

Is the OTA Open Fracture Classification (OTA-OFC) Better Than the Gustilo-Anderson Classification at Predicting Fracture-Related Infections?

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Purpose: The Gustilo-Anderson (GA) classification is commonly used to grade open fracture severity and is correlated with increased infection risk. The recently developed OTA Open Fracture Classification (OTA-OFC) includes 5 domains (skin, muscle, arterial, contamination, and bone loss) and aims for a more comprehensive injury severity description. It is unknown whether the increased complexity of the OTA-OFC provides additional prognostic value in determining a patient's infection risk.

Methods: We conducted a retrospective cohort study including patients with an open tibia fracture treated surgically at a single center between 2010 and 2021. The treating surgeons prospectively assigned an OTA-OFC and GA score after the initial debridement. Our primary outcome was a fracture-related infection (FRI) requiring reoperation. Logistic regression models were used to test the association of OTA-OFC and GA with FRI. Likelihood ratio (LR) tests were used to evaluate improved goodness of fit with different GA and OTA-OFC combinations.

Results: Among the 912 operative fractures, 142 (15.6%) had an FRI. GA was a stronger predictor of FRI than any OTA-OFC domain, explaining 72% of FRI variance. Adding OTA-OFC contamination with GA explained 84% of FRI variance and significantly improved model fit (LR test, $P = 0.04$). Embedded contamination in these wounds increased FRI risk by 8% for GA type I or II, 11% for type IIIA, 11% for type IIIB, and 9% for type IIIC.

Conclusion: In contrast to prior studies, we found that the more complex OTA-OFC system was inferior to GA in predicting FRIs in patients with open tibia fractures. This discrepancy may be due to higher quality data from prospectively classifying the wounds versus prior studies that utilized retrospective reviews of non-standardized operative reports. However, adding embedded wound contamination to the GA classification system does improve its prognostic ability.