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Comparison of Immediate Breast Reconstruction Outcomes in Patients With and Without Prior Cosmetic Breast Surgery

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Abstract

Background: Skin-sparing (SSM) and nipple-sparing mastectomy (NSM) with immediate breast reconstruction (IBR) have significantly increased. There is limited information on complications of IBR in patients with prior cosmetic breast surgery (CBS). We compare IBR outcomes in patients undergoing SSM and/or NSM with and without prior CBS.

Materials and Methods: Patients undergoing mastectomy from January 1, 2017 to December 31, 2019 were selected. Patient characteristics, surgical approach, and complications were compared between mastectomy and IBR cases for breasts with and without prior CBS. Binary logistic regression analysis was performed to identify predictors of complications and reconstruction loss.

Results: 956 mastectomies were performed in 697 patients, with IBR performed for 545 mastectomies in 356 patients. Median age was 51 (range 19–83), 45.8% of patients were age < 50, 62.6% of mastectomies were performed for breast cancer. 95 mastectomies (17.4%) were performed in breasts with prior CBS and 450 (82.6%) without. NSM was more frequently utilized for breasts with prior CBS ($P < .001$). Complications occurred in 80 mastectomies (14.7%); reconstruction loss in 30 (5.5%). On multivariable analysis, age ≥ 50 (OR 1.76, 95%CI 1.01–3.09, $P = .047$) and NSM (OR 2.11, 95%CI 1.17–3.79, $P = .013$) were associated with an increased risk of any complication. Prior CBS was not associated with an increased risk of complications (OR 1.11, 95%CI 0.58–2.14, $P = .743$) or reconstruction loss (OR 1.32, 95%CI 0.51–3.38, $P = .567$).

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Disclosure

There are no conflicts of interest from any author to disclose.

Conclusion: In this analysis of mastectomy and IBR, prior CBS was not associated with an increased risk of complications or reconstruction loss. In patients with prior CBS undergoing mastectomy, IBR may be safely performed.

Abstract

In patients undergoing skin-sparing or nipple-sparing mastectomy with immediate breast reconstruction, prior cosmetic breast surgery did not increase risk of surgical complications or reconstruction loss. Mastectomy and immediate breast reconstruction can be safety performed in appropriately selected patients who have had prior cosmetic breast surgery.

Keywords

Immediate breast reconstruction; Skin and nipple-sparing mastectomy; Breast reconstruction complications; Cosmetic breast surgery; Breast reconstruction loss

Introduction

Advances in breast surgical and reconstructive techniques have considerably improved cosmetic outcomes for patients undergoing mastectomy. Because of this, there has been a significant increase in utilization of skin-sparing (SSM) and nipple-sparing mastectomy (NMS) with immediate breast reconstruction (IBR) in patients undergoing surgery for both breast cancer and risk reduction. The number of women who are eligible for breast conserving surgery but who opt for mastectomy is on the rise, as is the number of women undergoing IBR.[1–2] According to the National Inpatient Sample Database,[2] from 2009 to 2014, nearly 137,000 women underwent IBR after mastectomy.

Breast augmentation procedures and mastopexy have also increased significantly over the last 20 years, increasing by 41% and 114%, respectively.[3] Breast augmentation has remained the most popular cosmetic procedure since 2006, with almost 300,000 women undergoing the procedure in 2019.[3] A large number of patients are also undergoing mastopexy, with > 110,000 procedures performed in 2019.[4] With breast cancer being the most common non cutaneous cancer in women in the United States, it is not uncommon to have breast cancer patients who have had prior cosmetic breast surgery (CBS).[5]

While there are many studies which have evaluated factors associated with complications after mastectomy and IBR, there are few that have specifically assessed complications in patients with prior CBS.[6–7] Utilizing data from a high-volume academic breast surgery program, we therefore sought to compare patient selection, surgical management, and surgical complications in patients undergoing SSM or NSM with IBR.

Materials and Methods

Data Source, Patient Selection, and Variables

All female patients undergoing mastectomy from January 1, 2017 to December 31, 2019 at the University of Miami Hospitals and the affiliated Jackson Memorial Hospital were selected from surgical records. Patients were included in the analysis if they underwent

mastectomy and IBR. Information was collected on patient characteristics, surgical data, and surgical outcomes. Patient characteristics included age, body mass index (BMI), comorbid conditions (diabetes or prior radiation therapy), smoking status (current or past), neoadjuvant systemic therapy, presence of a breast cancer genetic mutation, reason for mastectomy (cancer, risk reduction, or contralateral prophylactic), and prior CBS (augmentation, reduction and/or mastopexy, or augmentation + mastopexy). Surgical data included mastectomy procedure (unilateral or bilateral), type of mastectomy (NSM, SSM, or skin reducing) and incision type (inframammary fold, lateral radial, or vertical radial), axillary surgery (none, sentinel lymph node biopsy [SLNB], or axillary lymph node dissection [ALND]), mastectomy weight, use of acellular dermal matrix (ADM), type of reconstruction (tissue expander [TE], implant or autologous tissue) and placement of reconstruction (subpectoral or prepectoral). For patients who had breast implants at the time of mastectomy, the mastectomy weight was recorded as the size of the implant in cubic centimeters plus the weight in grams of the breast tissue removed to account for the extra volume. Data on surgical complications was collected including any infection treated with antibiotics, any unplanned returned to the operating room for bleeding, infection, or management of skin necrosis, and removal of reconstruction. Complications occurring up to 120 days post operatively were included since there were several late surgical complications and we wanted to ensure all complications were adequately captured within our dataset. This study was conducted as part of an Institutional Review Board approved protocol to assess surgical outcomes in cancer patients, and waiver of consent was granted due to its retrospective nature.

Statistical Analysis

Patient characteristics, surgical data and surgical outcomes were compared by χ^2 analyses for categorical variables and Mann-Whitney U analyses for continuous, nonparametric variables. Categorical variables were expressed as n(%), and continuous variables were expressed as median (interquartile range). Two distinct binary logistic regressions were performed to determine predictors of developing any complication or reconstruction loss. Complications were defined as any postoperative infection requiring antibiotics (oral or intravenous) or an unplanned return to the operating room within 120 days of initial surgery. Reconstruction loss was defined as the need to remove the TE or implant without placing a new reconstructive device or loss of flap. Predictors included in each model were: age greater than 50, presence of obesity (as defined by BMI), comorbid conditions, current smoking status, receipt of neoadjuvant systemic therapy, prior CBS, reason for mastectomy (cancer, prophylactic, or risk reduction), unilateral or bilateral mastectomy performed, extent of lymph node surgery, mastectomy weight greater than 500 grams, use of ADM, and type of reconstruction performed. All P values were from 2-sided tests and results were deemed statistically significant at $P < .05$. Statistical analysis was performed using SPSS version 26 (IBM Corporation, Armonk, NY, copyright 2019).

Results

Between 2017 and 2019, a total of 956 mastectomies were performed in 697 patients. IBR was performed for 545 mastectomies in 356 patients and these patients and cases were included in our analysis. (Table 1)

Patient Characteristics

Median age was 51 (range 19–83) with 45.8% of patients under the age of 50. Median BMI was 26.5 with 61% of the patients classified as overweight (BMI 25–29.9) or obese (BMI ≥ 30). Only 4.8% of patients were current tobacco users, and only 4.2% of breasts had prior breast radiation. Almost 29% of patients received neoadjuvant systemic therapy, and 62.6% of patients had surgery for breast cancer. (Table 1)

Surgical Data

Bilateral mastectomy was performed in 189 patients (53.1%), unilateral mastectomy in 157 patients, and 5 patients underwent 2 unilateral mastectomies at different times (10 total). (Table 1) There were 95 mastectomies (17.4%) performed on breasts with prior CBS, the majority of which were breast augmentations alone (51.6%), and 450 mastectomies (82.6%) on breasts without prior CBS. Skin sparing mastectomy using a central incision around the nipple areolar complex was utilized in 64% of patients and 64% of patients had axillary surgery, either SLNB or ALND. The median mastectomy weight was 554 grams and 57.6% of patients had mastectomy weight > 500 grams. Tissue expanders were most commonly used for reconstruction (61.3%), prepectoral reconstruction was performed in 46.7% of cases, and ADM was utilized for reconstruction in almost 75% of cases.

Comparison of Patients with and without Prior Cosmetic Breast Surgery

Nipple sparing mastectomy was performed in 29.4% of mastectomy cases and was more frequently performed for breasts with prior CBS ($P < .001$), 45.3% versus 26% of breasts without and without prior CBS. (Table 1) Nipple sparing mastectomy performed with a vertical radial incision was also more commonly performed for breasts with prior CBS compared to those without (44.2% vs. 17.9%). All other patients and surgical factors were similar between the 2 groups of patients.

Analysis of Complications

Complications occurred in a total of 80 mastectomy procedures (14.7%). Skin necrosis requiring reoperation occurred in 7.9% of breasts, infection in 9.7% of breasts, and complete loss of reconstruction in 5.5% of breasts. Overall, loss of reconstruction occurred in 30 mastectomy cases, 7 with prior CBS and 23 without. Multivariable analysis of predictors for developing any complication showed that age ≥ 50 (OR 1.76, 95% CI 1.01–3.09, $P = .047$) and NSM (OR 2.11, 95% CI 1.17–3.79, $P = .013$) were associated with an increased risk of developing any complication. (Table 2) A similar analysis performed to assess predictors of reconstruction loss showed a trend for an increased risk of reconstruction loss in patients undergoing NSM (OR 2.26 (95% CI 0.94–5.46), $P = .069$) and direct to implant (DTI) reconstruction (OR 2.23 (95% CI 0.97–5.16), $P = .060$), although this did not reach statistical significance. (Table 3) Prior CBS was not associated with an increased likelihood

of complications (OR 1.11, 95% CI 0.58–2.14, $P = .743$) or reconstruction loss (OR 1.32, 95% CI 0.51–3.38, $P = .567$).

In order to further evaluate whether there was an association between prior CBS, type of mastectomy, and risk of complications, we performed 2 additional subgroup analyses: (1) NSM stratified by prior CBS status and (2) Breasts with prior CBS stratified by type of mastectomy performed. For NSM, there was no difference in complications rates between breasts with and without prior CBS. In addition, multivariable analysis for NSM showed that CBS was not a predictor of an increased risk of any complication (OR 0.70, 95% CI 0.23–2.10, $P = .519$) or reconstruction loss (OR 0.93, 95% CI 0.23–5.12, $P = .915$). A similar analysis for breasts with prior CBS showed no difference in complications rates whether a NSM or SSM was performed. Multivariable analysis for breasts with prior CBS also showed that NSM was not a predictor of an increased risk of developing any complication (OR 1.01, 95% CI 0.25–4.14, $P = .988$) or reconstruction loss (OR 8.13, 95% CI 0.49–134.69), $P = .143$).

Discussion

Nipple-sparing and skin-sparing mastectomy with IBR are being increasing utilized for patients undergoing prophylactic and therapeutic mastectomy procedures. However, the current literature is lacking in larger studies that evaluate mastectomy and IBR outcomes in patients who have had prior CBS. This is the largest study to date to analyze surgical outcomes for mastectomy and IBR in patients with prior CBS and helps to address this knowledge gap. We found that patients who were > 50 years old or underwent NSM were more likely to have complications. However, prior CBS was not associated with an increased likelihood of developing complications or reconstruction loss. This data supports the safety of mastectomy and IBR in appropriately selected patients who have had prior CBS.

Skin flap necrosis and infection are morbid complications that impact the quality of life of patients, increase hospital readmission rates, and can delay important cancer therapies. While there are many studies that have evaluated complication rates in patients undergoing SSM and NSM with IBR, there are few which have specifically examined complications in patients with prior CBS.[6, 8–10] The small studies which are reported in the literature show mixed results with some showing increased rates of mastectomy flap ischemia and reconstruction loss in patients with prior breast augmentation, while others show no difference in complication rates.[4, 11–13] A recent publication from Hammond et al.[14] which evaluated complications in 468 patients undergoing breast reconstruction, of whom 72 had prior breast augmentation procedures, showed no significant difference in overall complications, infection rates, mastectomy flap necrosis, or reconstruction loss between the 2 groups of patients. However, patients with prior breast augmentation procedures were more likely to have an unplanned return to the operating room (OR 2.28, 95% CI 1.28–4.05; $P = .005$). While we showed similar rates of infection (9.7% vs. 11%) and mastectomy flap necrosis (7.9% vs. 10%) in our breast reconstructions compared to this study, we had a significantly lower rate of reconstruction loss (5.5% vs. 17%). An additional meta-analysis which compared outcomes in 241 breast reconstructions with prior augmentation and 1441

reconstructions without, also showed no difference in overall complications, infection rates, skin flap necrosis, and prosthesis loss.[15]

Complications occurred in 14.7% of our mastectomy procedures, mainly infections (9.7%) and skin necrosis requiring operative intervention (7.9%), and there was no association with prior CBS. However, age > 50 and NSM were both associated with an increased likelihood of developing complications. While NSM provides improved cosmesis for women undergoing mastectomy, it is not without increased complications. A systematic review of 12,358 NSM cases found an overall complication rate of 22.3%.[16] While there are few studies which directly compare NSM and SSM techniques, a publication from Memorial Sloan Kettering Cancer Center which examined skin flap necrosis in 606 mastectomy and IBR procedures (511 SSM and 95 NSM) showed that NSM was associated with a significantly greater rate and higher degree of skin necrosis.[17]

Reconstruction loss was observed in 5.5% of our breast reconstructions, and there was no significant difference in those patients with and without prior CBS (7.4% vs. 5.1%, $P = .381$). However, we did see a trend for an increased risk of reconstruction loss in patients undergoing NSM and DTI reconstruction, and potentially with greater patient numbers, statistical significance would have been demonstrated. While the results in the literature are varied, there are multiple studies that show that DTI reconstruction increases complication rates and reconstruction loss.[7, 18–20] A systematic review which compared one-stage DTI reconstruction to 2-stage reconstruction and included 13 studies and 5216 breast reconstructions found that DTI reconstruction was associated with an increased risk of skin necrosis and reoperation and almost a 2-fold higher risk of implant loss (OR 1.87, $P = .04$).[21] A similar analysis that examined reconstruction outcomes utilizing the ACS-NSQIP database showed that early implant loss was associated with obesity, older age, smoking, bilateral procedures, and DTI reconstruction.[10]

Other factors that have been shown to increase complication rates and prosthesis loss after IBR including increasing BMI, larger breast size, prior radiation therapy, smoking, and use of ADM were not found to be significant in our analysis.[6, 10, 22–25] Over 28% of our patients were considered obese and the median breast size was > 500 grams. In addition, almost 75% of the breast reconstructions utilized ADM. Even with inclusion of a higher risk patient cohort, our overall complication rate, infection rate, and reconstruction loss were similar to or lower than many studies reported in the literature and attest to the importance of surgeon experience in optimizing reconstruction outcomes.[8]

While this study has many strengths, there are also potential limitations. The retrospective nature of the study limits the inclusion of unmeasured confounders and variables unavailable in the medical record. Patients referred from other medical centers may also not have information available from prior treatments, which may further confound results. Additionally, this study was performed at a single, high-volume academic center, so the generalizability of the results is unclear. However, this study is the largest series in the literature to date to examine mastectomy and IBR outcomes in patients with prior CBS. In addition, although from a single institution, the breast surgical procedures were performed

by 5 different breast surgeons and 8 different plastic surgeons with different surgical techniques. Therefore, this may provide a realistic view of expected complications.

Conclusion

Advances in breast surgical and reconstruction techniques have made SSM or NSM with IBR an attractive option for women undergoing mastectomy for breast cancer or risk reduction. As CBS continues to grow in popularity, it is likely that more patients undergoing mastectomy will have a history of these prior procedures. Our study shows that in patients undergoing SSM or NSM with IBR, prior CBS does not appear to increase risk of surgical complications or reconstruction loss. Therefore, mastectomy and IBR can be safety performed in appropriately selected patients who have had prior CBS.

Abbreviations:

SSM	skin-sparing mastectomy
NSM	nipple-sparing mastectomy
IBR	immediate breast reconstruction
CBS	cosmetic breast surgery

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Clinical Practice Points

Advances in breast surgical and reconstruction techniques have made SSM or NSM with IBR an attractive option for women undergoing mastectomy for breast cancer or risk reduction. As CBS continues to grow in popularity, it is likely that more patients undergoing mastectomy will have a history of these prior procedures. Our study shows that in patients undergoing SSM or NSM with IBR, prior CBS does not appear to increase risk of surgical complications or reconstruction loss. Therefore, mastectomy and IBR can be safety performed in appropriately selected patients who have had prior CBS.

Table 1

Patient Characteristics, Surgical Data, and Surgical Outcomes

	Total	Prior Cosmetic Surgery n (%)	No Prior Cosmetic Surgery n (%)	*P* Value
Patient Characteristics				
Number of patients (n)	356	66	290	–
Number of breasts (n)	545	95	450	–
Age (median, range)	51 (19–83)	50 (27–80)	51 (19–83)	
Age categories				.447
< 50	163 (45.8)	33 (50.0)	130 (44.8)	
≥ 50	193 (54.2)	33 (50.0)	160 (55.2)	
Body mass index (median, range)	26.5 (16.6–48.9)	26.1 (19.0–39.9)	26.6 (16.6–48.9)	
Body mass index categories				.612
Underweight (< 18.5)	4 (1.1)	0 (0.0)	4 (1.4)	
Normal (18.5–24.9)	135 (37.9)	27 (40.9)	108 (37.2)	
Overweight (25–29.9)	115 (32.3)	23 (34.8)	92 (31.7)	
Obese (≥ 30)	102 (28.7)	16 (24.2)	86 (29.7)	
Comorbid conditions				
Diabetes	22 (6.2)	5 (7.6)	17 (5.9)	.602
Prior breast radiation	15 (4.2, 23 breasts)	3 (4.5, 5 breasts)	12 (4.1, 18 breasts)	.882
Current tobacco use	17 (4.8)	2 (3.0)	15 (5.2)	.461
Neoadjuvant systemic therapy	102 (28.7)	14 (21.2)	88 (30.3)	.139
Breast cancer gene mutation	71 (19.9)	17 (25.8)	54 (18.6)	.190
BRCA1/2	44 (12.4)	13 (19.7)	31 (10.7)	
Other	28 (7.9)	4 (6.1)	24 (8.3)	
Reason for Mastectomy				.750
Breast Cancer	341 (62.6)	62 (65.3)	279 (62.0)	
Contralateral prophylactic	119 (21.8)	18 (18.9)	101 (22.4)	
Risk reduction	85 (15.6)	15 (15.8)	70 (15.6)	
Prior cosmetic breast surgery				–
Augmentation	49 (51.6)	49 (51.6)	-	

Clin Breast Cancer. Author manuscript; available in PMC 2022 February 08.

	Total	Prior Cosmetic Surgery n (%)	No Prior Cosmetic Surgery n (%)	*P* Value
Reduction and/or Mastopexy	31 (32.6)	31 (32.6)	-	
Augmentation + Mastopexy	15 (15.8)	15 (15.8)	-	
Surgical Data				
Mastectomy procedure				.099
Unilateral	167 (46.9)	37 (56.1)	130 (44.8)	
Bilateral	189 (53.1)	29 (43.9)	160 (55.2)	
Type of mastectomy				< **.001**
Nipple-sparing	160 (29.4)	43 (45.3)	117 (26.0)	
Inframammary fold	102 (63.7)	20 (46.5)	82 (70.1)	
Lateral radial	18 (11.3)	4 (9.3)	14 (12.0)	
Vertical radial	40 (25.0)	19 (44.2)	21 (17.9)	
Skin-sparing	349 (64.0)	48 (50.5)	301 (66.9)	
Skin-reducing (Wise pattern)	36 (6.6)	4 (4.2)	32 (7.1)	
Axillary Surgery				.468
None	196 (36.0)	32 (33.7)	164 (36.4)	
Sentinel Lymph Node Biopsy	273 (50.1)	46 (48.4)	227 (50.4)	
Axillary Lymph Node Dissection	76 (13.9)	17 (17.9)	59 (13.1)	
Mastectomy weight grams (median, IQR)*	554 (384–799)	580 (346–840)	550 (388–778)	.488
≤ 500 grams	217 (42.4)	39 (42.9)	178 (42.3)	.92
> 500 grams	295 (57.6)	52 (57.1)	243 (57.7)	
Use of Acellular Dermal Matrix	405 (74.3)	76 (80.0)	329 (73.1)	.163
Type of reconstruction				.104
Tissue Expander	334 (61.3)	53 (55.8)	281 (62.4)	
Subpectoral	178 (53.3)	29 (54.7)	149 (53.0)	
Prepectoral	156 (46.7)	24 (45.3)	132 (47.0)	
Implant	187 (34.3)	41 (43.2)	146 (32.4)	
Subpectoral	34 (18.2)	19 (46.3)	15 (10.2)	
Prepectoral	153 (81.8)	22 (53.7)	132 (89.8)	
Autologous tissue	22 (4.0)	1 (1.1)	21 (4.7)	

Clin Breast Cancer. Author manuscript; available in PMC 2022 February 08.

	Total	Prior Cosmetic Surgery n (%)	No Prior Cosmetic Surgery n (%)	*P* Value
Autologous tissue + Tissue expander	2 (0.4)	0 (0.0)	2 (0.4)	
Surgical Outcomes[#]				
Any complication	80 (14.7)	15 (15.8)	65 (14.4)	.736
Postoperative bleeding	6 (1.1)	1 (1.1)	5 (1.1)	.96
Skin necrosis requiring reoperation	43 (7.9)	6 (6.3)	37 (8.2)	.531
Infection treated with antibiotics	53 (9.7)	11 (11.6)	42 (9.3)	.502
Complete loss of reconstruction	30 (5.5)	7 (7.4)	23 (5.1)	.381

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Table 2

Binary Logistic Regression Identifying Predictors of any Complications

Variable		OR (95% CI)	*P* Value
Age at Surgery			
	< 50	1 (Reference)	
	50+	1.76 (1.01–3.09)	**.047**
Body Mass Index (BMI)			
	Normal, Underweight, or Overweight (< 30)	1 (Reference)	
	Obese (30+)	1.05 (0.57–1.94)	.869
Comorbid Conditions			
	No	1 (Reference)	
	Yes	1.00 (0.43–2.33)	.998
Current Smoker			
	No	1 (Reference)	
	Yes	1.97 (0.73–5.34)	.181
Neoadjuvant Therapy			
	No	1 (Reference)	
	Yes	1.03 (0.57–1.85)	.923
Prior CBS			
	No	1 (Reference)	
	Yes	1.11 (0.58–2.14)	.743
Reason for Mastectomy			
	Cancer	1 (Reference)	
	Risk Reduction or Prophylactic	1.07 (0.39–2.91)	.893
Type of Mastectomy			
	Skin Sparing or Skin Reducing	1 (Reference)	
	Nipple Sparing	2.11 (1.17–3.79)	**.013**
Mastectomy Procedure			
	Unilateral	1 (Reference)	
	Bilateral	1.17 (0.62–2.21)	.628

Variable	OR (95% CI)	*P* Value
Lymph Node Surgery		
None	1 (Reference)	
Sentinel Lymph Node Biopsy	1.51 (0.55–4.15)	.422
Axillary Lymph Node Dissection	1.62 (0.48–5.43)	.436
Mastectomy Weight		
≤ 500 grams	1 (Reference)	
> 500 grams	1.46 (0.82–2.60)	.198
Use of ADM		
No	1 (Reference)	
Yes	1.15 (0.57–2.33)	.700
Type of Reconstruction		
Tissue Expander or Flap	1 (Reference)	
Implant	1.17 (0.66–2.06)	.595

Table 3

Binary Logistic Regression Identifying Predictors of Reconstruction Loss

Variable		OR (95% CI)	*P* Value
Age at Surgery			
	< 50	1 (Reference)	
	50+	1.71 (0.71–4.14)	.231
Body Mass Index (BMI)			
	Normal, Underweight, or Overweight (< 30)	1 (Reference)	
	Obese (30+)	0.78 (0.28–2.15)	.631
Comorbid Conditions			
	No	1 (Reference)	
	Yes	2.31 (0.72–7.38)	.159
Current Smoker			
	No	1 (Reference)	
	Yes	1.73 (0.36–8.31)	.494
Neoadjuvant Therapy			
	No	1 (Reference)	
	Yes	1.01 (0.42–2.45)	.976
Prior CBS			
	No	1 (Reference)	
	Yes	1.32 (0.51–3.38)	.567
Reason for Mastectomy			
	Cancer	1 (Reference)	
	Risk Reduction or Prophylactic	0.62 (0.12–3.30)	.579
Type of Mastectomy			
	Skin Sparing or Skin Reducing	1 (Reference)	
	Nipple Sparing	2.26 (0.94–5.46)	.069
Mastectomy Procedure			
	Unilateral	1 (Reference)	
	Bilateral	1.32 (0.49–3.59)	.579

Variable	OR (95% CI)	*P* Value
Lymph Node Surgery		
None	1 (Reference)	
Sentinel Lymph Node Biopsy	1.01 (0.19–5.30)	.994
Axillary Lymph Node Dissection	1.35 (0.20–9.01)	.759
Mastectomy Weight		
≤ 500 grams	1 (Reference)	
> 500 grams	1.47 (0.60–3.58)	.402
Use of ADM		
No	1 (Reference)	
Yes	5.58 (0.70–44.70)	.106
Type of Reconstruction		
Tissue Expander or Flap	1 (Reference)	
Implant	2.23 (0.97–5.16)	.060