The Effect of Positive Post-Debridement Cultures on Local Muscle Flap Reconstruction of the Lower Extremity

John Shuck, MD; John Nolan, MD; Arjun Kanuri, MD; Karen K Evans, MD; Christopher E Attinger, MD

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INTRODUCTION: Local muscle flaps are a powerful reconstructive option for wound coverage in the distal lower extremity, particularly in high-risk patients who are poor candidates for free tissue transfer.[1] Positive wound cultures at the time of flap reconstruction has been shown to significantly increased complication rates.[2] At our institution, chronic and infected wounds are managed with serial debridement to negative qualitative wound cultures prior to definitive reconstruction.[3] However, in some cases reconstruction is performed in the setting of positive post-debridement cultures due to recalcitrant infection or delayed culture growth. Aggressive serial debridement provides an optimal wound bed at the cost of multiple return trips to the operating room and increased length of hospital stay. This study investigates the relationship of positive post-debridement cultures on flap closure rates at 90 days.

MATERIALS AND METHODS: A retrospective review of patients undergoing local muscle flap coverage of chronic distal lower extremity wounds between 2006 and 2012 was performed. Prior to flap coverage, all patients were managed with serial debridements with post-debridement wound cultures prior to local muscle flap reconstruction. Data recorded included demographics, flap type/location, culture data, and closure at 90 day follow-up. Statistical analysis was performed via univariate and multivariate linear regression.

RESULTS: Of 76 patients, 60 patients met the inclusion criteria with minimum 90 day follow-up. Flaps performed included flexor digitorum brevis (n=10), abductor digit minimi (n=14), extensor digitorum brevis (n=2), abductor hallucis brevis (n=14), extensor hallucis longus (n=1), gastrocnemius (n=16), and peroneus longus (n=3). 17 patients (28.3%) had failure of complete flap closure and 22 patients (36%) had positive post-debridement cultures. On univariate analysis, positive post-debridement cultures (OR:20.4, CI95%:4.7-88.3, p<0.001), smoking (OR:3.7, CI95%:1.1-12.1, p=0.03), and multi-drug resistant bacteria (OR:3.8, CI95%:1.1-13.2, p=0.03) were significant predictors of failure at 90 days. Multivariate analysis identified only positive post-debridement culture (OR:29.6, CI95%:3.6-246.4, p=0.002) and smoking (OR:8.9, CI95%:1.4-57.6, p=0.02) as independent predictors of non-closure at 90 days. (Table 1.)

CONCLUSION: In this series of local muscle flap coverage of distal lower extremity wounds, positive post-debridement cultures were a strong independent predictor of failure. This may result in the need for further complex reconstruction or amputation and demonstrates the benefit of serial debridement to negative cultures prior to definitive coverage in this patient population.

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FIGURE LEGEND:

Table 1. Multivariate Analysis. Post-Dbt; Post-Debridement; DM, Diabetes Mellitus; PAD, Peripheral Arterial Disease; MDR, Multi-Drug Resistant Organisms