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Do delays in surgery affect outcomes in patients with inter-trochanteric fractures?

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Abstract

Objective: To study the differences in outcomes of early versus delayed surgery in patients with intertrochanteric fractures.

Methods: The retrospective chart review was conducted at Aga Khan University Hospital, Karachi, and comprised data of patients who underwent surgery for intertrochanteric hip fractures from 2005 to 2010. A gap of >48hours between the event and the surgery was considered a delayed procedure and its impact on outcome was assessed.

Results: Of the 190 patients, 138(72.6%) were in the early group and 52(27.3%) in the delayed group. The most common cause for delay of surgery was electrolyte imbalance in 14(27%) patients. Patients with delayed surgery had more comorbidities and higher ASA grades compared to those that underwent early surgery ($p<0.05$). Inpatient mortality was significantly higher in the delayed group ($p=0.006$). Multivariate analysis showed that higher mortality was associated with delay in surgery.

Conclusions: In patients with multiple comorbid conditions, expedited optimisation for surgery may be warranted to reduce mortality.

Keywords: Intertrochanteric fracture, Comorbid conditions, Early group, Delayed group, Mortality. (JPMA 65: S-21 (Suppl. 3); 2015)

Introduction

Hip fracture is defined as a fracture occurring in the area between the lower edge of the femoral head and 5cm below the lesser trochanter.¹ It is quite predictably a matter of global public health concern with 1.6 billion hip fractures being reported worldwide each year.² Most of these fractures occur in the elderly who are already suffering from multiple comorbid conditions. Statistically, in the United States, the incidence of hip fractures is 63 per 100,000 per year in females and 34 per 100,000 per year in males.³

The anatomical classification of hip fractures includes neck of femur fracture, intertrochanteric fracture and subtrochanteric fracture. The neck of femur fracture is termed intracapsular, while intertrochanteric and subtrochanteric fractures are termed extracapsular fractures.⁴ When one delves deeper into the causes of hip fractures, one finds that almost 95% relate to fall, 2% are due to road traffic accidents (RTAs) and <2% are pathological fractures consequent of a metabolic disease.⁵ Hip fractures are associated with advancing age,

increased number of comorbid conditions, such as hypertension (HTN), uncontrolled diabetes, urinary tract infection (UTI) and other causes, and increased dependency on others when performing activities of daily life. The usual patient classically presents with hip pain, inability to bear weight, shortening of the limb and an externally rotated foot.⁶

Given the predominant age group that hip fractures occur in, they are understandably associated with significant morbidity, mortality and disability. It has been found that hip fractures in the elderly having dementia are associated with 5% inpatient mortality and 10% mortality within 30% days of hospital admission.⁷ The time lag between the fracture and obtaining surgery is a crucial factor affecting the overall prognosis of the patient. According to the National Institute for Health and Clinical Excellence (NHS) guidelines for the management of hip fracture, it is recommended that surgery should be ideally performed on the day of admission or the day after admission. Comorbidities should be identified immediately so that surgery is not delayed beyond 48 hours.⁸

The current study was planned to assess the differences in the outcome of early versus delayed surgery in patients with intertrochanteric fractures.

Materials and Methods

The retrospective chart review was conducted at Aga Khan University Hospital (AKUH), Karachi, and comprised

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data of patients who presented with intertrochanteric hip fractures and underwent a dynamic hip screw fixation between January 2005 and December 2010. Those with pathological hip fractures, poly-trauma patients and patients with missing records were excluded. Early surgeries were defined to be those performed within 48 hours of presentation, while delayed surgeries were those performed after 48 hours.⁹ The study population was divided into two groups: early surgical repair group versus delayed surgical repair group.

Descriptive analysis was done to study variables such as age, gender, comorbid conditions, American Society of Anaesthesiologists (ASA) grade and their relation to surgery outcomes based on how much time delay each patient faced before undergoing optimisation and subsequent surgical management.

Results

Of the 190 patients, 138 (72.6%) were in the early group and 52 (27.3%) in the delayed group. In the early group there were 66 (48%) females and 72 (52%) males. In the delayed group there were 28 (54%) females and 24 (46%) males.

In the early group, 54 (39%) patients had no comorbid conditions, while 46 (33%) showed multiple comorbidities. In the delayed surgery group, 36 (69%) patients had multiple comorbid conditions ($p < 0.05$). Most patients in the early group were ASA level II and III, while in the delayed group the majority of patients were ASA level III and IV ($p < 0.05$) (Table-1).

In the pre-injury functional class status, majority of patients in the early group were functional Class I and II, while delayed group patients were in functional Class III with 26 (50%) patients performing daily activities only with external help. In the early group 83 (60%) patients were given general anaesthesia, while in the delayed group regional anaesthesia was utilised in 29 (55%) patients ($p < 0.05$). When observing time of surgery in both groups, 79 (57%) surgeries in the early group and 34 (65%) in the delayed group took place during the daytime working hours.

The most common cause for delay of surgery was

Table-1: American Society of Anaesthesiologists (ASA) level.

P= 0.004	ASA Level				Total
	I	II	III	IV	
Early Group	15	59	59	5	138
Delayed Group	1	10	30	11	52
Total	16	69	89	16	190

Table-2: Postoperative Complications.

	Postoperative complications			
	UTI	DVT	Wound Infection	Mortality
Early Group (n=138)	4	0	3	1
Delayed Group (n=52)	4	1	3	5
P value	0.144	0.27	0.20	0.006
Total (n=190)	8	1	6	6

UTI: Urinary tract infection

DVT: Deep vein thrombosis.

electrolyte imbalance, which was seen in 51 (27%) patients. A further 32 (17%) patients had delayed surgery because of the need for optimisation for other diseases, such as thyrotoxicosis, combined HTN and diabetes mellitus (DM), and UTI with DM.

Around 4 (3%) patients in the early group developed UTI post-operatively compared to 4 (8%) in the delayed group ($p > 0.05$). Wound infection was seen in 3 (2%) patients in the early group compared to 3 (5%) in the delayed group ($p > 0.05$) (Table 2). Around 2 (1%) patients in the early group did not survive compared to 5 (10%) in the delayed group ($p < 0.05$). Multivariate analysis showed that delay in surgery was an independent predictor for mortality ($p < 0.05$).

Discussion

Hip fractures represent an increasingly important healthcare concern as they are associated with significant morbidity and mortality and show a disturbingly escalating incidence in the elderly population.¹⁰ Patient factors associated with a speedy recovery and regaining most of the pre-fracture walking ability after surgery include male gender, young age, absence of pre-existing dementia and use of a walking cane before the injury.¹¹ Other factors relating to an uneventful recovery include factors such as delay in surgery, surgical technique, post-op care and rehabilitation. Despite all efforts, the mortality rate within elderly patients within the first year of fracture repair is reported to be as high as 14-36%.¹²

Generally, an increased mortality rate is seen in patients suffering from multiple risk factors such as advancing age, male gender, poorly-controlled medical conditions, psychiatric issues and nursing home institutionalisation.¹³ However, out of all the risks posing threat to the patient, a few can be very well controlled by the efforts of the primary surgical team alone. These include avoiding operative management before stabilisation of coexisting medical conditions without causing undue delays and minimising postoperative complications with good postoperative care and rehabilitation. Although most of

these factors are universally agreed upon, but surgeons often find it difficult to decide how much of a surgical delay is acceptable in favour of initial medical optimisation of existing comorbid conditions.

There is an inconsistent perception that delay in surgical treatment of hip fracture patients is associated with an increase in postoperative complications and mortality. Some surgeons perceive that the standard of care regarding hip fracture management involves operating within 24 hours of presentation, while others operate on a case to case basis.¹⁴ Many, however, agree that surgery must be attempted at most within 48 hours of presentation for every patient without any medical comorbid conditions.^{15,16} Our study also shows low mortality maybe among patients who underwent surgical fixation within 48 hours of admission. However, studies comparing time to surgery and mortality have generally had conflicting results.¹⁷⁻²² These studies usually had small sample sizes and, hence, their results cannot be generalised.

Grimes et al.²³ in their retrospective study of approximately 8380 patients undergoing surgical hip fracture fixation concluded that delay in surgery seemed to have no adverse effect on patient outcomes if their medical illnesses were adjusted for. This study explored both the primary outcomes in the form of long-term mortality and secondary outcomes as 30-day patient mortality, decubitus ulcers, bacterial infections, myocardial infections and thrombo-embolism. Data was adjusted for medical illnesses which revealed that surgical delay had no effect on patient outcomes apart from developing decubitus ulcers. This is in sharp contrast to our study results with a much smaller sample size which showed that surgical delay is indeed associated with postoperative complications and a higher rate of mortality when compared to patients in the early surgical group.

However, unlike conventional assumptions, surgical delay is not a measure of comorbidity or a higher ASA grade. Our study has recognized surgical delay as an independent factor leading to poor outcomes for a hip fracture surgery patient independent of ASA grade and medical comorbid conditions. In patients with several comorbid conditions, expedited optimisation for surgery may be warranted to reduce mortality.

The limitations of our study include a retrospective design with small sample size and limited follow-up. Future prospective studies need to study outcomes of these patient cohorts from both early and delayed surgery categories. As high-risk patients tend to be optimised

prior to surgery, the bias may explain the potential of higher mortality in the delayed surgery group.

Conclusion

Delay in surgery is associated with increased mortality and postoperative complications leading to a difficult rehabilitation period and significant morbidity. Patients with intertrochanteric fractures should be optimised on a priority basis in order to mitigate the risk of morbidity and high rate of mortality. Patients who are operated after 48 hours have a higher 30-day mortality compared to those who are operated within 48 hours of admission. This association is independent of comorbid conditions and ASA grade. Further large-scale prospective studies need to clarify these potential associations so that hip fracture surgery guidelines can be made evidence-based.

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