Original article

Survey the complications of femoral neck fracture

Masoud ShayestehAzar [1], Mohammad Hossein Kariminasab [1], Salman Ghaffari [2], Mehran Razavipour [2], Mehran Fazli [3*], Fataneh Mirjani[4], Shadi ShayestehAzar[5]

1. Associate professor of orthopedic surgery, Orthopedic Research center, Mazandaran university of medical science, Sari, Iran.

2. Assistant professor of orthopedic surgery, Orthopedic Research center, Mazandaran University of Medical Sciences, Sari, Iran.

3. Young Researcher and Elite Club, Islamic Azad University, Kazerun Branch, Kazerun, Iran.

4.General practitioner, Mazandaran University of Medical Science, Sari, Iran.

5. Medical Student, Ramsar International University, Mazandaran, Iran.

Corresponding author: Mehran Fazli Email: mehran222@gmail.com

Abstract

Objective: Femoral neck fracture is associated with several complications and poor prognosis. This study design to survey the complications of femoral neck fracture.

Methods: We design a descriptive analytical study. All patients with femoral neck fracture from March 2012 to March 2014 who referred to Imam-Khomeini Hospital of Mazandaran University of medical sciences at Sari city were enrolled to this study. Patients were follow for 12 months. Patient's demographic data, radiologic data, type of treatment (surgery or supportive Therapy) and type of complication were recorded.

Results: from 72 patients how referred to our center, 50 patients (28 men) with mean age of 58.43±6.73 years complete the study. There was not significant difference between men and women age (56.5±21.17 *vs.* 59.72±16.38 years, P=0.55). 22 cases (40%) (7 men) by arthroplasty, 13 cases (26%) (10 men) by cannulated screw fixation and 15 cases (30%) (11) by dynamic hip screw (DHS) were treated. 14 patients (28%) including 4 men and 10 women were afoul complications that included avascular necrosis (3 patients), dislocation of prosthesis (2 patients), pulmonary embolism (one patient), intraoperative femoral shaft fracture (one patient), relocation of screw and shortening of the femoral neck (2 patients) and death in 5 patients who all of them were women (mean age of 79.35±5.81 years) and surgery by arthroplasty technique. morbidity and mortality were significantly higher in women (p=0.007)

Conclusion: morbidity and mortality were significantly higher in women. arthroplasty associated with high rate of complication and death, especially in older patients.

Keywords: *Femoral neck fracture, complications, arthroplasty, internal fixation.*

Introduction

Femoral neck fracture is one of the most common fractures associated with several complications. This fracture prevalence is about 3%and consider as a public health problem in societies(1). Femoral neck fracture is associated with rising average age of the population in industrialized countries. It is estimated that the incidence of this fracture will be double by 2050(2, 3).Before puberty, damage to the upper femoral growth plate, the loss of integrity and short limbs; in middle-aged and young patients, avascular necrosis, osteonecrosis and nonunion fracture and in elderly patients, joint replacement and prosthesis insertion are the main complication of femoral neck fracture. Most of the complications can be seen in young and middle-aged people (4). Other complication included: infection after surgery, deep vein thrombosis (DVT), pulmonary embolism (PE), mental confusion, delirium, dementia, pneumonia and urinary tract infection. Also, Nerve and vascular injuries was occurring rarely(5).

The most common treatment methods of femoral neck fracture are open surgery, internal fixation by cannulated screw and arthroplasty in older age

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patients (6). The prevalence of femoral neck fracture complications is associated with surgery time and several other variables and maybe affected by delay in operation and inadequate follow-up of patients. The complication type and rate were reported different indifferent parts of the world(7, 8). Since, we design this study to survey the complications of femoral neck fracture.

Methods

2.1. Study design

We design a descriptive analytical study. All patients with femoral neck fracture from March 2012 to March 2014 who referred to Imam-Khomeini Hospital of Mazandaran University of medical sciences at Sari city were enrolled to this study.

Our inclusion criteria included all patients who referred to emergency department with a displaced intracapsular femoral neck fracture in either radiographic plane. Patients with history of bed ridden before fracture, were unfit for arthroplasty according to the anesthesiologist, had history of hip pathology or surgery, had a pathological fracture and had more than 96 hours' delay between fracture and treatment were excluded.

Patients were evaluated in their admission period and were follow-up in the outpatient clinic after 3, 6, and 12 months. Patient's demographic data, radiologic data, type of treatment (surgery or supportive Therapy) and type of complication were recorded.

2.2. Statistical Analysis

Data were entered into computer using the SPSS version 18. Patient's characteristics were described using means, standard deviations, and percentages wherever appropriate. We used the chi-square test for comparisons of categorical variables and Student t test for continuous variables. p values < 0.05 were considered statistically significant.

2.3. Ethics

The study was approved by the Regional Committee of Mazandaran University o medical sciences Research Ethics Committee. Patients were enrolled to study with signed an informed consent and could leave study whenever they wanted.

Results

About 72person referred to our center with femoral neck fracture. 14 patients had not filled our inclusion criteria and 8 patients refused to participate in the study. Finally, 50 patients (28 men) with mean age of 58.43±6.73 years complete the study. There was not significant difference between men and women age (56.5±21.17 vs. 59.72±16.38 years, P=0.55). 26 cases (52%) (14 men) had a fracture on the right side, 22 cases (44%) (12 men) had a fracture on the left side and 2 cases (4%) (one male and one female) had fracture on either side of the femoral neck. No significant relationship was founded between gender and location of the fracture. Of the 50 patients with femoral neck fracture, 22 cases (40%) (7 men) by arthroplasty, 13 cases (26%) (10 men) by cannulated screw fixation and 15 cases (30%) (11) by DHS weretreated. There was observed a significant difference between gender and type of surgery (p=0.002).

3.1. Follow up and Complication:

14 patients (28%) including 4 men and 10 women were afoul complications or death. Morbidity included avascular necrosis in 3 patients, dislocation of prosthesis in 2 patients, pulmonary embolism in one patient, intraoperative femoral shaft fracture in one patient, relocation of screw and shortening of the femoral neck in 2 patients were observed. Furthermore, mortality was observed in 5 patients who all of them were women with mean age of 79.35±5.81 years old and surgery by arthroplasty technique. Arthroplasty had more complication and mortality in compare with DHS and cannulated screw fixation techniques (table 1).

31.8% of women experienced complications and all deaths occurred in women (22.7% women), while the complication rate was 14.3% in men. morbidity and mortality were significantly higher in women (p=0.007) (table 2).

4. Discussion

Femoral neck fractures are one of the important problems of health system and has always been a major challenge for orthopedic surgeons. The annual incidence of these fractures in the US increased from 250 thousand in 1995 to 340 thousand in 2005 and is forecast to increase in 2040 to reach about 500 thousand(2, 9). These fractures have poor prognosis and 1/3 of the patients die within a year of the fracture(3, 4). Only about 30-40% of patients with femoral neck fractures, regains their pre-fracture mobility(6, 7).More than 50% of these patients become immobile and permanent disability and need help to perform daily activities. Therefore, their quality of life and health status werereduced severely (8). So, we design this study to survey the prevalence of femoral neck fracture complications in our patients.

In our study 28% of patients had complication and the most complication was death that related to older age. Femoral neck fracture, especially in elderly patients, is associated with about 20-36% of mortality and morbidity at one year after injury(10, 11). In these patients, the incidence of nonunion and avascular necrosis is about 17 to 33% and 25%, respectively(12-14). Also, about 35% of these

Table 1. The relationship between complications and type of operation

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Type of complication	Surgery technique	
	arthroplasty	DHS Or cannulated screw fixation
dislocation of prosthesis	2 (9.1%)	0
avascular necrosis	0	3 (10.7%)
pulmonary embolism	1(4.5%)	0
relocation of screw and shortening of the femoral neck	0	2 (7.1%)
intraoperative femoral shaft fracture	1 (4.5%)	0
Death	5 (22.7%)	0
sum total	9 (40.9%)	5 (17.8%)

Table 2. The relationship between complications and Sex

Type of complication	gender	
	men	women
dislocation of prosthesis	2 (7.14%)	0
avascular necrosis	1 (3.57%)	2 (9.1%)
pulmonary embolism	0	1 (4.5%)
relocation of screw and shortening of the femoral neck	1 (3.57%)	1 (4.5%)
intraoperative femoral shaft fracture	0	1 (4.5%)
Death	0	5 (22.72%)
sum total	4 (14.28%)	10 (45.45%)

patients will need reoperation(15). In addition, results showed that the rate of complications and mortality was higher in women. The main reason cited for this is the greater incidence of osteoporosis in women after the age of menstruation and decreased approximately 75% of cortical bone mass and 40% of trabecular bone mass in older women(16-18).

In all age, treatment of fractures without displacement was done by fixation the fracture with screws or DHS, but in the case of fractures with displacement, there are several opinions. More controversy was find about patients older than 60 years. Some surgeon treated of these patients by hip replacement (arthroplasty) and others by reduction and internal fixation (19, 20). Complications such as non-union or necrosis of femoral head by impaired blood circulation of femoral head and the inability to keep reduction and inefficient internal fixation, especially when the turnover is high at the fracture site, causing fracture fixation were not sufficiently acceptable and associated with a second surgery, especially in older people(21). The results of internal fixation in many studies with two-year follow-up is disappointing and between associated with failure in 35-50% of patients. For this reason, arthroplasties (hemi or total) consider as a reasonable and appropriate choice(22-24). However, in our study arthroplasty associated with high rate of complication, especially in older patients. Furthermore, all deaths of our patients were observed in arthroplasty group. These results are inconsistent with other studies; more studies are needed.

In conclusion, our study showed women with femoral neck fracture had significantly higher morbidity and mortality rate. Also, arthroplasty associated with high rate of complication and death, especially in older patients.

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