

Elevated Preoperative Troponin Levels Are Associated with Large Increases in Mortality and Major Adverse Events in Geriatric Distal Femur Fracture Patients

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Purpose: Elevated preoperative troponin levels have been reported in 10% to 14% of geriatric hip fracture patients and are associated with increased mortality and adverse events. The utility of preoperative troponin levels as a risk stratification tool in other geriatric fracture patients has not been explored. In this study, we evaluated if elevated preoperative troponin were associated with increased 90-day mortality or major adverse events in geriatric patients with an operatively treated distal femur fracture. Secondarily, we assessed if elevated troponin levels were associated with delays to surgery and increased hospital length of stay.

Methods: We performed a retrospective cohort study. We included patients over the age of 60 years with a distal femur fracture treated operatively at a single Level I trauma center from 2015 to 2022. The primary exposure was an elevated preoperative troponin level. Our primary study outcome was composite 90-day mortality and major postoperative adverse events, which include myocardial infarction, stroke, venous thromboembolic event, and pneumonia. Multivariable logistic regression was performed to estimate the association between elevated preoperative troponin levels and the primary outcome.

Results: The study included 295 geriatric distal femur fracture patients with a median age of 73 years (interquartile range [IQR] 66-88). Elevated preoperative troponin levels were present in 11.5% (n = 34) of patients. Mortality was significantly greater in the elevated troponin group at 20.6% (n = 7) compared to 6.1% (n = 16) in patients with normal troponin levels (risk difference 14.5%; 95% confidence interval [CI] 0.6-28.4%; P = 0.009) (Table 1). Adverse events at 90 days in the elevated troponin group was 41.2% compared to 10.3% in normal troponin cohort (risk difference: 30.9%; 95% CI 13.9-37.9; P<0.001). After controlling for American Society of Anesthesiologists (ASA) score and pre-injury living status, elevated preoperative troponin levels were still associated with a significant increase in mortality and adverse events at 90 days (adjusted odds ratio [aOR] 4.8; 95% CI 2.1-11.3; P = 0.0002). Elevated troponin levels were also associated with a significant increase in median time to surgery (31.8 vs 20.9 h, P = 0.002) and median length of stay (10.6 vs 6.5 days, P<0.001).

Conclusion: Elevated preoperative troponin is associated with a large (aOR 11.1, P<0.001) increase in mortality and major adverse events after fixation of distal femur fractures. This population may be a good target for interventions aimed at reducing perioperative complications.

Outcome	Elevated Troponin	Normal Troponin	Difference 95% CI	P value
Mortality within 90 days	7 (20.6%)	16 (6.1%)	14.5 (0.6 – 28.4)	0.009
Major Complication within 90 days	29 (85.2%)	99 (37.9%)	47.3 (36.4-61.1)	<0.001
Time from injury to surgery (hours), median (IQR)	31.8 (20.8-53.4)	20.9 (12.3-34.3)	10.9 (3.9-17.9)	0.002
Length of stay (days), median (IQR)	10.6 (6.5-21.0)	6.5 (4.7-10.0)	4.1 (1.8-12.1)	<0.001

Table 1. Association Between Elevated Troponin and Study Outcomes

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