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A national data-driven approach to optimizing monitoring of autologous breast free flap reconstruction: Analysis of 3,666 patients

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Purpose: Multiple studies have revealed that micro-vascular free flap compromise classically occurs within the first 48 postoperative hours. These studies have also suggested that free flap salvage rates after this 48-hour window are significantly low and likely not cost-effective. However, national studies exclusively analyzing the rates of breast free flap compromise within this 48-hour window are lacking. We aimed to determine the rates of breast free flap compromise requiring reoperation during the first 2 postoperative days (PODs). In addition, we aimed to identify the independent predictors for breast free flap reoperation.

Methods: Retrospective review of all females undergoing autologous breast free flap reconstruction from the ACS-NSQIP 2012-2014 prospectively collected data. We determined the ratio of unplanned breast free flap reoperation from the end of surgery until the end of POD1 and subsequently from the end of POD1 to the end of POD2. Additionally, we conducted multivariable logistic regression analysis to determine the independent predictors of unplanned reoperation in the breast free flap population.

Results: A total of 3,666 breast free flap patients were identified. We found that 215 (5.9%) patients required unplanned reoperation within the first 2 days following surgery. Out of the 3,666 patients undergoing breast free flap reconstruction, 174 (4.7%) patients required reoperation between the end of surgery and the end of POD1, while only 41 (1.1%) patients required reoperation during POD2, with reoperation being significantly less likely during POD2 [odds ratio (OR): 0.19, p-value < 0.001, 95% Confidence Interval (CI): 0.13, 0.27]. Multivariable logistic regression revealed that BMI ≥ 40, hypertension, American Society of Anesthesiology (ASA) class ≥ 3, and smoking were independent predictors of unplanned reoperation after breast free flap reconstruction (all $p < 0.05$)

Conclusion: This is the first national study specifically analyzing the timing and independent predictors of breast free flap reoperation. Given the very low rate of breast free flap compromise during POD2 and the significant drop in this rate compared to POD1, we believe that providers should discontinue free flap monitoring by the end of POD1 in patients without the identified predictors for breast free flap reoperation, while it can be extended until POD2 for patients with such risk factors. Future studies should explore if this approach results in significant cost savings, similar outcomes, and heightened patient satisfaction.

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