Delay in Flap Coverage for Open Tibia Fractures Increases Inpatient Complications: A Cohort Study of 140 North American Trauma Centers

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Purpose: This study was conducted to measure time to flap coverage after open tibia fractures and assess whether delays are associated with inpatient complications.

Methods: Data were derived from participating Trauma Quality Improvement Program (TQIP) centers between 2012 and 2015. Adults undergoing surgery for (1) an open tibia fracture and (2) a soft-tissue flap were eligible. The primary exposure was time from hospital arrival to definitive flap coverage (in days). The primary outcome was a composite of the following complications during the index admission: deep infection, osteomyelitis, and/or amputation. The primary analysis compared early and delayed coverage groups (≤7 and >7 days, respectively) after matching on propensity scores. We also modeled time to flap coverage as a continuous variable with logistic regression and cubic splines.

Results: There were 672 patients at 140 centers included, of which 412 (61.3%) received delayed coverage (>7 days). After matching, delayed coverage was associated with a significant increase in complications (16.7% vs 6.2%, P <0.001, NNH [number needed to harm] = 10). The duration of delay was also associated with an increasing risk (adjusted odds ratio [OR] 1.45, 95% confidence interval [CI] 1.27 - 1.66, per week coverage was delayed, P <0.001).

Conclusion: This is the first multicenter study of flap coverage for open tibia fractures. Complications rose significantly when flap coverage was delayed beyond 7 days, consistent with current guideline recommendations. Since the majority of patients did not receive coverage within this time frame, quality improvement initiatives are required.