

What Predicts Change in Preoperative to Intraoperative Gustilo Anderson Classification Grade for Open Fractures?

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Purpose: The Gustilo Anderson (GA) classification is a validated assessment tool used to evaluate the severity of an open fracture wound. While the original intent of the GA classification was to be used post debridement, many surgeons use it both preoperatively and intraoperatively. However, it is known that the postoperative classification can be different than the preoperative. Among patients enrolled in a previous trial, we set out to determine what factors may change the initial GA assessment in order to help better predict the postoperative classification and subsequent treatment.

Methods: All patients enrolled in the trial had a GA grade assigned both preoperatively and intraoperatively by their treating surgeon. We determined how frequently the initial GA grade was upgraded or downgraded intraoperatively using descriptive statistics. We then performed a logistic regression with absolute change in preoperative to intraoperative score as the dependent variable. Length of wound, width of wound, bone loss, preoperative GA grade, location of fracture, mechanism of injury, preoperative skin loss, and preoperative muscle loss were included as independent variables in our analysis. Results were presented as odds ratios (ORs), 95% confidence intervals (CIs), and P values. All tests were 2-tailed with $\alpha = 0.05$.

Results: A total of 2415 participants enrolled in the trial were included in our analysis. 315 patients (13.0%) had GA grade upgraded intraoperatively, while 130 patients (5.3%) had GA grade downgraded. Bone loss (OR 1.58, 95% CI 1.22-2.03; $P < 0.001$), fractures of the tibia (OR 1.41 vs fractures elsewhere, 95% CI 1.13-1.75; $P = 0.002$), and a GA grade of 1 at presentation (OR 1.70 vs GA grade 2, 95% CI 1.23-2.27; $P = 0.001$, and OR 1.79 vs GA grade 3, 95% CI 1.11-2.85; $P = 0.02$) were associated with increased odds of deviance in GA ranking.

Conclusion: Our results suggest that a large proportion of open fractures are assigned an incorrect GA grade preoperatively. In particular, fractures involving any amount of bone loss, of the tibia, or those assigned a lower preoperative GA grade were more likely to have a deviance in GA grade from preoperative to intraoperative assessments. Treatment recommendations based on preoperative assessments should be interpreted with caution while consideration should be made to tailor treatment made on additional factors other than size of wound alone.