

Independent Predictors of Readmission in Autologous Breast Reconstruction

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Purpose: The rates of readmission in breast reconstruction have been previously reported, though risk factors for readmission in autologous breast reconstruction have not been thoroughly elucidated. As readmission is a relevant and valid measure of the surgical performance of a hospital, identifying patients at risk of readmission is of utmost importance. This study aims to identify specific independent risk factors for readmission in autologous breast reconstruction.

Methods: This study retrospectively reviewed the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) and identified all patients who underwent autologous breast reconstruction performed between 2011 and 2013. Univariate logistic regression analysis was used to identify significant associations between preoperative risk factors and readmission. Multivariate logistic regression analysis was then used to identify independent risk factors and causes of readmission.

Results: Of the 5,422 female patients identified who underwent autologous breast reconstruction, there were 1,529 (21.3%) latissimus dorsi (LD) flaps, 1,133 (15.8%) transverse rectus abdominus myocutaneous (TRAM) flaps, and 2,760 (38.4%) free flaps performed. Overall, there were 330 (6.7%) readmissions in autologous breast reconstruction, with 87 (5.7%) readmissions in LD flaps, 95 (8.4%) readmissions in TRAM flaps, and 180 (6.5%) readmissions in free flaps. Multivariate regression analysis demonstrated that age, obesity, ASA class of 3 or greater, tobacco smoking, diabetes mellitus, prolonged operative times, and prolonged initial admissions were independent risk factors for readmission. Additionally, having a TRAM flap reconstruction was an independent risk factor for readmission when controlling for confounding variables.

Conclusions: These risk factors can aid in patient selection, flap selection, surgical planning, and post-operative allocation of resources for patients undergoing autologous breast reconstruction.

Table 1. Univariate analysis on patient demographics and preoperative risk factors for readmission.

Variables	Readmission (n=330)	No Readmission (n=4397)	p Value
Age, mean (SD)	53.0 (10.1)	51.9 (9.8)	0.037
Race, % (n)			0.006
White	78.8 (260)	74.1 (3260)	
Black	14.5 (48)	13.4 (591)	
Hispanic	6.1 (20)	7.6 (335)	
Asian	0.3 (1)	4.2 (184)	
Other/Unknown	0.3 (1)	0.6 (27)	
BMI, mean (SD)	31.0 (6.9)	28.8 (6.2)	<0.001
Obese, % (n)	9.3 (190)	5.1 (172)	<0.001
ASA ≥3, % (n)	9.2 (157)	5.5 (205)	<0.001
Smoking, % (n)	9.4 (52)	6.4 (310)	0.006
Pre-Operative Comorbidities, % (n)			
Diabetes	12.0 (43)	6.3 (319)	<0.001
Hypertension	8.6 (126)	6.0 (236)	0.001
Wound/Wound Infection	5.0 (4)	6.7 (358)	0.545
Steroid Use	9.5 (10)	6.6 (352)	0.238
Bleeding Disorder	10.9 (5)	6.6 (357)	0.253
Chemotherapy	7.5 (7)	7.7 (76)	0.954
Radiotherapy	6.3 (1)	7.6 (81)	0.836
Disseminated Cancer	11.3 (7)	6.6 (355)	0.143
Anemia	8.1 (71)	6.2 (242)	0.044

Peri-Operative Variables			
Operative Time, mean (SD)	436.4 (209.5)	399.9 (193.6)	0.001
Total Length of Stay, mean (SD)	4.7 (5.8)	3.8 (6.0)	0.005
Post-Operative Complications, % (n)			
Return to OR	31.8 (175)	3.8 (187)	<0.001
General Complications	24.2 (284)	1.8 (78)	<0.001
Cardiac Complication	28.6 (2)	6.6 (360)	0.020
Pulmonary Complication	45.5 (15)	6.4 (347)	<0.001
Thromboembolic Complication	56.7 (34)	6.1 (328)	<0.001
Wound Complication	47.0 (159)	4.0 (203)	<0.001

Table 2. Multivariate regression analysis identifying independent risk factors for readmission.

Variables	Multivariate Adjusted Odds Ratio	p Value
LD Flap Reconstruction	(Reference)	---
TRAM Flap Reconstruction	1.723 (1.235-2.403)	0.001
Free Flap Reconstruction	1.218 (0.909-1.634)	0.187
Age	1.014 (1.001-1.027)	0.035
Obese	1.534 (1.204-1.955)	0.001
ASA ≥3	1.499 (1.172-1.917)	0.001
Smoking	1.498 (1.058-2.120)	0.023
Diabetes	1.536 (1.051-2.246)	0.027
Hypertension	1.068 (0.813-1.402)	0.636
Disseminated Cancer	1.034 (0.365-2.934)	0.949
Anemia	1.303 (0.986-1.722)	0.063
Prolonged Operative Time	1.355 (1.043-1.760)	0.023
Prolonged Length of Stay	1.506 (1.178-1.926)	0.001