Sufficient data were reported to meta-analyze eight NSQIP-defined complications. Predictive accuracy was poor for medical complications [pulmonary AUC = 0.67 (0.48–0.87), cardiac AUC = 0.66 (0.20–0.99), venous thromboembolism AUC = 0.55 (0.47–0.63)]. Similarly, predictive accuracy for surgical complications was unsatisfactory [surgical site infection AUC = 0.55 (0.46–0.63), reoperation AUC = 0.54 (0.49–0.58), serious complication AUC = 0.58 (0.43–0.73)]. Finally, any complication was poorly predicted by the NSQIP Risk Calculator [AUC = 0.60 (0.57–0.64)]. Although mortality was accurately predicted in two studies [AUC = 0.87 (0.54–0.99)], heterogeneity was high with $I^2 = 68\%$. Otherwise, heterogeneity was minimal ($I^2 < 50\%$) for all other outcomes.

CONCLUSIONS: The NSQIP Universal Surgical Risk Calculator aimed at offering individualized quantifiable risk estimates for surgical complications, consistently demonstrated poor risk discrimination in this plastic surgery-focused meta-analysis. The limitations of the Risk Calculator are perhaps most pronounced where complex, multidisciplinary reconstructions are needed. Future efforts should identify targets for improving Risk Calculator reliability in order to better counsel patients in the perioperative setting and guide appropriate healthcare resource allocation.

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The Effect of Variation in Intraoperative Technique on Outcomes in Lower Extremity Free Flap Reconstruction

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BACKGROUND: Free flap failure rates are higher in the lower extremity than other areas of the body. Although many studies have investigated the effect of particular intraoperative technical variables, these studies include small case series or are not contemporary cohorts, more closely reflecting current practice with wide availability and acceptance of instruments such as venous couplers and perforator flap techniques.

PURPOSE: Investigate the effect of variation in intraoperative techniques and flap selection on flap outcomes in a diverse cohort of patients requiring lower extremity free flap coverage at multiple institutions.

METHODS: Consecutive patients undergoing free flap reconstruction of the lower extremity distal to the hip at two level-1 trauma centers from January 1, 2002 to January 1, 2020 were identified using CPT codes followed by review of electronic medical records to collect patient and treatment characteristics. Data were collected regarding patient demographics and comorbidities, indication for operation, intraoperative technical details (including recipient artery and vein, number of venous anastomoses, superficial or deep venous system, coupler use and coupler size, end-to-end and end-to-side anastomosis techniques, use of vein grafts or AV loops), and complications. The primary outcome of interest was flap failure, and secondary outcomes included unplanned return to the operating room, arterial thrombosis, venous thrombosis, and partial flap failure. Bivariate analysis and multivariable logistic regression were performed.

RESULTS: 410 patients underwent 420 free tissue transfers to the lower extremity distal to the hip. Median follow up time was 17 months (IQR 8.0–37). Overall, total flap failure occurred in 5.0% (n = 21), partial flap failure in 5.7% (n = 24), and unplanned reoperation in 9.0% (n = 37), arterial thrombosis 3.2% (n = 13), and venous thrombosis 5.4% (n = 22). Regarding intraoperative variables, on bivariate analysis, ALT donor site ($P = 0.049$) was associated with arterial thrombosis, ankle recipient site ($P = 0.046$) and prior failed reconstruction ($P = 0.003$) with partial flap failure, and arterial revision with total flap failure ($P = 0.035$). Recipient artery, recipient vein, venous system, number of venous anastomoses, and arterial and venous anastomotic technique were not associated with any of the outcomes. On multivariate analysis, only the relationship between intraoperative arterial revision and total flap failure [OR: 4.54, p 0.016, 95% CI (1.3–16)] and prior failed reconstruction and partial flap failure [OR 2.79, p 0.020, 95% CI (1.2–6.7)] remained significant.
CONCLUSIONS: This retrospective review demonstrates that many options are available to the reconstructive surgeon performing lower extremity reconstruction with free flaps regarding intraoperative technique and flap anatomy that lead to equally high success rates; however, intraoperative revision of the arterial anastomosis portends poorly for ultimate flap success.

Guillotine Amputation Prior to Major Amputation Decreases Infectious Complications and Long-term Amputation Failure in Lower Extremity Chronic Wound Patients

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PURPOSE: Chronic wounds of the lower extremity (LE) are often complicated by infection. Definitive treatment of wounds resistant to conservative management often entails major amputation and/or reconstruction. For severely infected chronic wounds, a guillotine amputation performed before definitive amputation can help control infection and maximize success of subsequent major amputation. A recent study demonstrated that this two-stage approach may decrease short-term complications; however long-term outcomes are yet to be evaluated. This study aims to assess the effect of guillotine amputation on rates of long-term success of major amputation.

METHODS: A retrospective review of all major LE amputations performed between January 2017 and July 2020 at our tertiary wound center was conducted. Major amputation was performed in the setting of chronic and/or infected LE wounds that were not amenable to limb salvage. Patients who were lost to follow up or who expired during the study period, as well as patients undergoing amputation for trauma, chronic pain, a non-infected limb deformity, or cancer, were excluded. Patient characteristics, preoperative labs, and amputation data were collected. Postoperative complications assessed included rates of hematoma, dehiscence, infection, and infection requiring takeback to the operating room. Other outcomes of interest included stump revision, time to complete healing, and amputation failure, which was defined as failure to heal or need for more proximal amputation. Patients were separated into guillotine and no guillotine amputation groups. Statistical analysis was performed to compare patient characteristics and amputation outcomes between groups. Student t-test and Mann-Whitney U-test were used to analyze continuous variable while Chi-square test and Fisher exact test were used to analyze binary variables, as appropriate.

RESULTS: An estimated 193 patients meeting inclusion criteria were identified: 54 did not undergo guillotine amputation; 139 underwent guillotine amputation before definitive major amputation. Demographics, comorbidities, relevant preoperative laboratories, and amputation location were not statistically different between the two groups. Rates of hematoma and dehiscence were similar between groups; however, the guillotine group had significantly decreased rates of infection (7.19% versus 22.22%, P = 0.003), infection requiring takeback to operating room (4.32% versus 20.37%, P < 0.001), stump revision (2.88% versus 10.91%, P = 0.032), and amputation failure (4.32% versus 12.73%, P = 0.035) compared with the no guillotine group. Time to healing for successful amputations (2.76 versus 2.32 months, P = 0.925) and follow-up (15.07 versus 14.33 months, P = 0.445) were similar between groups.

CONCLUSIONS: The results of this study suggest that guillotine amputation prior to definitive major amputation play a significant role in limiting the spread of infection, resulting in decreased infectious complications and improved success rates following major amputation, compared with single-stage major amputations. A two-stage approach is also advantageous in decreasing the need to return to the operating room for infection or stump revision. Guillotine amputations should be considered in the setting of infected chronic lower extremity wounds to improve long-term patient outcomes.

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Ventral Hernia Repair: How Payment Reform Is Changing Paradigms

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