

# Advanced Age and Operative Delay Leading to Development of Pressure Sores have Significant Impact on Peri-operative Mortality in Trochanteric Fractures

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## Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

## Article Information

### Editor(s):

(1) Dr. Parth Trivedi, Civil Hospital Campus, India.

### Reviewers:

(1) Shrihari L Kulkarni, Shri Dharmasthala Manjunatheshwara University, India.

(2) Mehmet Fatih Korkmaz, Istanbul Medeniyet University, Turkey.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/72950>

Original Research Article

Received 20 June 2021  
Accepted 31 August 2021  
Published 04 September 2021

## ABSTRACT

**Background:** In elderly, trochanteric fractures are frequent and typically result from mild to moderate trauma in osteoporotic bones. Early fracture fixation and mobilization of these patients significantly decreases the risk of pressure sores and hence mortality also.

**Methods:** The present study was conducted in elderly patients with trochanteric fractures (age 60 years and above) presenting to the department of orthopedics, Dr. RPGMC Kangra at Tanda. All cases presenting to the department and fulfilling the inclusion criteria were studied for three months period from the day of surgery. All cases fulfilling the inclusion criteria who were operated over the period of one year from the date of start of study were included.

**Results:** Our study observed that out of 176 patients, bed sore was present in 15 patients. Out of which 2 patients could not survive.

**Conclusions:** In our study, peri-operative mortality among patients with bed sore was influenced by delayed presentation to hospital, and hence delayed fracture fixation and mobilization of these patients.

*Keywords: Elderly; trochanteric fracture; mortality; bed sore.*

## 1. INTRODUCTION

Perioperative mortality is defined as the time interval from the day of surgery to three months post-operatively.

Hip fractures remain a persistent cause of excessive morbidity, reduced life quality and premature mortality among elderly [1]. Advanced age and associated comorbidities are two decisive factors of mortality secondary to trochanteric fracture. This is mainly because elderly people are unable to dissipate energy as compared to the young person and diminished ambulatory speed. Their protective responses are also diminished because of slow reaction time, weakness, disorientation and the side effect of medication [2].

These patients are the frailest among those who are admitted to hospital, and their outcomes are likely to depend closely on how their care is managed [3].

Hip fractures are common and serious: they always cause short-term pain, disability and can lead to longer-term pain, disability and even deformity. Mortality rate is estimated to be 5–10% at one month and 12–27% at one year from surgery [4].

In this study, we determine peri-operative mortality in trochanteric fractures in elderly patients (60 years and above) presented with pressure sores on admission in department of orthopaedics at DRPGMC Tanda.

## 2. METHODS

Study design was hospital based prospective study. Sample technique used was simple random sampling and sample size included all patients reported during study duration.

All cases presenting to the department and fulfilling the inclusion criteria were studied for

three months period from the day of surgery. All cases fulfilling the inclusion criteria who were operated over the period of one year (June 2018 to July 2019) from the date of start of study were included.

## 2.1 Statistical Analysis

The data were presented as frequency, percentages, mean  $\pm$  SD, median and inter quartile range wherever applicable. Normally it of distribution was evaluated using Shapiro-Wilk test. Student t test was used to compare continuous variables with normal distribution. Chi-square test was used using categorical variables. Skewed data between 2 groups were compared using Mann Whitney U test. P value  $<$  0.05 was considered significant. Statistical analysis was performed using SPSS v21.

## 3. RESULTS

A total of 176 patients with trochanteric fractures were included in the study. Results of the study have been described below.

Our study observed that out of 176 patients, 10.23% (n=18/176) patients could not survive within 90 days of surgery, while 89.77% (n=158/176) patients survived.

Our study observed that mean age of group A patients was  $85.44 \pm 7.86$  years and group B patients was  $74.65 \pm 9.56$  years.

Our study observed that among group A patients, bed sore was present in 2 patients (Fig. 1, Fig. 2) and absent in 16 patients. Out of 158 survived patients, bed sore was present in 13 patients.

Patients who underwent early surgery and mobilization had significant advantage of healing of pressure sores and hence lower incidence of peri-operative mortality also.

**Table 1. Perioperative mortality (n = 176)**

Perioperative Mortality	Frequency	Percent
Yes (Group A)	18	10.2
No (Group B)	158	89.8
Total	176	100.0

**Table 2. Age**

		Group A (n=18)	Group B (n=158)	P Value
Age (Years)	Mean±SD	85.44±7.86	74.65±9.56	<0.0001#*
	Median	89.0	75.0	
	IQR	79.75, 90.0	65.0, 82.0	

**Table 3. Bed sore**

Bed Sore	Group A (n=18)	Group B (n=158)	P Value
Yes	2	13	1.000
No	16	145	



**Fig. 1. Pt having bed sore on sacral region**



**Fig. 2. Patient having bed sore in trochanteric region due to delayed presentation to hospital**

#### 4. DISCUSSION

The present study was conducted in patients with trochanteric fractures (age 60 years and above) presenting to the Department of Orthopaedics, Dr. RPGMC Kangra at Tanda.

Excess mortality after hip fracture may be linked to complications following the fracture, such as pulmonary embolism, infections, pressure sore and heart failure. Although several studies report excess mortality in hip fracture patients compared to controls [5] the issue remains under-recognized in many countries like India. Furthermore, peri-operative mortality after hip fracture has not been extensively investigated in India [6].

Moja et al. [3] described in a meta-analysis that a delay to surgery was associated with a significant increase in the risk of death and pressure sores,

and recommended that most patients with a hip fracture should be operated within 1 or 2 days. In addition, early fracture fixation and mobilization of these patients decreases the economic burden as it might reduce the overall length of stay, and thus the total cost [7]. In our study, time from injury to surgery was statistically not significant in the patients who did not survive.

On the contrary, a recent prospective cohort study from Lizaur-Utrilla et al. [8]. 2018 including 1234 patients who underwent hip fracture surgery suggested that waiting time for the surgery more than 2 days to stabilize patients with active comorbidities at admission was not associated with higher complication or mortality rate. However, the patients who were delayed to surgery due to organizational reasons had a significant higher rate of postoperative complications and 1-year mortality.

In the last decade efforts have been made to boost our knowledge of the prognostic factors influencing the course and management of hip fracture. As the majority are treated surgically, time to surgery may be decisive. Some studies report that pre-operative delay might lead to an increase in mortality and adversely influence other clinical outcomes such as infection and pressure sores [9-12].

Pressure sores are very notorious in a case of hip fracture. First, because the patient is already bed ridden this event leads to a vicious cycle. Secondly, because of subsequent infection and foul smell it becomes a major concern for the care takers.

In all hip fractures before and after surgery active / passive side turning of the patient should be encouraged and concerned consultant should teach his staff and residents regarding the same. In case of high obese patients or in patients where delay in surgery is anticipated air mattresses should be used.

Early hip fracture surgery does appear to provide a survival benefit in comparison with later intervention; it was also associated with a significant reduction in pressure sores. Conservative timing strategies should be limited to patients who will benefit most (i.e. those requiring stabilization) because, besides consuming considerable resources, and physician and nursing time, they may severely affect a patient's health. Cardiac or renal failure is a compelling reason for delay: cardiologists or nephrologists are consulted to set the timing for surgery, and patients often require additional treatments and tests that take time. This unavoidable delay keeps the patient in bed, increasing the risk of pulmonary, skin and urinary infections and may erode the benefit brought by the specialist approach. Whenever possible the consultation should be completed in 24–48 hours. Administrative delays are unjustifiable. The early surgery strategy is not intended as a race against time to operate patients in a few hours but everything possible should be done to ensure the majority of patients are operated within one to two days [3].

## 5. CONCLUSION

In our study, peri-operative mortality is lower than reported earlier studies. We also found that perioperative mortality was influenced by older

age and delayed mobilization of these patients. This warrants better peri-operative care of these patients to avoid development of pressure sores and severity of other comorbidities by early fracture fixation and mobilization within one or two days since injury.

## LIMITATIONS

Limitations of the study were less time duration and study were single center study.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL CONSIDERATION

The study was initiated following approval from institutional ethics committee (IEC). The patients were given the right to abstain from participation in the study or to withdraw at any time of the study without reprisal. Inclusion criteria included all patients of trochanteric fracture 60 years and above, all patients meeting the exclusion criteria were excluded from the study.

Exclusion criteria excluded concomitant trauma involving other systems, associated fracture of the pelvis, bilateral hip fracture, pathological fracture and did not give consent to participate in the study.

After a detailed history, patients were clinically evaluated at the time of admission. The demographic data of the patients such as age, sex, pre-existing co-morbidities, bed sores, type of fracture and degree of osteoporosis were recorded.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Marks R. Physical activity and hip fracture disability: a review. *J Aging Res.* 2011;3:1-7.
2. Babhulkar S. Management of trochanteric Fractures. *Indian J Orthop.* 2006;40:210-18.

3. Moja L, Piatti A, Pecoraro V, Ricci C, Virgili G, Salanti G, et al. Timing matters in hip fracture surgery: patients operated within 48 hours have better outcomes. A meta-analysis and meta-regression of over 190,000 patients. *PLoS One*. 2012;7:e46175.
4. Parker M, Johansen A. Hip fracture. *Bmj*. 2006;333:27–30.
5. Zhao F, Wang X, Dou Y, Wang H, Zhang Y. Analysis of risk factors for perioperative mortality in elderly patients with intertrochanteric fracture. *Eur J Orthop Surg Traumatol*. 2019;29:59-63.
6. Åhman R, Siverhall PF, Snygg J, Fredrikson M, Enlund G, Björnström K, Chew MS. Determinants of mortality after hip fracture surgery in Sweden: a registry-based retrospective cohort study. *Sci Rep*. 2018;8:15695.
7. Siegmeth AW, Gurusamy K, Parker MJ. Delay to surgery prolongs hospital stay in patients with fractures of the proximal femur. *J Bone Joint Surg Br*. 2005;87:1123–6.
8. Lizaur-Utrilla A, Gonzalez-Navarro B, Vizcaya-Moreno MF, Miralles Munoz FA, Gonzalez-Parreno S, Lopez-Prats FA. Reasons for delaying surgery following hip fractures and its impact on one year mortality. *Int Orthop*. 2019;49:441-8.
9. Weller I, Wai EK, Jaglal S, Kreder HJ. The effect of hospital type and surgical delay on mortality after surgery for hip fracture. *Journal of Bone & Joint Surgery – British*. 2005;87:361–366.
10. Novack V, Jotkowitz A, Etzion O, Porath A. Does delay in surgery after hip fracture lead to worse outcomes? A multicenter survey. *International Journal for Quality in Health Care*. 2007;19:170–176.
11. Bottle A, Aylin P. Mortality associated with delay in operation after hip fracture: observational study. *Bmj*. 2006;332:947–951.
12. Gdalevich M, Cohen D, Yosef D, Tauber C. Morbidity and mortality after hip fracture: the impact of operative delay. *Archives of Orthopaedic & Trauma Surgery*. 2004;124:334–340.

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*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/72950>