Is early mortality related to timing of surgery after fracture femur in the elderly?

Abdallah Al-Omran, MBBS, SSC (Ortho), Mir Sadat-Ali, MS, FRCS, D Orth.

ABSTRACT

Objective: The purpose of this study is to review the outcome of fracture femur in elderly patients (>65 years), and to identify cause or causes of mortality.

Method: Between January 1996 and December 2002, 115 patients over 65 years were admitted and operated at King Fahd University Hospital, Al-Khobar. Fifty-six of patients suffered with femoral fractures. Demographic data collected included age, gender, site of fracture, co-morbidities, delay in surgery, duration of surgery, implant used and Anesthesia Society of America scoring (ASA). A minimum follow up of 12 months was considered important for inclusion in the study. Patients remained alive were assessed for their functional independence.

Results: The data of 48 patients were gathered for analysis. There were 31 males and 17 females with a mean age of 76.5 years (age range 65-101 years). The mean follow up was 32.8 months (12-84 months ± SD 17.81). There were 32 fractures of the trochanteric area. The average delay in surgery was 112 hours (24-280 hours). At the end of 24 months: 13 (27%) were dead and 28 (80%) were functionally independent similar to pre-injury status. There was statistical significance between the ASA score and the mortality (p<0.005). However, mortality significantly higher in patients who underwent surgery under general anesthesia p<0.05.

Conclusions: Our data indicate that the mortality in the elderly is not related to the delay in surgery. The significant factors to early demise of patients were high ASA score, and the type of anesthesia used during surgery.


Morbidity and mortality after trauma in elderly are usually higher as patients over 65 years of age fare badly when compared with the young. It is attributed that high mortality is due to co-morbidities, existing chronic diseases, and a delayed response of the body to the trauma itself. It is estimated that each year 250,000 persons under 65 years of age suffers from the hip fractures, and 13-44% of patients died within 6 months of the injury and 29% succumb within a year. There is a contentious issue regarding the timing of reparative surgery to the mortality of the injured. It was reported that to reduce mortality, early fixation (within 8 hours) of the fracture was essential. Contrary to Tornetta et al study, found no statistical difference between the mortality and the timing of the surgery, which is similar to other studies. Review of literature did not show any study on mortality in the elderly after fracture of the femur in Saudi Arabia and in the coming years the elderly population is bound to increase, hence, early planning for the future could help in the proper management of the elderly. The objective of this retrospective review is to assess the prevalence of fracture femur in the elderly and the mortality rate in relation to the timing of the operative intervention, and to identify the cause or causes which influences mortality among the elderly.

From the Department of Orthopedic Surgery, King Fahd Hospital of the University, Al-Khobar, Kingdom of Saudi Arabia.

Received 1st November 2005. Accepted for publication in final form 8th February 2006.

Address correspondence and reprint request to: Professor Mir Sadat-Ali, Department of Orthopedic Surgery, King Fahd University Hospital, PO Box 40071, Al-Khobar 31952, Kingdom of Saudi Arabia, Tel. +966 505882881. Fax. +966 (3) 8971013. E-mail: drsadat@hotmail.com

507
Methods. The medical records of all patients >65 years of age admitted and operated from January 1996 through December 2002, at King Fahd University Hospital, Al-Khobar, Saudi Arabia, were retrospectively reviewed. Mortality was defined as death due to any cause within 24 hours postoperative. There were 115 patients admitted after trauma. Fifty-six patients suffered femoral fractures. We assess the mortality related to age type of fracture, cause of trauma, co-morbidities, timing of surgery, type of anesthesia, anesthetist’s evaluation, duration of surgery, pre-and postoperative ambulation. The outcome variables measured were as follows: immediate cause of death, intra-operative complications, cause of death after discharge, and post-trauma level of ambulation. These variables were predetermined to complete the data sheet. Patients were called for follow up to assess the functional independence measurement based on 3 parameters: returned to pre-injury status, better than pre-injury status and worse than pre-injury status.

Data were coded and analyzed using the Statistical Package for Social Sciences. Student’s ‘t’ test was used for univariate comparison between the patients who were alive and those who died. We used Pearson’s χ² to compare categorical variables such as delay in surgery, ASA score and so forth. Probabilities of less than 0.05 was considered significant.

Results. Of the 56 patients, 48 met the admission criteria. Eight patients were excluded due to no follow up (minimum 12 months). There was no mortality within 24 hours postoperative. Among the 48, 31 were males and 17 females with a mean age of 76.5 years (age range 65-101 years). The mean follow up was 32.8 months with a range of 12-84 months ± SD 17.81 (Table 1). The majority of the fractures sustained were in the trochanteric region (30) and fractures (18) on the neck of the femur. The most common implant used was Dynamic hip screw in 44 patients. From the anesthetists point of view, patients were made stable before surgery was contemplated. Twenty-two patients had general anesthesia and the rest had epidural and spinal. The mean delay in surgery was 112 hours (24-280 hours). Twenty-eight (80%) regained their functional independence to the pre-trauma status, and 20% became worse after the surgery with regard to preoperative ambulatory status. Two patients died in the hospital on the third and ninth day postoperatively by the end of 12 months, 5 died and 8 more died by the end of the second year due to various causes. There was statistical significance between the ASA score and the mortality (p<0.005). More patients died after general anesthesia as compared to epidural and spinal anesthesia (p<0.001). Others factors such as age, gender, and delay in surgery was non-significant between the surviving and the dead (Table 2).

Discussion. An estimated 1.66 million hip fractures occurred worldwide in 1990, by 2050 the rate is expected to rise to 6.26 million yearly. It is reported that 30% of the people suffered hip fracture died within one year and those who survive, suffer loss of independence due to reduced mobility. Delay in surgery was long blamed to be the sole cause of increased of mortality among patients. The Saudi Arabian population is fast changing and in the next decades it is expected that the population of the elderly will constitute a big portion in the population. In Saudi Arabia, the reported prevalence of fractures in the elderly range from 3.9/1000 to 6/1000. With the increase in number of elderly population in the coming years one can presume the economic burden on the healthcare will be enormous and efficient plans should be put in practice. Hence, early plans are needed to counter this high mortality. It is well known that the mortality in the elderly after fractures are generally higher than any other age group. Perdue et al found that the preexisting disease such

Table 1 - Demographic data of elderly patients with fracture femur.

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>66</td>
<td>101</td>
<td>81.9</td>
</tr>
<tr>
<td>Delay in surgery (hours)</td>
<td>24</td>
<td>280</td>
<td>112</td>
</tr>
<tr>
<td>ASA</td>
<td>1</td>
<td>4</td>
<td>3.31</td>
</tr>
<tr>
<td>Follow up (months)</td>
<td>12</td>
<td>84</td>
<td>32.77</td>
</tr>
</tbody>
</table>

ASA - Anesthesia Society of American Scoring

Table 2 - Mortality of elderly patients related to ASA and type of anesthesia.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Alive (n=35)</th>
<th>Dead (n=13)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>81.88</td>
<td>81.9</td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>Delay in surgery (hours)</td>
<td>134</td>
<td>134</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>ASA</td>
<td>2.73</td>
<td>3.31</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

ASA - Anesthesia Society of American Scoring
as cardiovascular disease and diabetes mellitus was probably them major cause of post-surgical mortality. Our analysis supports this view, the mortality was higher in patients who had existed disease. The treatment of choice is early surgical internal fixation for early mobilization so that the morbidity and mortality could be reduced. There is no general consensus regarding the timing of surgery as proponents and opponents both disagree to agree. Other studies blamed the high mortality in the elderly on the delay of internal fixation.\textsuperscript{28-31} The mortality rate did not increase if the delay of surgery was only >6 hours.\textsuperscript{28,32,33} Recently, Moran et al\textsuperscript{34} reported that delayed surgery for >4 days contribute low mortality rates (30-day mortality [9%]). In this study, our results did not conform with their findings, other factors were also to be considered. In our study, the 30-day mortality was 4\% with a minimum delay of surgery of 5 days. The mortality of the elderly patients with femoral fractures is reported to increase with the time postoperatively. Roberts and Goldacre\textsuperscript{35} after reviewing the British data found that 20-30\% of patients died within the first year of undergoing surgery for hip fracture. In this study, the deaths recorded during the first year were less than 10\%, and this incidence was similar with Roder et al\textsuperscript{36} study (11.7\%). Tomak et al\textsuperscript{38} believed that specifying the type of implant and early postoperative mobilization in patients with femoral fractures could help in decreasing early mortality. In addition, other factor that reduces the mortality in elderly patients is the postoperative rehabilitation. Holmberg et al\textsuperscript{40} initially pointed out that patients will benefit in home rehabilitation after hip fracture. Kusima\textsuperscript{40} showed that rehabilitation at home is better than conventional institution-based rehabilitation. This is probably one of the factor that reduces mortality in our patients, as people in Saudi Arabia believe that it is religiously condemnable for the children to bring their elderly parents in the nursing homes instead of taking care of themselves at home (Aba Al-Kheif\textsuperscript{40}). Marottoli et al\textsuperscript{41} observed that there is a decline in physical function following hip fracture, which results to high risk of institutionalization and early death. The degree of functional recovery after hip fractures are single most important concern for the patient and family alike. One is afraid of the decline in the mobility with more complications of prolonged decubitus. In our patients, we found that 87.5\% of the patients returned to their pre-trauma activity, which made them mobile and perform the routine of life.

In summary, the early mortality of fracture femur in elderly were found to be lower than that reported in the literature. We believe that surgical delay had no significant effect on the mortality rate in the elderly population. There are multiple factors that need to be considered such as ASA, type of anesthesia and postoperative rehabilitation.

References

Mortality, timing of surgery and fracture femur in elderly ... Al-Omran & Sadat-Ali

40. Aba Al-Kheil R. The development of a model for a socio-medical facility for elderly people of Saudi Arabia (Dissertation), Boston University, Massachusetts, Boston, 1988.