

# Retrospective Assessment of Mortality in Geriatric Patients Undergoing Hip Fractures

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## ABSTRACT

**Background:** Hip fracture is a common, possibly destroying event for geriatric patients with around 1.6 million hip fractures happening each year worldwide and an expected 6.2 million hip fractures each year by the year 2050. The present study was planned for retrospective assessment of mortality in geriatric patients undergoing hip fractures.

**Materials and Methods:** A total of 30 patients were selected for the study out of which 74% (22 patients) were females. The mean age of patients was  $76.4 \pm 12.12$  years ranging from 60-100 years. For patient's characteristics, like age, gender, smoking status, body mass index (BMI) and fracture characters, we reviewed operative records and charts.

**Results:** The mean age of patients was  $76.4 \pm 12.12$  years ranging from 60-100 years. We observed that, delay to surgery was not an independent predictor for mortality. The mortality rate of the patients following surgery of hip fracture was observed to be 47%. 7% of the total died within 30 days of the surgery, 10 % died within 6 months of the surgery and 17% died within 1 year of surgery.

**Conclusion:** From the results of present study, we conclude

that with increasing age the risk of morbidity and mortality increases significantly and there is a high rate of mortality in geriatric patients with hip fractures. The delay from admission to surgery was not an independent predictor for mortality.

**Keywords:** Geriatric, Hip fracture, Mortality.

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## INTRODUCTION

Hip fracture is a common, possibly destroying event for geriatric patients with around 1.6 million hip fractures happening each year worldwide and an expected 6.2 million hip fractures each year by the year 2050.<sup>1</sup> There is exponential increase in its occurrence after the age of 70 years, and in the coming time due to increasing population the number will definitely increase.<sup>2,3</sup> Studies have reported that there is a high association of high mortality rate with the cases of hip fractures especially geriatric patients.<sup>4,5</sup> A higher mortality has been associated with increasing age and male gender.<sup>6</sup> Death during the first year after hip fracture may be influenced by the type of hospital in which patients are treated as well as the time spent awaiting surgery.<sup>7,8</sup> So, the present study was planned for assessment of mortality in geriatric patients undergoing hip fractures.

## MATERIALS AND METHODS

The study was conducted in the Department of Orthopedics, Shri Shankaracharya Institute of Medical Science, Bhilai, Chhattisgarh (India). Ethical approval for the study was taken from institutional ethical committee.

### Inclusion criteria

1. Patients aged 60 years or more
2. Etiology of injury being fall from a standing height

The patients with pathological fractures were excluded from the study. A total of 30 patients were selected for the study out of which 74% (22 patients) were females. The mean age of patients was  $76.4 \pm 12.12$  years ranging from 60-100 years. For patient's characteristics, like age, gender, smoking status, body mass index (BMI) and fracture characters, we reviewed operative records and

charts. For fracture classification, radiographs of the femur and knee were reviewed. Also, the time between admission to hospital and surgery were recorded. Time between admission and surgery was recorded. Patient's records were also reviewed for the calculation of Charlson Comorbidity Index (CCI) and age-adjusted CCI at the time of injury. All the results were compiled and recorded by SPSS software. Chi-square test and student t test were used for the assessment of level of significance. P-value of less than 0.05 was taken as significant.

**RESULTS**

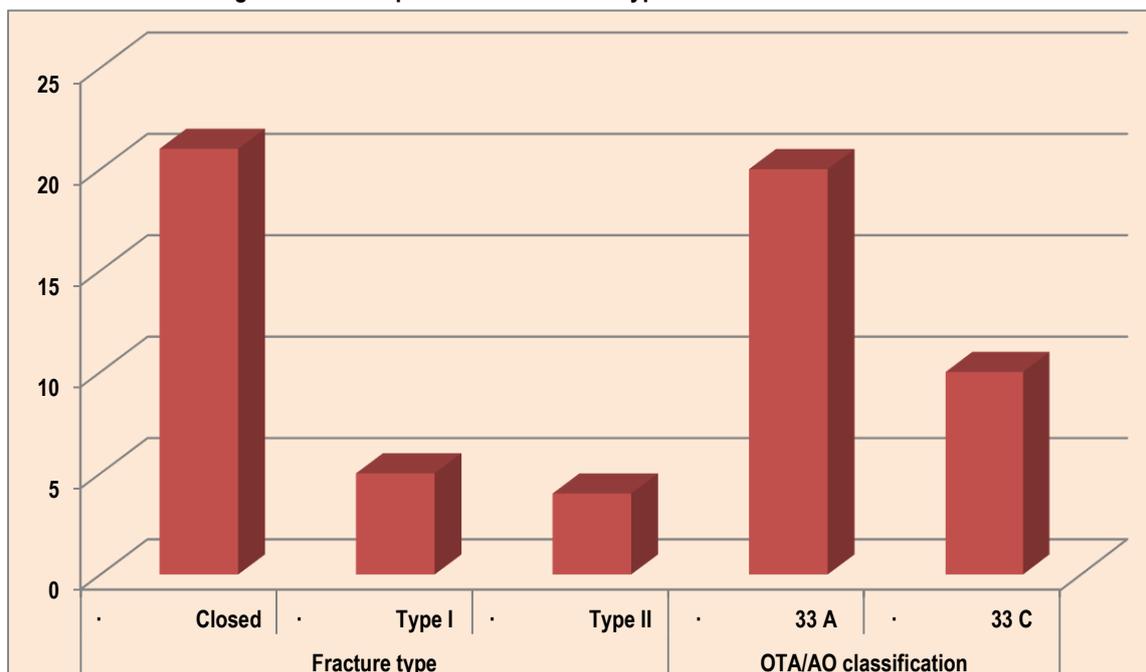
Table 1 shows various variables related to the subjects. We retrospectively reviewed 30 patients for the study. Out of 30 patients, 22 were females (74%) and 8 were males (26%). 4 patients (13%) were smoker. The mean Charlson Comorbidity Index of the subjects was  $2.1 \pm 1.7$  ranging from 0-9. The mean

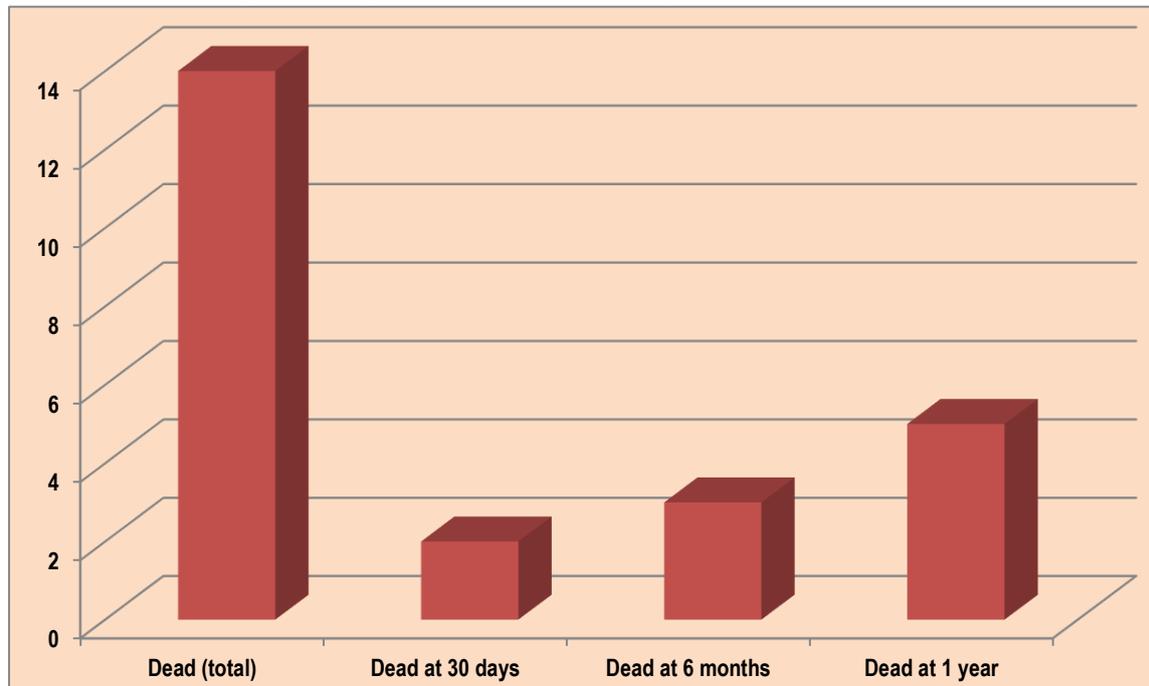
Charlson Comorbidity Index adjusted according to age was  $6.2 \pm 3.1$  ranging from 2-13. The mean age of patients was  $76.4 \pm 12.12$  years ranging from 60-100 years. We observed that, delay to surgery was not an independent predictor for mortality. The types of fractures were closed, Type I and type II. 21 patients (70%) reported with closed fractures, 5 patients (17%) were Type I fractures and 4 patients (13%) were Type II fractures. In the present study, we observed that patients with OTA/AO classification having 33A grade and 33C grade were predictable for mortality rate and were statistically significant ( $P < 0.001$ ). The mortality rate of the patients following surgery of hip fracture was observed to be 47%. 7% of the total died within 30 days of the surgery, 10 % died within 6 months of the surgery and 17% died within 1 year of surgery. The mean time from surgery to death was  $22.3 \pm 12.4$  months. All these results were statistically non-significant ( $P > 0.05$ ).

**Table 1: Various demographics for selected patients**

Variables	Total (n=30)	P-value
Gender (female)	22 (74%)	>0.05
Smoker	4 (13%)	>0.05
Charlson Comorbidity Index	$2.1 \pm 1.7$ (0-9)	>0.05
Charlson Comorbidity Index (age adjusted)	$6.2 \pm 3.1$ (2-13)	>0.05
Mean Age (years)	$76.4 \pm 12.12$ (60-100)	>0.05
Body mass index (kg/m2)*	$29.2 \pm 11.34$ (17.9–54.8)	>0.05
Fracture type	Closed	21 (70%)
	Type I	5 (17%)
	Type II	4 (13%)
OTA/AO classification	33 A	20 (67%)
	33 C	10 (33%)
Time from admission to surgery (days)	$3.6 \pm 2.6$	>0.05
Dead (total)	14 (47%)	>0.05
Dead at 30 days	2 (7%)	>0.05
Dead at 6 months	3 (10%)	>0.05
Dead at 1 year	5 (17%)	>0.05
Time from surgery to death (months)	$22.3 \pm 12.4$	>0.05

**Fig 1: Number of patients with fracture type and OTA/AO classification**



**Fig 2: Mortality rate of patients (total, 30 days, 3 months and 6 months)**

## DISCUSSION

Hip fracture patients commonly have co-morbidities on admission that may influence their management and prognosis. The goal for treatment must be to attend to their operative care rapidly if the patient is to have the best chance of a return to a reasonable quality of life. In the present study, we assessed mortality in elderly patients with hip fractures and determined variables influencing survivorship and evaluated importance of surgical delay on mortality. We observed that the mortality rate totally was 47%. The number of dead patients at 30 days, 6 months and 1 year was 2, 3 and 5 respectively. Le-Wendling L<sup>9</sup> conducted a retrospective cohort review examining the effects of regional anesthesia (from mainly after July 2007) versus general anesthesia (mainly prior to July 2007) on morbidity, mortality and hospitalization costs. This retrospective cohort study involved data collection from electronic and paper charts of 308 patients who underwent surgery for hip fracture from September 2006 to December 2008. Data on postoperative morbidity, in-patient mortality, and cost of hospitalization (as estimated from data on hospital charges) were collected and analyzed. Seventy-three patients received regional anesthesia and 235 patients received general anesthesia. During July 2007, approximately halfway through the study period, a regional anesthesia and analgesia program was introduced. The average cost of hospitalization in patients who receive surgery for hip fracture was no different between patients who receive regional or general anesthesia (\$16,789 + 631 v. \$16,815 + 643, respectively,  $p = 0.9557$ ). Delay in surgery and intensive care unit admission resulted in significantly higher hospitalization costs. Age, male gender, African-American race and intensive care unit admission were associated with increased in-hospital mortality. In-hospital mortality and rates of readmission are not statistically different between the two anesthesia groups. It was concluded that there is no difference in postoperative morbidity, rates of re-hospitalization, in-patient mortality or hospitalization costs in geriatric patients undergoing regional or general anesthesia for

repair of hip fracture. Delay in surgery beyond 3 days and intensive care unit admission both increase cost of hospitalization. Myers AH et al<sup>10</sup> conducted a study in which factors associated with mortality were examined for 27,370 hip fracture patients aged 65 years or older in Maryland hospitals, using discharge data for 1979-1988. Variables of interest included sociodemography, principal medical and injury diagnoses, E-code, year, disposition, and hospital. For both white males and white females, the hip fracture rate doubled with each 5-year increment in age. The overall proportion who died during hospitalization was 4.9% ( $n = 1,339$ ). After multivariate adjustment, there remained a substantially increased risk of death for males. The relative odds (RO) of dying for males versus females were 1.6. Other factors associated with high relative odds of dying during hospitalization included the diagnosis of septicemia (RO = 12.3), pneumonia/influenza (RO = 4.9), and digestive system disorder (RO = 3.6). The RO of dying doubled in the presence of cardiac, neoplastic, or cerebrovascular disease. Patients with diagnoses of nervous system or mental disorder, hypertension, anemia, musculoskeletal system disease, or urinary tract infection were at decreased risk of dying. Results of the study suggested that the prevention or early diagnosis and treatment of serious infections in the elderly patient with a hip fracture remain an important challenge to clinicians.

Weller et al<sup>11</sup> studied 57,315 hip fracture patients who were admitted to hospital in Ontario, Canada. Patients treated in teaching hospitals had a decreased risk of in-hospital mortality (odds ratio (OR) 0.89; 95% confidence interval (CI) 0.83 to 0.97) compared with those treated in urban community institutions. There was a trend toward increased mortality in rural rather than urban community hospitals. In-hospital mortality increased as the surgical delay increased (OR 1.13; 95% CI 1.10 to 1.16) for a one-day delay and higher (OR 1.60; 95% CI 1.42 to 1.80) for delays of more than two days. This relationship was strongest for patients younger than 70 years of age and with no comorbidities but was

independent of hospital status. Similar relationships were seen at three months and one year after surgery. This suggested that any delay to surgery for non-medical reasons is detrimental to a patient's outcome. Zuckerman JD et al prospectively studied 367 patients who had a fracture of the hip, to determine the effect of an operative delay on postoperative complications and on the one-year mortality rate. All of the patients were at least sixty-five years old, cognitively intact, living at home, and able to walk before the fracture. An operative delay was defined as an interval of three calendar days or more between the time of admission to the hospital and the operation. The operation was performed within two calendar days after admission in 267 (73 per cent) of the patients. When the factors of the patient's age and sex and the number of pre-existing medical conditions were controlled, it was found that an operative delay beyond this period approximately doubled the risk of the patient dying before the end of the first postoperative year. When the patient's age and sex and the severity of pre-existing medical conditions were controlled, there was also an increase in mortality associated with an operative delay, although this was not significant. With the numbers studied, an operative delay beyond two calendar days did not have a significant effect on the prevalence of complications during hospitalization. The study concluded that an operative delay of more than two calendar days after admission is an important predictor of mortality within one year for elderly patients who have a fracture of the hip and who are cognitively intact, able to walk, and living at home before the fracture. Optimally, such patients should have the operation within two calendar days after admission to the hospital.<sup>12</sup>

## CONCLUSION

From the results of present study, we conclude that with increasing age the risk of morbidity and mortality increases significantly and there is a high rate of mortality in geriatric patients with hip fractures. The delay from admission to surgery was not an independent predictor for mortality.

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