

The Influence of Optimal Reduction on Mortality in Extracapsular Hip Fractures: An Analysis of 620 Patients

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Purpose: Several studies suggest that achieving optimal postoperative reduction not only reduces the likelihood of reoperation but also significantly impacts long-term survival outcomes. The primary aim of this study is to analyze the effect of reduction quality on 1-year mortality. Specific objectives include classifying reduction based on Chang's criteria, comparing 1-year and 30-day mortality rates post-surgery, assessing functional changes 1 year after surgery, and evaluating surgical times.

Methods: We conducted a retrospective analysis using a prospective database from our institutional hip fracture registry. The study included patients who sustained pertrochanteric fractures and underwent surgical intervention between October 2020 and June 2023. Chang's classification and the date of death or last follow up were retrospectively added to the database for analysis. To assess the causal association between reduction quality and survival within 1 year, we applied a Cox regression model adjusted for propensity scores using Inverse Probability Weighting (IPTW). We also assessed 30-day mortality using the same regression model. Functional outcomes were evaluated using the New Mobility Score (NMS) and were stratified by reduction quality. Finally, the relationship between surgical time and reduction quality was analyzed using logistic regression adjusted by IPTW.

Results: A total of 620 patients with pertrochanteric fractures treated with an intramedullary nail was included. The 30-day mortality rate was 4.68%, and the 1-year mortality rate was 24.6%. Patients with “excellent” reduction according to Chang’s criteria had lower mortality, with an unadjusted hazard ratio (HR) of 0.52 (95% CI: 0.4–0.68) and an adjusted HR using IPTW of 0.6 (95% CI: 0.45–0.8). In patients with “acceptable” reduction, the median decline in NMS was –1 [IQR 0, –3], while in patients with “excellent” reduction, the median decline was 0 [IQR 0, –2]; however, this difference was not statistically significant ($p = 0.4$). We also found that patients with “acceptable” reduction had a longer median surgical time compared to those with “excellent” reduction.

Conclusion: Our findings suggest an association between postoperative reduction quality and 1-year mortality. Surgeons treating these fractures should aim for optimal reduction to improve patient outcomes.