

Does the OTA-Open Fracture Classification (OTA-OFC) Predict Flap-Related Complications in Severe Open Tibial Fractures?

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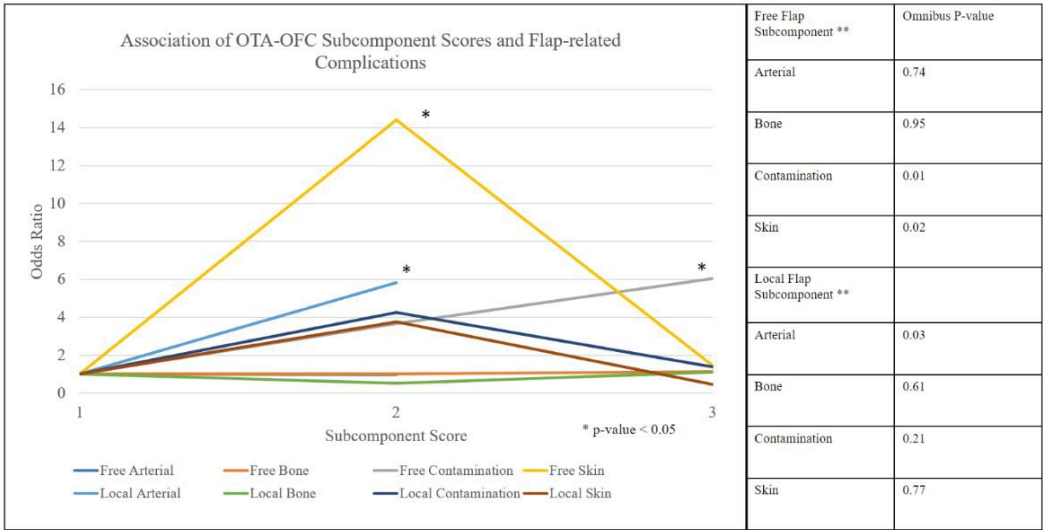
Purpose: It is unknown if the Orthopaedic Trauma Association Open Fracture Classification (OTA-OFC) improves upon the limited ability of the of the Gustilo-Anderson system to adequately describe the range of severity in injuries that require flap coverage. The purpose of this study was to evaluate the ability of the OTA-OFC to predict wound complications in patients with severe open tibial fractures who underwent local and free flap reconstruction. Our hypothesis was that higher OTA-OFC cumulative and subcomponent scores would be associated with increased flap-related complications.

Methods: This is a secondary analysis of data collected in FIXIT, a multicenter prospective trial comparing outcomes following internal fixation versus modern ring external fixators in patients with severe open tibial fractures. The study population included patients in both the randomized and observational arms who underwent local or free flap reconstruction. The primary outcome was hospital readmission or reoperation for a flap-related complication within 1 year of study enrollment. Logistic regression and omnibus tests were used to determine associations between OTA-OFC cumulative and subcomponent scores with complications.

Results: 258 patients underwent flap reconstruction; 71 patients underwent local flap and 187 underwent free flap reconstruction. Cumulative OTA-OFC averaged 9 points (range, 5–14) for both groups. Within patients treated with free flaps, a 1-point increase in the cumulative OTA-OFC was associated with a 35% increase in the odds of a flap-related complication (95% confidence interval, 1.1-1.6; $P = 0.001$). Within patients treated with local flaps, we observed a similar point estimate of 1.3 per 1-point increase but the association was not statistically significant ($P = 0.15$). Upon omnibus testing, subcomponent scores within skin ($P = 0.02$) and wound contamination ($P = 0.01$) were associated with increased flap-related complications within the free flap group and the arterial subcomponent score within the local flap group ($P = 0.03$).

Conclusion: The OTA-OFC appears to provide clinically useful data to help risk-stratify flap-related complications in patients undergoing flap reconstruction for severe open tibial fractures. Clinicians should be aware that the arterial, skin, and contamination subcomponent scores seem to provide particularly valuable information when predicting odds of flap-related complications in these complex patients.

Figure 1. Association between subcomponent OTA-OFC scores and flap-related complications in patients with free and local flaps. The 1-year rate of wound complications in the free flap cohort was 23%. The 1-year rate of wound complications in the local flap cohort was 17%.



** The muscle component had insufficient variance to produce stable estimates. Similarly, Arterial 3 had insufficient data for a stable estimate.