

# Impact of Breast Reconstruction Patients on Cosmetic Practice

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**Background:** Postmastectomy breast reconstruction can often restore a patient's self-image. A notable percentage of women will go on to seek elective aesthetic procedures to further improve their perceived appearance. The purpose of this study was to determine the percentage of primary breast reconstruction patients who go on to receive a cosmetic procedure. We identify factors that may increase the likelihood that a patient subsequently chooses to pursue a cosmetic procedure.

**Methods:** A retrospective review of primary breast reconstruction patients of the two senior authors was conducted from January 2014 through December 2015. Demographics, types of cosmetic procedures received, and time to first cosmetic procedure were obtained. Time to first cosmetic procedure was assessed from date of mastectomy through December 2017. Logistic regression was performed to identify factors associated with obtaining cosmetic procedures.

**Results:** There were 289 patients in our cohort with ~10% who subsequently sought a cosmetic procedure at our practice. The average time to conversion was ~9 months after mastectomy. The majority (67%) underwent noninvasive procedures only. Patients with lower-staged breast cancers were more likely to undergo a cosmetic procedure ( $P < 0.042$ ).

**Conclusions:** At least 10% of patients undergoing primary breast reconstruction over a year period went on to have a cosmetic procedure during the study period. The majority of patients pursued noninvasive cosmetic procedures. Reconstruction of women with higher cancer stages was associated with a lower likelihood of pursuing a cosmetic procedure during the time period studied. (*Plast Reconstr Surg Glob Open* 2021;9:e3614; doi: [10.1097/GOX.0000000000003614](https://doi.org/10.1097/GOX.0000000000003614); Published online 15 June 2021.)

## INTRODUCTION

Based on the latest data from the Centers for Disease Control and Prevention, there were 250,520 women diagnosed with breast cancer in 2017.<sup>1</sup> Fortunately, with more robust screening and awareness, breast cancer is being caught at earlier stages in women, allowing for earlier intervention.<sup>2-4</sup> Many patients seek reconstruction to reestablish breast shape and volume in an effort to limit the adverse biopsychosocial impact of mastectomy. Breast

reconstruction can aid in restoring a patient's body image and sense of femininity as well as improving her overall quality of life.<sup>5-8</sup>

Breast cancer-naïve women at a high risk for developing breast cancer can opt for bilateral prophylactic mastectomies, whereas those who have developed unilateral breast cancers often opt for contralateral prophylactic mastectomies. Contralateral prophylactic mastectomy rates, however, have also increased for women in scenarios where undergoing preventative mastectomy does not clearly influence overall survival.<sup>9</sup> Improved aesthetic outcomes may increase the likelihood that women consider postmastectomy breast reconstruction, thereby increasing overall rates of these procedures.<sup>10</sup> A high-quality cosmetic result is in part due to improved symmetry between breasts. Although a trend towards increased prophylactic mastectomy rates noted in the literature is most strongly linked to breast cancer risk reduction, the potential impact on improving cosmesis should not be discounted.<sup>9,11-13</sup>

Women who undergo breast reconstruction may choose to undergo subsequent aesthetic procedures

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Received for publication February 3, 2021; accepted April 8, 2021. Presented at the American Society of Plastic Surgeons (ASPS) 2018 Plastic Surgery the Meeting, Chicago, Ill.

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DOI: [10.1097/GOX.0000000000003614](https://doi.org/10.1097/GOX.0000000000003614)

**Disclosure:** The senior author (TMM) receives grant funds and is a paid consultant for RTI. All the other authors have no financial interest in relation to the content of this article.

afterward for several reasons. For one, while reconstruction may help improve a woman's self-image, studies have also demonstrated that breast reconstruction alone may not be enough, or perhaps the wrong decision, with some patients becoming more negatively aware of the postoperative changes to their bodies and their sexuality.<sup>5-7,10,14</sup> For women who retain a negative body image following mastectomy with reconstruction, additional cosmetic procedures may serve to improve their perceived body image.<sup>7</sup> In some instances, women may have a particular aesthetic concern that they are either reluctant to seek care for, or simply do not realize could be addressed by a plastic surgeon. A favorable experience and exposure to reconstruction may alter their perceptions of plastic surgery, and expand their awareness of available solutions. This, in turn, emboldens them to address their aesthetic concerns once their breast cancer and reconstruction are addressed. Women may also receive a breast cancer diagnosis or chose to undergo a preventative mastectomy at a younger age, before they would have considered undergoing an aesthetic procedure. For these women, a particular aesthetic concern simply developed subsequent to their breast cancer with reconstruction cycle of care.

The purpose of this study was to look at the rate of primary breast reconstruction patients choosing to receive either noninvasive or surgical cosmetic procedures after mastectomy and reconstruction. We also sought to identify factors that may make a patient more likely to go on to obtain a cosmetic procedure after reconstruction.

## PATIENTS AND METHODS

### Experimental Design

With IRB approval (#201106126), we retrospectively reviewed primary breast reconstruction patients of the two senior authors from January 2014 to December 2015. Inclusion criteria included any patient undergoing a mastectomy during this time period with either immediate or delayed reconstruction with at least 2 years of follow-up. We included all types of reconstructions, including implant-based, autologous-based, or a combined approach. Chart review was performed and information gathered in regard to general demographics, cancer characteristics, oncologic and reconstructive surgical procedures performed, cosmetic procedures performed, and the timing to receiving their first cosmetic procedure. Time to procedure was determined from the time of their mastectomy because we included both immediate and delayed reconstructions. The time to first cosmetic procedure was recorded regardless of whether it was done as a separate, unrelated procedure or in conjunction with another reconstructive intervention. Contralateral procedures performed to optimize breast symmetry were not considered cosmetic, including liposuction done specifically for fat grafting to the breasts.

Review of cosmetic surgical and nonsurgical procedure billing data was cross-referenced with our reconstructive patient database to determine who had gone on

to receive subsequent cosmetic procedures. Information was gathered on the timing from mastectomy to initial cosmetic procedure, types of procedures obtained, and how often. Surgical procedures included any aesthetic procedure that was self-pay and not related to their breast reconstruction. This was assessed through December 2017 so that women who underwent postmastectomy breast reconstruction in our office as far back as December 2015 would have at least a 2 year period thereafter to determine whether they would undergo a cosmetic procedure in our practice.

Income data were also obtained on patients by using median family income based on zip code from publicly available United States census data. Median income over a span of 12 months was used, in 2015 inflation-adjusted dollars.<sup>15</sup>

### Statistical Analysis

Summary statistics were tabulated via established methods. The primary outcome was pursuit of a cosmetic procedure after mastectomy. Secondly we sought to evaluate timing to that initial cosmetic procedure and how frequently the patient received additional procedures. We then used a univariate logistic regression to identify potential patient, disease, and treatment variables that may have predicted this outcome. Final results were reported as odds ratios with 95% confidence intervals. Alpha = 0.05 indicated significance in all tests. STATA, v14.0 (College Station, Tex.) was used to perform all analyses.

## RESULTS

Descriptive statistics for the 289 primary breast reconstructions from January 2014 to December 2015 meeting inclusion criteria are summarized in [Table 1](#). Women ranged from 38 to 67 years old, and most were White (n = 247, 85%). The majority of patients presented with a stage 2 breast cancer (n = 88, 31%) and received a combination of chemotherapy and endocrine/hormonal therapy (n = 86, 30%) but did not require radiation (n = 212, 73%). There were 12 (4%) patients with bilateral breast cancer. Most commonly, patients underwent immediate tissue expander placement at time of mastectomy (n = 207, 72%) with exchange to a breast implant for definitive reconstruction (n = 213, 74%). The majority of patients had bilateral mastectomies with reconstruction (n = 218, 75%). Of the patients that underwent autologous reconstruction, the majority (n = 24, 39%) had a latissimus dorsi flap, followed by deep inferior epigastric perforator (n = 21, 34%) and free transverse rectus abdominis musculocutaneous flaps (n = 13, 21%).

An estimated 227 (79%) patients had private insurance, 34 (12%) had Medicare, 24 (8%) had Medicaid, one (0.3%) patient had combined Medicare and private insurance, while three (1%) patients were self-pay. The majority of our patients (n = 231, 82%) came from households with an annual median family income between \$20K and \$80K with the remainder (n = 58, 18%) coming from households with an annual median family income between \$80K and \$170K.

**Table 1. Patient Characteristics**

Characteristic	n (%)
<b>Race</b>	
White	247 (85%)
African American	25 (9%)
Asian	7 (2%)
Native American	2 (1%)
Other	8 (3%)
<b>Cancer stage</b>	
Prophylactic	36 (12%)
Stage 0	41 (15%)
Stage 1	84 (29%)
Stage 2	88 (31%)
Stage 3	28 (10%)
Stage 4	7 (2%)
Unknown	4 (1%)
Other: phyllodes tumor	1 (0.3%)
<b>Neo/adjuvant therapy</b>	
No therapy	79 (27%)
Chemo only	47 (16%)
Chemo/Endo	86 (30%)
Endo only	77 (27%)
No radiation	212 (73%)
Radiation	77 (27%)
<b>Immediate versus delayed</b>	
Delayed	13 (4%)
Immediate TE	207 (72%)
Immediate implant	53 (18%)
Immediate autologous	12 (4%)
Immediate autologous with TE	4 (1%)
<b>Type of reconstruction</b>	
Autologous	45 (16%)
Implant	213 (74%)
Autologous with implant	17 (6%)
Unknown	13 (4%)
Other: no definitive reconstruction	1 (0.3%)

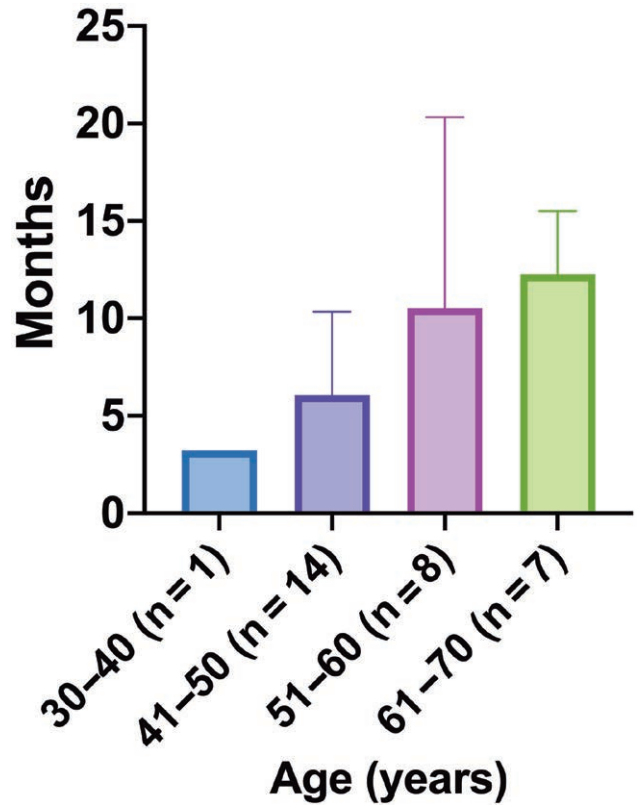
Chemo, chemotherapy; Endo, endocrine/hormonal therapy; TE, tissue expanders.

A total of 30 (10.4%) patients underwent at least one cosmetic procedure after mastectomy through December 2017. The average time to first cosmetic procedure was  $8.61 \pm 6.47$  months following the original mastectomy. On average, younger patients tended to receive their first cosmetic procedure sooner after mastectomy than older patients under the age of 50 years getting a cosmetic procedure within 6 months of mastectomy, and those older than 50 years tending to get their first cosmetic procedure at least 10 months after mastectomy (Fig. 1).

Of those women who underwent a cosmetic procedure, the majority underwent noninvasive cosmetic procedures only (n = 20, 66.7%). Six (20%) patients underwent surgical cosmetic procedures only, and four (13.3%) patients underwent both noninvasive and surgical cosmetic procedures.

**Noninvasive Cosmetic Procedures**

All noninvasive procedures were performed by the senior authors (TMM and MMT), nurse practitioners, or physician assistants within our practice. These services were advertised on the practice website and offered to patients upon their request if deemed an appropriate candidate. These patients averaged 4.96 procedures each (range 1–22) over this time period. Most commonly patients underwent chemodenevation treatments, followed by filler injections to the face. Less commonly, patients underwent laser treatments, including skin resurfacing and hair removal, cryolipolysis, or ultherapy

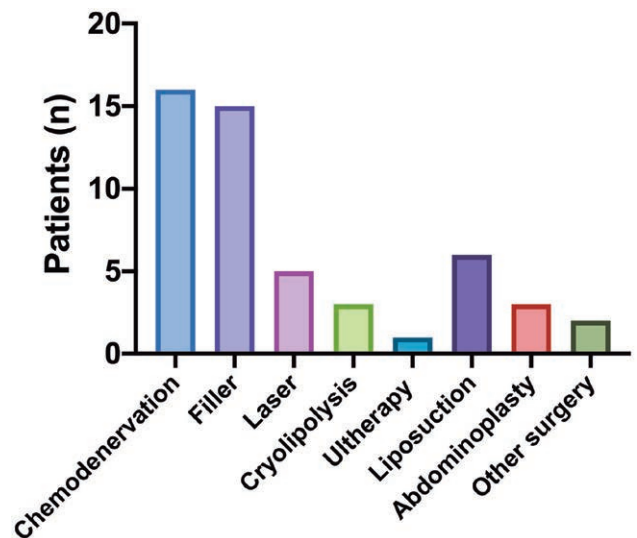


**Fig. 1.** Graph representing the conversion timeframe to cosmetic procedures, based on patient age.

(Fig. 2). Many patients had a combination of procedures performed during a single office visit.

**Surgical Cosmetic Procedures**

There were 10 (33%) patients who underwent a surgical procedure with 4 of those having also received



**Fig. 2.** Graph representing the types of noninvasive cosmetic procedures and surgical cosmetic procedures that patients underwent. “Other surgeries” included labiaplasty and rhytidectomy.

a noninvasive procedure. At the time of our analyses, patients who chose to pursue cosmetic surgery after breast reconstruction had only undergone a single anesthetic to achieve this, but with several procedures done at that time. The most common cosmetic surgery chosen by patients who had formerly undergone breast reconstruction was aesthetic liposuction of the trunk and/or extremities, and less commonly, abdominoplasty. There was one patient who had undergone rhytidectomy, and one who had undergone a labiaplasty (Fig. 2). These procedures were performed by our two senior authors and were out-of-pocket costs to the patient.

**Logistic Regression**

A logistic regression was performed to evaluate variables that made a patient more likely to have undergone a cosmetic procedure (Table 2). We found that cancer stage had an impact with patients being less likely to go on to receive a cosmetic procedure with increasing cancer stage (OR 0.07, CI 0.50–0.99, *P* = 0.042).

Although differences in income and age appeared to be statistically significant, the odds ratios were 1.00 and 1.038 respectively, showing no clinical difference (*P* = 0.004 and 0.039, respectively). No other factors appeared to correlate with the likelihood of having received a cosmetic procedure after mastectomy, including the race or BMI of the patient, the need for neoadjuvant or adjuvant therapies, including radiation, type of reconstruction (autologous, implant-based, or combined), or whether the patient had immediate versus delayed reconstruction (Table 2).

**DISCUSSION**

Women who choose to undergo postmastectomy breast reconstruction may seek additional cosmetic procedures to further improve their self-image. Breast reconstruction may serve an important restorative role for women undergoing cancer treatment. This improvement in self-image may be further enhanced by rejuvenation with cosmetic procedures.<sup>7</sup>

We found that ~10% of primary breast reconstruction patients in our practice went on to receive some form of a cosmetic procedure over the ≤3 year period that followed index mastectomy. On average, patients underwent a

procedure about 9 months after their mastectomy surgery. The majority of patients underwent noninvasive cosmetic procedures averaging about five treatments per patient. Surgical patients underwent one surgery each over the timeframe, during which they may have received multiple combined procedures. For some of our patients, their cosmetic procedures may have been done in conjunction with other reconstructive procedures. Our licensed nurse practitioners, physician assistants, and senior author plastic surgeons provided the nonsurgical cosmetic procedures for our patients. Surgical services were performed by the two senior authors.

The number of patients who went on to receive a cosmetic procedure was similar to that reported by Hsu et al, who looked at over 1200, mostly flap-based, breast reconstructive patients over 6.5 years and found that 9.3% had undergone a subsequent cosmetic procedure.<sup>7</sup> Commentary by Evans et al also references a group of 90 flap reconstruction patients with ~8% going on to receive a future cosmetic procedure over a 4-year period.<sup>16</sup> This 8%–10% range seems to hold despite the type of reconstruction done.

We ultimately found that as cancer stage increased, patients were less likely to go on to receive a cosmetic procedure. Given that additional cosmetic procedures are an out-of-pocket expense to the patient, it would seem that income would be an important factor. Potentially the same can be stated about age, where younger, presumably healthier patients, with a relatively longer life expectancy might be more interested or willing to pursue a cosmetic procedure. Our study may have been underpowered to show this clinical difference. We also did not have the true value of individual patient family incomes, but rather have publicly available data of median family incomes based on the patient’s zip code. This limitation may have precluded a more granular analysis of the impact of income on likelihood of pursuing additional cosmetic procedures.

In regard to the types of procedures our patients chose to undergo, we found that similar to Hsu et al, liposuction was the most frequent cosmetic surgical procedure performed.<sup>7</sup> For noninvasive procedures, we found that chemodenervation was the most common intervention followed by filler. Contrastingly, Hsu et al found filler followed by chemical peels to be the most frequent amongst their patients.<sup>7</sup>

Although reconstruction alone after mastectomy can offer psychological benefits to women, including improvements in anxiety/depression and better self-image, cosmetic procedures have also been noted to produce positive psychological effects and improvements in quality of life. Cosmetic procedures enable patients to address aspects of their appearance that cause psychologic distress outside of what troubles them with their breast reconstructions.<sup>8,17,18</sup> During a period in a patient’s life that is extremely difficult and stressful, plastic surgeons are uniquely suited to address these aesthetic concerns.

Although we did not assess this in our patient cohort, Hsu et al noted that patients who experienced an improvement in body image after breast reconstruction, or who were interested in cosmetic surgery before reconstruction,

**Table 2. Logistic Regression for Going On to Receive a Cosmetic Procedure**

Patient Factors	Logistic Regression			
	Odds Ratio	<i>P</i>	95% Confidence Interval	
			Lower	Upper
Race	1.009	0.963	0.695	1.465
Age	1.038	0.039	1.002	1.075
BMI	0.961	0.251	0.897	1.029
Median income	1.000	0.004	1.000	1.000
Chemo/endo therapy	1.012	0.946	0.711	1.441
Radiation therapy	0.702	0.439	0.286	1.721
Timing of reconstruction	1.610	0.549	0.340	7.637
Type of reconstruction	1.498	0.330	0.665	3.375
Cancer stage*	0.072	0.042	0.499	0.987

\*Significant finding.

were more likely to experience a further improvement in body image after a cosmetic procedure.<sup>7</sup> We were not able to confirm with our retrospective review whether our patients had a preexisting interest in cosmetic procedures. This could certainly have an impact on a patient's likelihood of pursuing cosmetic procedures after their reconstruction.

Although our study did not find that the types of reconstruction received impacted the likelihood of receiving subsequent cosmetic procedures, Alderman et al noted that autologous reconstructive patients were more aesthetically satisfied than implant-based reconstructive patients.<sup>19</sup> Perhaps the type of reconstruction does not play as much of a role as to whether a patient decides to pursue an unrelated cosmetic procedure, but more that they decide to pursue revision procedures like fat grafting, flap revisions or implant pocket modifications.

Another factor to keep in mind is that we did not assess specifically in this study a patient's prior knowledge or interest in what additional services plastic surgeons are able to provide outside their reconstructive needs. Building a good rapport with their surgeon during their reconstructive journey may have influenced their decision for future cosmetic procedures. Simply having the exposure to a plastic surgery office for their routine reconstructive follow-up visits may have influenced their decision to have a cosmetic procedure afterward. At our institution, we see patients in a "Privademic" setting. They are seen in a clinic office located in a hospital medical complex. Surgeries take place in the affiliated hospital. So, although fully academic, but also somewhat private, patients get the feel of both when visiting our practice. This may have impacted their decision.

Finally, we must keep in mind that although we, as plastic surgeons, want to do everything we can to help our patients feel whole again after surviving their breast cancer, we are still dealing with a vulnerable population. Therefore, it is not our practice to bring up the notion of adding additional cosmetic procedures to our reconstructive patients. Even though our practice advertises reconstructive and cosmetic services on our website and social media, we are merely educating our patients on the services we can provide them. When seeing a reconstructive patient in consultation, elective cosmetic procedures are not presented to the patient unless it has been specifically asked for by the patient and they are appropriate candidates, as additional procedures do not come without their own risks. This likely explains why we saw only 10% of patients go on to receive an additional cosmetic procedure, as this is something that is not actively pursued by our office in this patient population.

Ultimately the patient and surgeon must engage in a risk- and preference-sensitive shared decision-making process when considering a cosmetic procedure. In the context of patients with a history of breast cancer, though, completion of their oncologic management and reconstructive cycle of care must be completed before embarking upon elective aesthetic concerns even if they are viewed as a favorable adjunct to their overall well-being.

Limitations to our study include the retrospective nature of the study. We did not assess reconstructive complication rates and the impact this may have had on a patient's likelihood of going on to receiving a cosmetic procedure. We also did not assess whether or not patients had a prior cosmetic procedure or prior interest or knowledge of cosmetic surgery before developing their breast cancer. Neither did we assess other potential influential variables like continuous exposure to the office with follow-up visits, access to educational materials on services provided, or desire to minimize downtime by combining aesthetic and reconstructive procedures. Additionally, evaluation of a longer follow-up period may also have increased the percentage of women pursuing postreconstructive cosmetic procedures in our practice.

## CONCLUSIONS

Trends for cosmetic procedures continue to increase in the general population, with a 169% increase since the year 2000.<sup>20</sup> We have found in our cohort of primary breast reconstruction patients a 10% rate that had gone on to receive at least one cosmetic procedure. It is unclear if this correlates with the overall rate of the general population, but similar to the general public, a majority of patients pursued noninvasive procedures.<sup>20</sup> On average, this was within a year of their mastectomy. Reconstruction alone can have positive psychological benefits for breast cancer patients. Additional cosmetic procedures can also allow for even further improvements in self-image and quality of life. Performing reconstructive surgery gives surgeons the ability to help patients feel whole again, and it also provides a cohort of patients that may return to receive future cosmetic procedures.<sup>16</sup> However, the surgeon must keep in mind the vulnerability of this patient population when offering these elective procedures to reconstructive patients.

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## ACKNOWLEDGMENT

We thank Lauren Yaeger, MA, MLIS, Medical Librarian for her work with the literature review on this topic.

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