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Early Complications of THR in Elderly Patients with Fracture Neck Femur Regarding Time of Surgery

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Abstract: Improvement of living condition along with better health services worldwide will rise life expectancy of peoples, so the number of elderly persons will be increased, this number expected to be double by the year 2040. Forty patients included in the study whose were put in one of two groups, the group I was 16 patients underwent early surgical intervention while group II was 24 patients felt in the second group with delayed surgery. Gender of the patients was varied in both groups; in group I there are 6 males and 10 females while in delayed group (II) females were 14 in number and 10 males. Fracture neck of femur is a common geriatric orthopedic problem where approximately half of the women and 20% of men had lifetime risk for sustaining this injury after the age of 65 year. Delayed surgery do not associated with high incidence of complications or death but associated with prolonged hospitalization postoperatively. Optimization of patient medical condition and rapid reversing of comorbidity are vital for decreasing complications. Early surgery is better than late intervention.

Keywords: Complication, Femur, Surgery.

INTRODUCTION

Improvement of living condition along with better health services worldwide will rise life expectancy of peoples, so the number of elderly persons will be increased, this number expected to be double by the year 2040[Miyamoto, R. G. *et al*., 2008]. Those individuals mostly with chronic health conditions and increase prevalence of falls, when this condition associated with osteoporosis/low bone mass may lead to hip fracture after exposure to low energy trauma, so the prevalence of this hip problem will be higher concomitantly with increase population number [Osnes, E. K. *et al*., 2004]. Hip fractures remain a significant public health concern because of its impacts on the patients' life, like increased mortality rate, inability to gain previous living state and mobility limitation [Osnes, E. K. *et al*., 2004]. In addition, patient complain from decreased quality of life, need more care and supervision[Hall, S. E. *et al*., 2000; Randell, A. G. *et al*., 2000] and other osteoporotic fractures like "contralateral hip fracture and spine wedge fracture" [Scaglione, M. *et al*., 2013; Faucett, S. C. *et al*., 2010] . Economically there is increase in the costs related to direct and Long-term medical cost, home modification and nursing costs, which make burden on the patients himself and health system. Management of hip fracture had some known risks especially with surgical intervention, many factors may affect the choice of treatment including, but not limited to: associated injuries the patient may present with, as well as the individual's co-morbidities, and/or specific patient characteristics including low bone mass and osteoarthritis. Prognostic factors effecting the management and outcome of hip fracture has been studied too to boost our knowledge especially when most of the cases treated with joint replacement with satisfied outcome, time to surgery may be decisive. Some studies report that preoperative delay might lead to an increase in mortality and adversely influence other clinical outcomes such as infection and pressure sores [Moja, L. *et al*., 2012]. Therefore, we conducted clinical study to answer the following question: Is delay in surgical intervention with total hip replacement for fracture neck of femur in elderly patients more than 72 hours associated with increase risk of short-term complications rate?

Anatomy of the hip Joint [Drake, R. L. *et al*., 2007. *et al*., 2007**]**

The hip joint is a synovial articulation between the head of the femur and the acetabulum of the pelvic bone. The joint is a multiaxial ball and socket joint designed for stability and weight bearing at the expense of mobility. The articular surfaces of the hip joint are the spherical head of the femur and the lunate surface of the acetabulum of the pelvic bone. The acetabulum almost entirely encompasses the hemispherical head of the femur and contributes substantially to joint stability. Ligamentum teres of the femur is a flat band of delicate connective tissue that attaches at one end to the fovea on the head of the femur and at the other end to the acetabular fossa, transverse acetabular ligament, and margins of the acetabular notch. It carries a small branch of the obturator artery, which contributes to the blood supply of the head of the femur. Synovial membrane attaches to the margins of the articular surfaces of the femur

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and acetabulum, forms a tubular covering around the ligament of the head of the femur, and lines the fibrous membrane of the joint (Fig. 1).

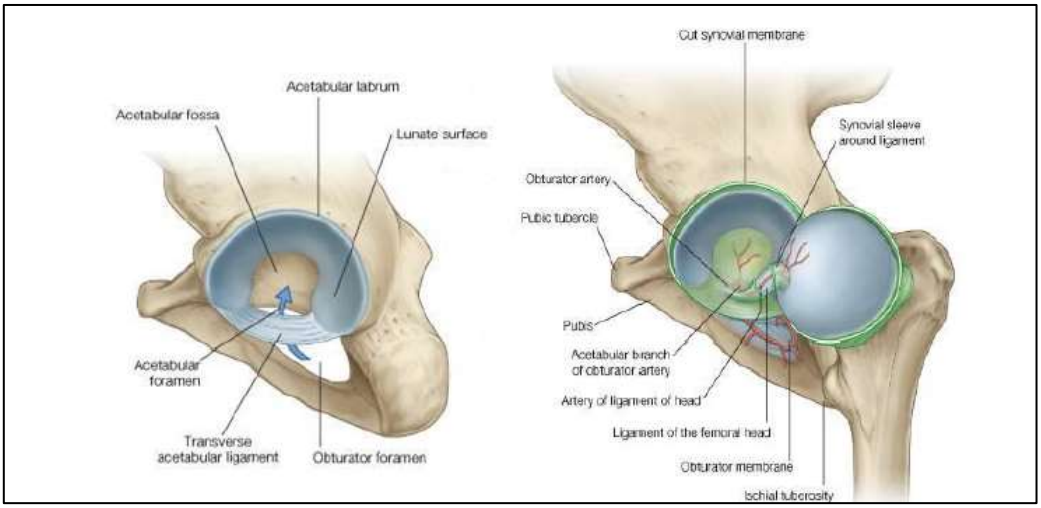

Fig. 1: Hip join anatomy. The head of the femur has been laterally rotated out of the acetabulum to show the ligament. From Grey's Anatomy for student, Elsevier Inc. 2007

The capsule that encloses the hip joint is strong and generally thick. Medially, it is attached to the margin of the acetabulum, the transverse acetabular ligament, and the adjacent margin of the obturator foramen Laterally, it is attached to the intertrochanteric line on the anterior aspect of the femur and to the neck of the femur just proximal to the inter-trochanteric crest on the posterior surface of femur (Fig. 2).

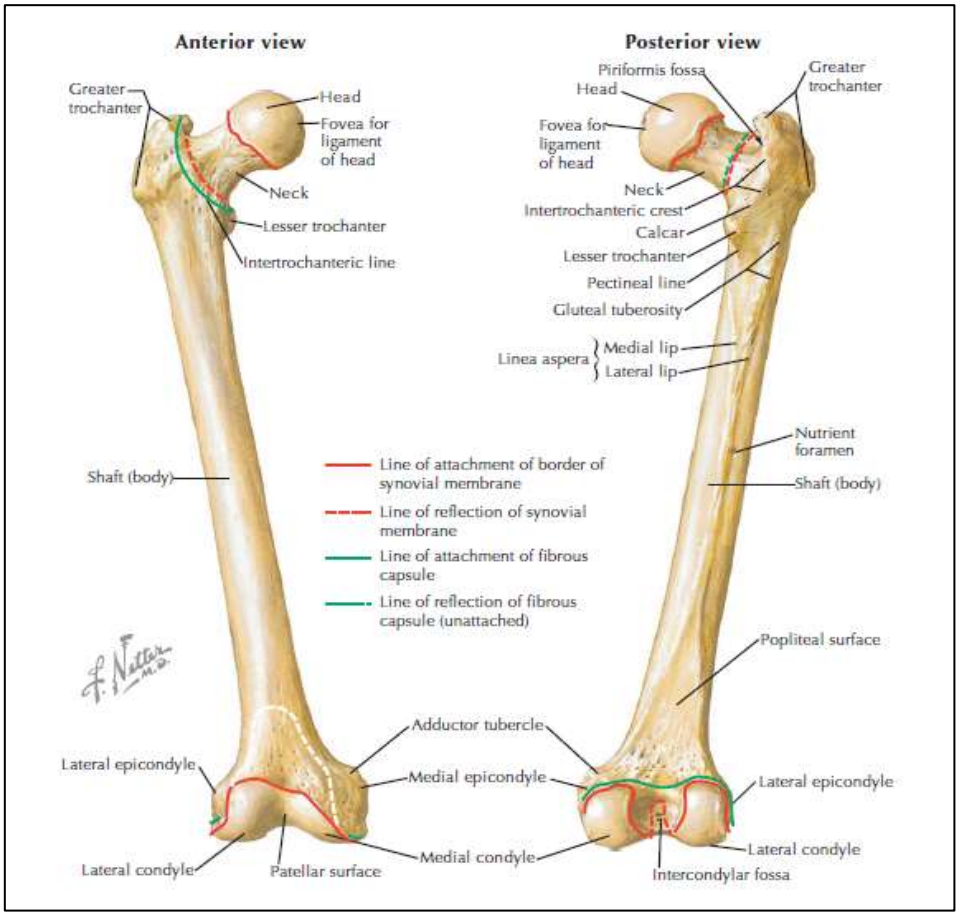

Figure 2: anatomy of femur bone from Netter's Concise Orthopaedic/ Sunder Elsevier 2010 [Drake, R. L. *et al*., 2007]

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Vascular Anatomy [Morgan, S. J. *et al*., 2014]
The medial femoral circumflex artery is the main blood supply to the femoral head. This artery terminates in the posterior aspect of the extracapsular arterial ring. The lateral femoral circumflex artery gives rise to the anterior aspect of the arterial ring. The superior and inferior gluteal arteries also contribute branches to the ring. The ascending cervical arteries originate from the extracapsular arterial ring and are divided into four distinct groups based on their anatomic relationship to the femoral neck: lateral, medial, posterior, and anterior. The lateral group of ascending branches is the main blood supply to the femoral head. The ascending branches give off multiple perforator vessels to the femoral neck and terminate in the subsynovial arterial ring located at the margin of the articular surface of the femoral head. The lateral epiphyseal artery then penetrates the femoral head and is believed to be the dominant blood supply to the femoral head from this system. Fractures that disrupt the ascending blood flow to the lateral epiphyseal vessel have increased risk of osteonecrosis. The artery of the ligamentum teres arises from either the obturator or medial femoral circumflex artery. It does not provide sufficient blood supply to maintain the viability of the femoral head as fig.3 show.

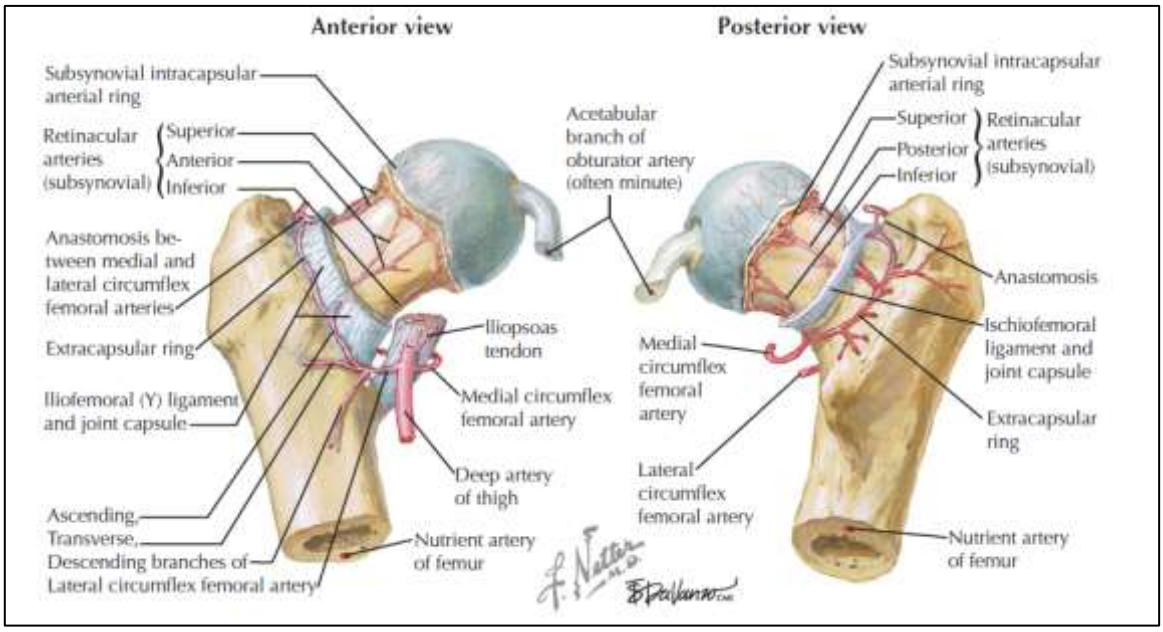

Fig.3: vascularity of femoral neck from Netter's Concise Orthopaedic/ Sunder Elsevier 2010 [Drake, R. L. *et al*., 2007]

Anatomical consideration of fracture neck of femur[Morgan, S. J. *et al*., 2014]
Fractures of the proximal femur are distinguished by their anatomic location in relationship to the joint capsule. Femoral neck fractures are considered intracapsular fractures, which are at higher risk of nonunion because they can be enveloped by synovial fluid. Because of the absence of periosteal or extra osseous blood supply, no callus forms during healing. Rather, fracture healing occurs by intraosseous bone healing.

Epidemiology of fracture neck of femur[Morgan, S. J. *et al*., 2014]
Hip fractures occur most commonly in patients 70 years of age or older. The risk of hip fracture increases with decreasing bone mass, increasing age, Caucasian race, medical comorbidities, tobacco smoking, alcoholism and previous fractures. Hip fractures are more common in women than men with ratio 3 / 1. Femoral neck fractures are slightly less common than intertrochanteric fractures and account for approximately 40% of proximal femur fractures, Intertrochanteric fractures are more common than interacapsular with increasing age Subtrochanteric fractures are pathological in 25 % of cases.

Mechanism of injury of fracture neck of femur [Drake, R. L. *et al*., 2014]
Hip fractures in the elderly are generally the result of low-energy trauma. Frequently, the patient sustains the fracture as a result of a fall from a standing height. A fall to the side that impacts the greater trochanter is more likely to cause a fracture. External rotation of the distal extremity and the tethering of the anterior femoral capsule can result in posterior comminution of the femoral neck. One method of fracture prevention is

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training in fall prevention; protective padding has demonstrated efficacy but is often not practical.

Risk factor for fall:

Intrinsic factors :

History of fallen, impaired mobility or gait, increase age, impaired cognition or vision. Medical comorbidities like cardiovascular disease, chronic obstructive lung disease, depression, arrhythmia and nutritional defect.

Extrinsic factors :

Environmental hazard (poor lighting, slippery floor, and uneven surface)

Inappropriate walking aid footwear or clothing

Exposure to risk

Most inactive elderly persons are exposed to more risk .

Clinical evaluation[Drake, R. L. *et al*., 2014]

The injured extremity is usually shortened and externally rotated. A careful examination of the extremity should be performed, with particular attention given to skin condition and neurologic status. Undisplaced impacted fracture may present only with mild pain with normal limb attitude and even with good range of movement. In the geriatric population, a careful evaluation for medical comorbidities should be undertaken. The number of comorbidities is directly related to 1-year mortality figures: Patients with four or more comorbidities have been reported to have a higher 1-year mortality rate than patients with three or fewer. In the high-energy trauma patient, a systematic search for other injuries should be undertaken as well as a careful secondary assessment of the injured extremity for associated fractures.

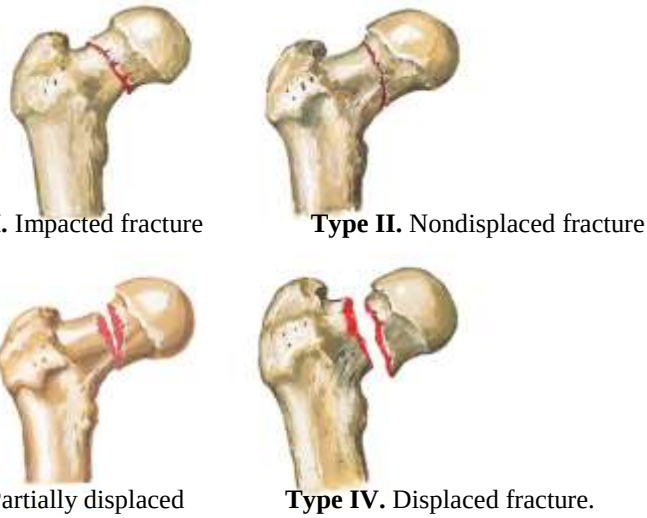
Radiographic evaluation[Drake, R. L. *et al*., 2014]

An AP radiograph of the pelvis, an AP of the hip, and a cross-table or frog lateral are required for diagnosis and preoperative planning. Normal radiographs do not exclude a hip fracture; 1 % of patients with hip pain have an occult fracture. MRI to evaluate for the presence of an occult fracture is recommended when it can be performed in the acute setting. Alternative imaging studies include CT and bone scan. The sensitivity of bone scan is increased by waiting 24 to 72 hours following injury.

Classification[Drake, R. L. *et al*., 2014]

Garden classification fig.4 . This system divides fractures into four types based on the degree of displacement . The interobserver agreement for this classification scheme as originally described is poor. Interobserver agreement increases significantly, however, when type I and type II fractures are combined and considered nondisplaced, and type III and type IV patterns are combined and considered displaced. The risk of nonunion and osteonecrosis is similar within the combined classification schemes.

AO/OTA classification. This classification system subdivides fractures based on location in the femoral neck and degree of displacement. The femoral neck is divided into subcapital, transcervical, and basicervical regions. This system is used mostly for research purposes.



Type I. Impacted fracture **Type II.** Nondisplaced fracture

Type III. Partially displaced **Type IV.** Displaced fracture.

Vertical fracture

Fig 4: Garden classification from Netter's Concise Orthopedic/ Sunder Elsevier 2010 [8]

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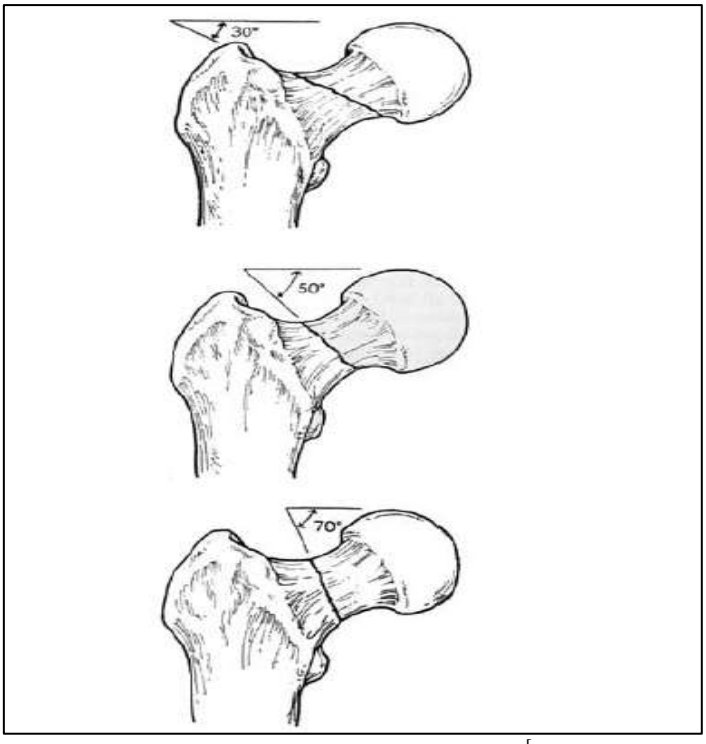

Fig. 5: Pauwels classification of femoral neck fractures[Drake, R. L. *et al*., 2007].

Aim of the surgery: Anatomical reduction and stable internal fixation or prosthetic replacement to minimize pain, restore function and allow rapid rehabilitation. All extracapsular fracture treated by internal fixation unless has significant hip osteoarthritis that need calcar replacement prosthesis

Nonsurgical treatment[Drake, R. L. *et al*., 2014]
Nonsurgical treatment is reserved for high-risk patient to surgery, Nonambulatory patients, patient in the terminal stages of life, Late presentation with sign of healing and early weight bearing. Patients refuse surgical intervention. In general, acute pain can be controlled with narcotic medication and will subside in the first few days to a week, allowing transfers in the nonambulatory patient that are tolerable for the staff and patient. Nonsurgical treatment can be considered for a nondisplaced femoral neck fracture, but the reported incidence of late displacement is between 15% and 30%. Compression-related stress fractures can also be considered for nonsurgical treatment, but close follow-up and restricted weight bearing are required.

Surgical treatment[Drake, R. L. *et al*., 2014]
Nondisplaced fractures:- The outcome is poor for displaced femoral neck fractures, so nondisplaced fractures should be stabilized to prevent late displacement. In surgically treated nondisplaced femoral neck fractures, the risk of late displacement is between 1% and 6%. Transcervical and subcapital fractures are best treated with percutaneous placement of three partially threaded compression screws (canulated hip screws) or cab done by direct lateral approach. The screws should be started at or above the level of the lesser trochanter on the lateral cortex to minimize the risk of subsequent subtrochanteric fracture. This procedure started with use guide wires and insertion of partial threaded screws in inverted V shaped pattern that are parallel in femoral head. Screws should be placed in the periphery of the femoral neck to gain the support of the residual cortical bone to resist shear forces and within 5 mm of the articular surface to gain purchase in the subchondral bone. Care should be taken not to penetrate the articular surface, and multiplanar fluoroscopy should be used to confirm that no intraarticular penetration has occurred. Basicervical fractures behave like intertrochantericfemur fractures and should be surgically stabilized with a sliding hip screw that allows controlled compression of the fracture. This fracture pattern has less inherent rotational stability than an intertrochanteric fracture, so an additional parallel screw should be placed to resist rotational forces.

Displaced fractures
Open reduction and internal fixation
In the young patient with high-energy trauma or in the active elderly patient without preexisting

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arthritis, reduction and fixation of the displaced femoral neck fracture with the previously described techniques should be attempted. The key factor in preventing nonunion, loss of fixation, and osteonecrosis is the quality and maintenance of the reduction. Closed reduction can be attempted, but the reduction needs to be anatomic. If closed reduction is unsuccessful, open reduction with an anterolateral or anterior approach to the hip should be performed. When closed reduction techniques are used in high-energy fractures, a capsular release may help to diminish the risk of osteonecrosis by relieving the capsular pressure on the ascending branches.

Hemiarthroplasty[Drake, R. L. *et al*., 2014]
Hemiarthroplasty should be considered in the low-demand individual of advanced physiologic age or chronologic age older than 80 years. Short-term outcomes are similar for unipolar and bipolar prosthetic designs, but in patients followed for >7 years, those with a bipolar prosthesis appeared to have better function. A cemented technique is preferable in most patients who are ambulatory. Uncemented technique is associated with greater postsurgical pain and higher revision rates. An uncemented prosthesis has usually been reserved for minimal ambulators.

Outcomes: Risks of infection 9%, bleeding, scar, pulmonary embolism, neurovascular compromisation, dislocation 1-2 %, limb length discrepancy, and periprosthetic fracture.

Total hip arthroplasty[Drake, R. L. *et al*., 2014]
The primary indication for THA has been an arthritic
symptomatic hip joint. all patients who are able to walk outdoor with no more use of a stick Not cognitively impaired, Fit for anesthesia . Recent studies suggest that for displaced femoral neck fractures, functional outcomes are better with THA than with hemiarthroplasty. This topic remains controversial. Pathologic fracture of the femoral neck is also an indication for THA.

Complications after total hip arthroplasty :- Dislocation and wound infection are the two major complications of THR (Katz, J. N. *et al*., 2003; Mahomed, N. N. *et al*., 2003) as observed in other hip surgeries like hemiarthroplasty (Ahmad, I. *et al*., 2006). The incidence of dislocation after THR ranges between 2- 5% (Berry, D. J. *et al*., 2004; Ahmed, I. *et al*., 2005). There is paucity of data pertaining to the risk factors of complications of THR from developing countries. Comparison with data from developed world may be unjustified because of difference in case mix, surgical practices, and quality of care, financial and social conditions. However, studies from the developed countries demonstrated that various factors are implicated in affecting rates of dislocation including: Patient factors, such as gender, weak hip musculature, excessive alcohol intake, smoking, body mass index (Azodi, O. S. *et al*., 2006) primary disease/indication (Bongartz, T. *et al*., 2008) and age. Surgical factors, such as surgical approach, capsular excision or repair, positioning of implant, and previous hip surgery(Bongartz, T. *et al*., 2008; Paterno, S. A. *et al*., 1997) Implant factors, such as femoral neck length, offset and head diameter (Blom, A. W. *et al*., 2008). Most previous studies on orthopaedic patients have reported an increased risk of postoperative infections, short-term mortality, length of hospital stay and intensive care unit stay in patients receiving blood transfusions (Pedersen, A. B. *et al*., 2009). Marik and Corwin published a systematic review based on 45 cohort studies, suggesting that transfusion are associated with increased morbidity and mortality risk in high risk hospitalized patients(Marik, P. E. *et al*., 2008).

The rates of complication are as follow:
1. Mortality: 30 % in the first year, increase with advance age and medical problem
2. Nerve injury: 1-2 %
3. Infection: 1–2 % in osteoarthritis, 5 % in rheumatoid arthritis. In fracture neck of femur: Superficial 5-15 %, deep 3%.
4. Thromboembolism; deep vein thrombosis: 2 %
5. Pulmonary embolism (PE): 1 %
6. Dislocation: 3 %.
7. Heterotopic ossification: 10 % (majority are asymptomatic)
8. Limb length discrepancy: 15 %.
9. Loosening: revision surgery is required for loosening in up to 2- 10 % at 15 years
10. Component failure: stem fracture, locking mechanism failure in uncemented cups and other failures of components are rare, but recognized Complications (Miles, J. *et al*., 2010).
11. Acetabular wear 4-20 %
12. Wound hematoma 2-5%
13. Periprosthetic fracture 1-3 %

Patients and methods:- Prospective cohort study conducted from October 2014 to December 2016 at orthopedic department of Baghdad medical city complex (Ghazi Al-Hariri specialized surgery hospital and nursing home hospital) and Al-Bishara private hospital.

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Inclusion criteria:
Age > 60 years.
Displaced femoral neck fracture (Garden 3 & 4) treated by total hip replacement.
Mild – moderate risk of anesthesia according to ASA [Drake, R. L. *et al*., 2014].

Exclusion criteria
Patients age < 60 years old.
Non-ambulatory.
Neurological disease.
High-risk patients for anesthesia (ASA> 3).
Pathological fracture.
Multiple fractures.
Revision surgery for fracture neck of femur.

The patients were assessed at the time of presentation by detailed history with special attention to mechanism of injury that was low energy trauma in all patients time since injury, associated comorbidity and preinjury level of activity. Full laboratory and radiological evaluation also had been done and cooperation with other medical specialty physicians was undertaken to optimize patient condition and control associated problem. Then the patients were divided into two groups first group(I) the control group where the surgical intervention was done within 72 hours from injury , while the second group (II) include the patients whom surgery delay after 72 hours from injury for different causes. The patients consent was taken; total hip arthroplasty was done by more than one surgical team but with same protocol of surgery, under general or spinal anesthesia, lateral position and posterior approach for all patients. The surgery continue with reshaping neck osteotomy and head extraction, preparation and reaming of acetabulum and insertion of acetabular component. The femoral side also underwent canal preparation, reaming, insertion of trail, balancing the hip and finally insertion of prosthesis and reduction with closure layer by layer. We used two different prosthesis manufacturing, regarding type of prosthesis the choice of cementless or cemented type depending on preoperative planning. After 12 hours, the anticoagulant therapy started and continued for 28 days, with early physiotherapy as distal joint movement at day zero, antibiotic (third generation cephalosporin) started with anesthetic induction with postoperative day one and then continued on oral antibiotic (cefixime 400mg cap.) for 5 days postoperative. Analgesia given as patient need under direct surgeon supervision. Patients started sitting and standing in the second day. Length of hospital stay for the patient varied from 3-10 days depending on patient general condition. The follow up at outpatient clinic was scheduled at 1, 2, 4, 6, 8 weeks postoperatively, during the follow-up the following data was observed like infection , dislocation , bed sore , symptomatic thromboembolism which the confirmed by Doppler ultrasonography.

Outcome measure: The two group compared by complication rate which include : mortality rate , bed sore, hematoma formation , surgical site infection, hospital stay duration , dislocation , thromboembolism complications and cardiac ischemia in addition to chest infection.

Statistics:- Statistical analyses were performed using SPSS statistical package for Social Sciences (version 17.0 for windows, SPSS, Chicago, IL, USA). Data are presented as mean ± standard deviation for quantitative variables and as number and percentage for qualitative variables. Differences between groups were evaluated with Student's t-test for quantitative data. Qualitative data were analyzed by Chi square test.

P value of <0.05 was considered statistically significant.

RESULT

40 patients included in the study whose were put in one of two groups, the group I was 16 patients underwent early surgical intervention while group II was 24 patients felt in the second group with delayed surgery. Gender of the patients was varied in both groups; in group I there are 6 males and 10 females while in delayed group (II) females were 14 in number and 10 males as in chart 1.

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Chart 1: gender of patients in each group

Those patients age was similar in both groups regarding range and mean age, where in early group I (range 62- 80 years , mean 68.8 years) while in Group II (range 62-84 years , mean 68.6 years). The anesthesia risk according to American Society of Anesthesiologists (ASA) classification for each group was shown in chart 2 below.

Chart 2: Anesthesiologists (ASA) classification for each group

Because of the anesthetic risk, most of surgeries were done under spinal anesthesia as in following chart 3.

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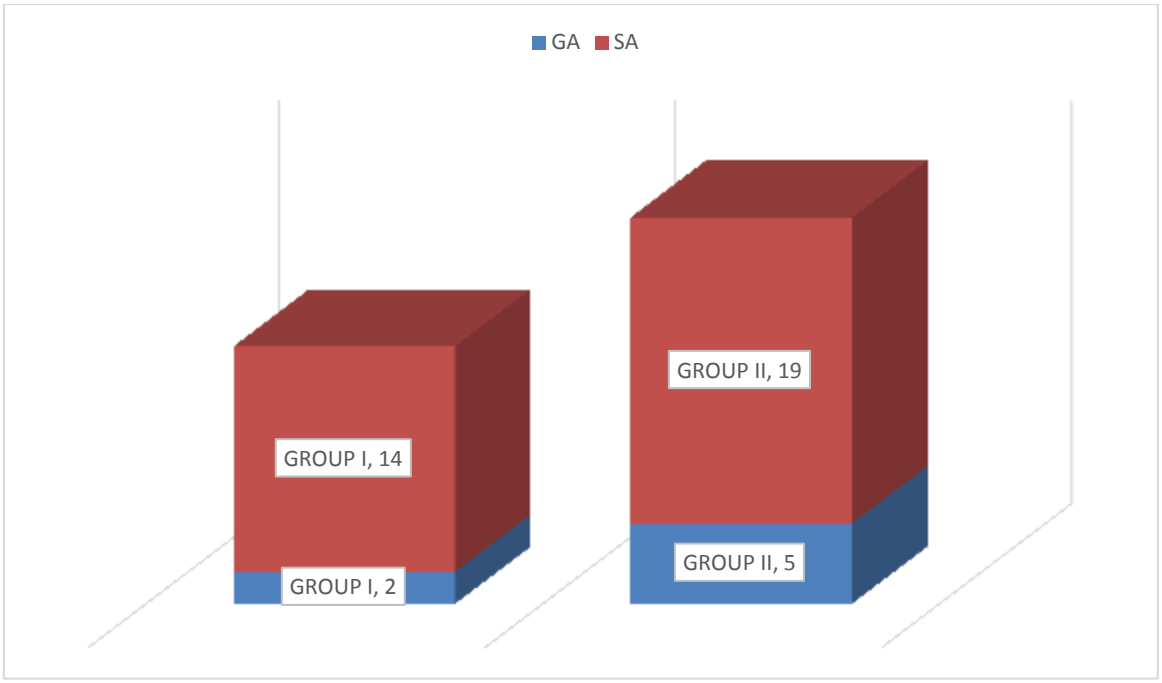

Chart 3: Type of anasthesia

Time to surgery was calculated in both groups, as the main issue need to be assessed, in early group (I) it was 2-3 days with a mean of (2.5 days), while in group II the time ranged from 7-180 days with mean (23.3 days). The prosthesis used were belong to two different manufacturing with cementless type more common depending on preoperative planning and intraoperative finding ,where 5 cases with cemented type in group I and 11 case in group II as show in below chart 4.

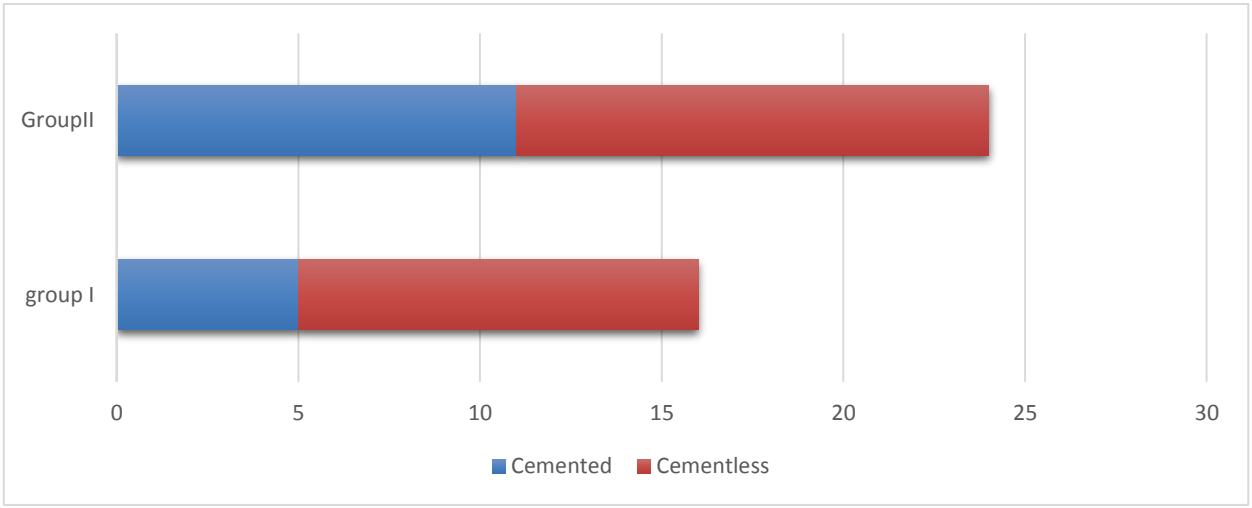

Chart 4 : Type of prosthesis

Comorbidities were presented in most of the patients with excluding renal disease and heart failure , hypertension has been observed in equal number in both group 11/16 in group I and 11/24 group II. While 13 / 24 patients in delayed group (II) had DM, that compared to 8 /16 in group I as in table 1 show.

Table 1: the patient's comorbidities

	Total patient	DM	HT	Both DM &HT
Group I	16	8	11	6
Group II	24	13	11	6
total	40	21	22	12

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Two patients in delayed group (II) developed bedsore during the waiting period until surgery, where none had this complication of Group I. Regarding length of hospitalization postoperatively for the first group I range from (3-6 days with mean 4 days), the second group admission time was range from (3-10 days with mean 5.4 day)

Chart5: Postoperative hospital stay

Complications had been occurred in both groups, Details about the complications described by table 2 that show the incidence rate of each complications

Table 2: complications rate in both group

Complication	Group I	Group II	Total
Mortality	0%	4%	2.5%
Hematoma	6.25%	25%	17.5%
SSI	12.5%	12.5%	12.5%
DVT	0%	8.33%	5%
PE	0%	0%	0%
Chest infection	0%	8.33%	5%
MI	6.25%	0%	2.5%
Dislocation	6.25%	8.33%	7.5%

The total patients developed complications in first group (I) were 5patients, and in delayed Group (II) were 13 patients , chart 6 revealed this problem.

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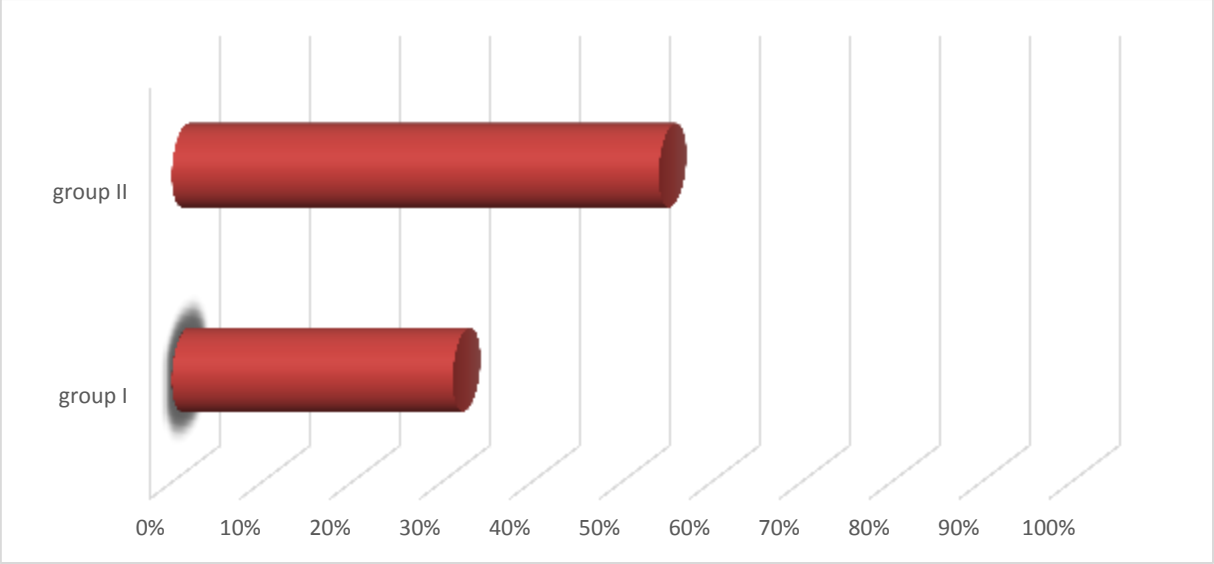

Chart 6: Percent of patient devlop complications

Statistical analysis showed there was no significant relation of timing for surgery to complication as death, hematoma, SSI, DVT, MI, PE, dislocation, infection, and bedsores. The statistical significance were appeared in correlation between time of surgery and length of hospitalization postoperatively in patients with delayed surgery resulted in prolonged hospital stay for patient in that group (r = 0.458, P = 0.003).

DISCUSSION

Fracture neck of femur is a common geriatric orthopedic problem where approximately half of the women and 20% of men had lifetime risk for sustaining this injury after the age of 65 year [Dennison, E . *et al*., 2006].This type of fracture is considered a potential cause for death or morbidity in elderly patients , so the goals of management is to relief the pain , start early mobilization and rapid return to the preinjury level of activities. Generally, femoral neck fracture surgical treatment must be done in semiurgent basis to decrease the incidence of perioperative complications, improve functional out come and decrease burden on the patients and the health system [Simunovic, N . *et al*., 2010]. The choice of line of management with specific intervention depend mainly on patients factors like the age, bone quality and functional level, in addition to fracture personality and stability. Femoral neck Fractures are displaced in 97% of elderly patients [Keating, J. F . *et al*., 2015], this displacement associated with high risk of avascular necrosis in addition to high failure rate of fixation, so to optimize the outcome arthroplasty is considered the treatment of choice for such fracture, with many controversies regarding the effect of delayed surgery about the outcome. Despite advance in medicine, the mortality rate following hip fracture in elderly patients is still 25% in the first year following surgery and may be higher in men than in women. In our society many elderly patient with fracture neck of femur consult the orthopedic surgeon after period of injury for different reasons like neglecting family, multiple undiagnosed comorbidities need to assess, missed injury and some issue with health facilities. That explained why most of the patients in our study underwent the surgery at delayed time.Tetsuo Hagino, *et al* 2015; described admission during public holiday, joint replacement surgery and change on electrocardiograph reading as cause for surgical delay. Vidán, *et al*., 2012; conclude that the reasons for delayed surgery longer than 2 days is mainly related to availability of operating room for intervention in addition to presence of medical problems at the time of injury. Patients with high risk of anesthesia has been excluded from the study because high rate of complication associated with it and some patients and their family do not except the higher risk of mortality and complications. The definition of delayed surgery in our study was more than 72 hours admission after injury because lack of availability of operating room which lead to difficulties in obtaining the number of patient to do surgery within less time. R Sund *et al*., 2005; also suggested the same time for delayed surgery, when the patients spend 3 night after admission to hospital for fracture neck of femur. Sircar, *et al*., 2007; described early surgery must be did within 48 hours , while Lorenzo Moja *et al*.,2012; in his meta-analysis define cut-off time for the delayed surgery 24 – 48 hours after

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admission. Most of the patients have comorbidities specially hypertension and DM, these factors play very important role in complications incidence and need to be addressed well, Bergeron, *et al*., 2006; conclude the delay for surgery for control of associated comorbidities wasn't effect the outcome , but these conditions partly explains preoperative delay and adverse outcomes which correlate with our study findings. The result of study show statistically insignificant effect of delayed surgery on mortality rate even only one case developed this complication, this patient had also dislocation, and death occurred during trial of closed reduction under general anesthesia. This finding correlated with Rae, *et al*., 2007; in the term of significance but he define early surgery to be done within 48 hours. Pedro, *et al*., 2011; founded that 1-week delay in operation of fracture neck of femur in elderly person did not affect the mortality rate and he recommended to do surgery as early as possible when the medical condition of the patient was optimized. Vidal *et al* [34] concluded that death related to hip fracture in developing countries could be minimized by appropriate time and hospital care. On the other hand, many author [Simunovic, N . *et al*., 2010; Vidán, M. T . *et al*., 2011; Moja, L . *et al*., 2012], recommended early surgery for elderly patients with femoral neck fracture to decrease mortality rate that associated with delayed. This mortality rate was 9.6 % after 30 days and 33 % at one year, and in patient developed postoperative heart failure mortality rate rise to 65 % at 30 days and then 92% death after one year.Where J. Elliotta, *et al*., 2003; described the risk factor for mortality as male gender, Increasing age, a higher ASA score, a lower mental score, Low level of daily activity and longer delay if the surgery did before 24 hours this will yield one survivor person. The short term of our study and the smaller number of the patient may explained why there is no statistical significance in the mortality rate, where R Sund *et al* 28 state that there is slight differences in early postoperative period between early and late groups but the mortality rate significantly increase during one year follow-up period for delayed surgery . Shiga, *et al*., 2008; in systemic review state that if the surgery did 48 hour after admission, it will rise the mortality rate by 41% at 1 month and by 32% at one-year period. Regarding other complications rate, our result show statistically insignificance differences between two groups , the significance was only in duration of hospitalization in delayed group, which correlate with findings of Tetsuo Hagino, *et al*., 2015; regarding shorter hospital stay with early surgery and insignificant changes in the outcome. K. A. Lefaivre, *et al*., 2009; concluded that delay surgery more than 48 hour associated with twofold increase in the risk of complications and this time also associated with prolong hospital stay. Lorenzo Moja, *et al*., 2012; in his meta-analysis and Meta-Regression found that the surgery after 24-48 hour post-injury associated with high risk of death and bedsores, This relation between surgical delay and the complication is also concluded by many studies [Simunovic, N . *et al*., 2010; Sircar, P . *et al*., 2007; Rodriguez-Fernandez, P . *et al*., 2011]. Although the statistical analysis show insignificance differences between two groups but clinical significance still questionable specially some complication like pressure sore which occurred usually after 96 hours from injury and mortality rate . It is important to remember that in femoral neck fracture of the elderly patient with other comorbidities, it is crucial to control medical issues before surgery, because if the surgery performed in suboptimal conditions lead to increased risk of complications and preferably to be done during normal surgical hours [Morgan, S. J, 2014]. In addition to that management of osteoporosis reduce the risk of fracture because of 1/3 of males and ½ female have fragility fracture during their life. Therefore, treatment of patient with osteoporosis started during hospitalization by f vitamin D and calcium supplementations in addition to bisphosphonate to reduce risk of subsequent fractures [Al-Ani, A. N . *et al*., 2009].

THE WEAKNESS OF OUR STUDY

Small sample number, Short follow up period, More than one surgical team, Two different hospitals.

CONCLUSION:

Delayed surgery do not associated with high incidence of complications or death but associated with prolonged hospitalization postoperatively.

RECOMMENDATION

Optimization of patient medical condition and rapid reversing of comorbidity are vital for decreasing complications. Early surgery is better than late intervention.

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