followed up 32 patients, with mean age of 82 years, for 3.7 years; Macaulay and colleagues, who followed up 41 patients, with mean age of 70 years, for 24 months; and Cho *et al*. [11] who followed up 80 patients, with mean age of 75.5 years, for 36 months. Other authors in many series reported 10 to 13 years follow-up such as Kasetti *et al*., who followed up 271 patients, with mean age of 70 years, for 13 years, Džupa *et al*. [13] who followed up 65 patients, with mean age of 68 years, for 10 years; and Goh *et al*. [14], who showed in a meta-analysis that 407 patients, with mean age of 65 years, were followed up for 13 years [3,6–14].

In comparison with our study, the published studies reported lower functional outcomes. This may be related to the mean age of the selected patients, as the studies reported the mean age ranging from 68 to 82 years, which may affect the patients' activity and ability to walk for long distances and the associated comorbidities, which may be associated with the patients' condition, even though studies that used short-term follow-up from mean of 13.5 months to 36 months reported lower functional results [3,6–14].

In our study, we observed that more cementless implants were used in male patients owing to the criteria used in implant selection, and they had better functional outcomes.

In our results, the reported rates of complications were nearly the same as the published rates [3,6–14].

Our study shows short-term results of primary THR in cases of fractured neck of femur in patients older than 60 years, which needs longer term follow-up and larger sample size, which we are working on. Absence of randomization is a point of weakness and further prospective randomized studies are needed for better level of evidence.

Conclusion

According to the results of our study and supported by the published studies, patients were found to have a good to excellent functional outcome. Therefore, primary total hip replacement is a valuable line of treatment in patients older than 60 years of age with fractured neck of femur [1–14].

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Nil.

Conflicts of interest

There are no conflicts of interest.

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