



Risk Factors for Adverse Outcomes in Abdominally-Based Autologous Breast Reconstruction



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BACKGROUND

Autologous breast reconstruction is most commonly abdominally based. Healthy tissue can be harvested from a deep inferior epigastric perforator (DIEP), pedicled transverse rectus abdominis musculocutaneous (pTRAM) or free transverse rectus abdominus musculocutaneous (fTRAM) flaps. However, these flaps subject a patient to significant abdominal wall morbidity. A comparative analysis of similar DIEP, pTRAM and fTRAM flaps for breast reconstructions is necessary to better understand major risk factors for adverse outcomes. The purpose of this study is to determine the safety and advantages of a DIEP vs. pTRAM vs. fTRAM flaps for breast reconstruction.

METHODS

Admitted patients with either a DIEP or pTRAM or fTRAM breast flap were analyzed using the National Inpatient Sample (NIS) database from the years 2005-2014. Demographics, clinical data, and outcomes were collected. The relationship between mortality and the predictors was assessed using a stratified analysis, multivariable logistic regression model, and multivariable generalized additive model.

FIGURES

Table 1: Characteristics of admitted patients with a breast flap procedure. Data was stratified according to breast flap, NIS 2005-2014.

		Breast Flap, N (%)			p
		pTRAM	fTRAM	DIEP	
All Cases		3,544 (26)	3,498 (26)	6,545 (48)	
Sex, Female		3,511 (99)	3,466 (99)	6,545 (99)	<0.001
Race	White	2,294 (69)	1,124 (68)	4,244 (69)	0.052
	Black	487 (15)	433 (14)	781 (13)	
	Hispanic	310 (9)	334 (11)	615 (10)	
	Asian/Pacific Islander	94 (3)	108 (3)	228 (4)	
	Native American	11 (0.3)	7 (0.2)	18 (0.3)	
	Other	103 (3)	111 (4)	232 (4)	
Insurance	Private Insurance	2,526 (71)	2,517 (72)	5,392 (83)	<0.001
	Medicare	445 (13)	405 (12)	449 (7)	
	Medicaid	397 (11)	392 (11)	437 (7)	
	Self-Pay	58 (2)	63 (2)	66 (1)	
	No Charge	8 (0.2)	9 (0.3)	10 (0.2)	
	Other	106 (3)	105 (3)	177 (3)	
Income Quartile	Quartile 1	623 (18)	564 (17)	963 (15)	<0.001
	Quartile 2	801 (23)	664 (20)	1,177 (18)	
	Quartile 3	978 (28)	941 (28)	1,641 (25)	
	Quartile 4	1,062 (31)	1,234 (36)	2,661 (41)	
Comorbidities	AIDS	1 (0.0)	1 (0.0)	0 (0)	0.400
	Alcohol Abuse	10 (0.3)	13 (0.4)	17 (0.3)	0.610
	Chronic Blood Loss	28 (0.8)	24 (0.7)	39 (0.6)	0.520
	Drug Abuse	10 (0.3)	8 (0.2)	22 (0.3)	0.630
	Hypothyroidism	378 (11)	380 (11)	671 (10)	0.600
	Liver Disease	16 (0.5)	23 (0.7)	30 (0.5)	0.350
	Fluid/Electrolyte Disorders	158 (4.5)	209 (6.0)	344 (5.3)	0.017
	Neurological Disorders	645 (2)	67 (2)	88 (1)	0.054
	Peripheral Vascular Disorders	11 (0.3)	13 (0.4)	23 (0.4)	0.900
	Psychoses	66 (2)	73 (2)	83 (1)	0.004
	Pulmonary Circulation Disorders	22 (0.6)	18 (0.5)	17 (0.3)	0.017
	Valvular Disease	60 (2)	66 (2)	105 (2)	0.580
Collagen Vascular Disease*		53 (2)	52 (2)	82 (1)	0.490
Experienced a Complication		237 (7)	336 (10)	554 (9)	<0.001
Reoperation		4 (0.1)	9 (0.3)	27 (0.4)	0.027
Died during hospitalization		3 (0.1)	2 (0.1)	1 (0.0)	0.260
		Mean (SD)	Mean (SD)	Mean (SD)	p
Age, Years		52.1 (9.6)	51.4 (9.4)	50.4 (9.1)	<0.001
Modified Frailty Index Score		0.5 (0.7)	0.5 (0.7)	0.5 (0.7)	<0.001
Time to First Breast Flap Procedure, Days		0.2 (1.4)	0.3 (2.4)	0.1 (0.8)	<0.001
Hospital Length of Stay (HLOS), Days		4.3 (4.1)	4.8 (4.4)	4.5 (2.2)	<0.001
Total Charges, Dollars		59,197 (48,864)	81,259 (63,132)	93,143 (56,811)	<0.001

FIGURES

Table 2: Complications and breast flap type. Data was stratified according to breast flap received. NIS 2005-2014.

	pTRAM	fTRAM	DIEP	p-value
All Cases	3,544 (26)	3,498 (26)	6,545 (48)	
Complication	237 (7)	336 (10)	554 (9)	<0.001
Hemorrhage/Hematoma Complicating a Procedure (998.11, 998.12)	77 (2.2)	136 (3.9)	264 (4.0)	<0.001
Thrombosis (453.4X, 453.8X)	15 (0.4)	34 (1.0)	82 (1.3)	<0.001
Vascular Complication of Other Vessels (997.79)	4 (0.1)	24 (0.7)	72 (1.1)	<0.001
Postoperative Infection (998.5, 998.59)	50 (1.4)	56 (1.6)	52 (0.8)	<0.001
Dehiscence (998.3X)	34 (1.0)	34 (1.0)	22 (0.3)	<0.001
Pulmonary Embolism/Infarction (415.1X)	20 (0.6)	13 (0.4)	7 (0.1)	<0.001
Breast Flap Failure (996.52)	39 (1.1)	48 (1.4)	87 (1.3)	0.530
Seroma (998.51)	38 (1.1)	42 (1.2)	64 (1.0)	0.580
Peripheral Vascular Complication (997.2)	5 (0.1)	13 (0.4)	13 (0.2)	0.100
Mechanical Complication of other Vascular Graft (996.1)	3 (0.1)	3 (0.1)	7 (0.1)	0.920

RESULTS

Patient group characteristics are presented in Table 1. The fTRAM group manifested the highest rate of complications and the longest HLOS. The pTRAM group had the lowest rates of complications. Table 2 summarizes the complications associated with each breast flap type. DIEP breast flaps have higher rates of hemorrhage/hematoma, thrombosis and vascular complications of other vessels, while the fTRAM group manifested the higher rate of post-operative infection and pTRAM patients presented with the highest rate of pulmonary embolism/infarction type of complications.

CONCLUSIONS

Patients with autologous breast reconstruction using a fTRAM flap had the highest rate of complications overall and the longest stay in the hospital. Patients with a pTRAM flap had the lowest overall complication rate.