Delayed Nailing May be Protective Against Infection in Gustilo 3B Tibial Fractures

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Purpose: The interval between IM nailing and flap coverage has been shown to impact the risk of deep infection in Gustilo type III open tibial fractures. We sought to determine if the injury to IM nailing interval altered the impact of the IM nail to flap coverage interval.

Methods: The relative risk of deep infection was predicted with log-binomial stratified multivariable spline models that investigated the effects of: time from injury to IM nail, time from IM nail to flap. Based on prior studies, spline nodes were at two, five, and ten days for injury to nail time.

Results: We evaluated 296 patients (227M), avg age 40.±16. The deep infection rate after flap coverage was 26% (78/296). The infection rates for injury to nail times less than two days, two to five days, and later than five days were 15.9%, 14.4%, and 22.3%, respectively. With longer times from injury to definitive fixation, there was a progressive flattening of the predicted infection rate versus definitive fixation to flap time curves (Figure 1). The odds with each day delay from definitive fixation to flap coverage were OR=1.11 (95% CI 1.03 to 1.20, p=0.01) with injury to fixation times less than two days, OR=1.05 (95% CI 0.97 to 1.14, p=0.23) for those with injury to fixation times from two to five days, and OR=1.03 (95% CI 0.96 to 1.10, p=0.43) for injury to fixation times longer than five days. The mean number of debridements were 2.4 for 0-2 days days, 2.7 for 2- 5 days, and 3.0 (± 0.68) for > 5 day groups which may contribute to a cleaner bed.

Conclusion: Delays in nailing may be protective against infection in type 3B open tibia fractures when controlling for the definitive fixation to flap time. More débridements were performed in when nailing was delayed.