Two Big Bones, One Big Decision: When to Fix Bilateral Femur Fractures

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Purpose: For polytrauma patients with bilateral femoral shaft fractures (BFSFs), there is currently no consensus on the optimal timing of surgery. This study assesses the impact of early (≤24 hours) versus delayed (>24 hours) definitive fixation on clinical outcomes, especially focusing on concomitant versus staged repair. We hypothesized that early definitive fixation leads to lower mortality and morbidity rates.

Methods: The 2017-2020 Trauma Quality Improvement Program was used to identify patients aged ≥16 years with BFSFs who underwent definitive fixation. Early definitive fixation (EDF) was defined as fixation of both femoral shaft fractures within 24 hours, delayed definitive fixation (DDF) as fixation of both fractures after 24 hours, and early staged fixation (ESF) as fixation of 1 femur within 24 hours and the other femur after 24 hours. Propensity score matching and multilevel mixed effects regression models were used to compare groups.

Results: 1118 patients were included, of whom 62.8% underwent EDF. Following propensity score matching, 279 balanced pairs were formed. EDF was associated with decreased overall morbidity (12.9% vs 22.6%, P = 0.003), lower rate of deep venous thrombosis (2.2% vs 6.5%, P = 0.012), a shorter ICU length of stay (LOS) (5 vs 7 days, P<0.001) and a shorter hospital LOS (10 vs 15 days, P<0.001). When compared to DDF, ESF was associated with lower rates of ventilator acquired pneumonia (0.0% vs 4.9%, P = 0.007), but a longer ICU LOS (8 vs 6 days, P = 0.004). Using regression analysis, every 24-hour delay in time to definitive fixation increased the odds of developing complications by 1.05, postoperative LOS by 10 hours, and total hospital LOS by 27 hours.

Conclusion: Early definitive fixation (≤24 hours) is preferred over delayed definitive fixation (>24 hours) for patients with bilateral femur shaft fractures when accounting for age, sex, injury characteristics, additional fractures and interventions, and hospital level. Although mortality does not differ, overall morbidity and deep venous thrombosis rates, and length of hospital and ICU stay are significantly lower. When early definitive fixation is not possible, early staged repair seems preferable over delayed definitive fixation.