

Symmetrical Breast Reconstruction: Analysis of Secondary Procedures after Reconstruction with Implants and Autologous Tissue

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In our original article evaluating symmetry in breast reconstruction, we evaluated the role of three-dimensional digital photography.¹ Women were stratified into two groups, those who had three-dimensional photography and those who did not. Comparisons included initial volume and contour symmetry, secondary procedures, and final volume and contour symmetry. It was concluded that three-dimensional digital photography was a useful tool in certain situations, such as for postoperative ipsilateral or contralateral volume adjustment following autologous reconstruction and for preoperative determination of implant volume for delayed reconstruction. It was not necessary in most cases, however. Although secondary procedures were analyzed, the analysis was done as it related to three-dimensional digital photography.

This follow-up explores the role of secondary procedures in greater detail. Both expander/implant and autologous tissue reconstruction are studied without regard to three-dimensional digital photography.

METHODS

This was a retrospective review of 382 women who had breast reconstruction over a 4-year period from January of 1998 to January of 2002. Factors related to the reconstruction are provided in Table I. Analysis of symmetry was based on the observations of the patient and the assessment of the surgeon. All completed reconstructions were analyzed for symmetry based on five parameters. These included vol-

ume and contour symmetry after the initial reconstruction, the need for secondary procedures to improve symmetry, and volume and contour after the secondary procedures. The minimum follow-up for all patients was 11 months, and the mean follow-up was 21 months.

RESULTS

The results of the analysis are provided in Table II. Initial volume symmetry was observed more often following autologous reconstruction, whereas initial contour symmetry was obtained more often with implant reconstruction. Final volume and final contour symmetry were obtained more often with autologous tissue reconstruction. Secondary procedures were performed more often following autologous reconstruction. Figures 1 and 2 depict a woman after immediate unilateral breast reconstruction using autologous tissue, and Figures 3 and 4 depict a woman after delayed unilateral breast reconstruction using an expander/implant.

The secondary procedures that were performed are listed in Table III. Ipsilateral procedures were performed more often than contralateral procedures by a factor of 4. Recontouring of the skin and fat by means of direct excision was the most common secondary procedure, followed by reduction mammoplasty, mastopexy, implant augmentation, and implant exchange. The timing of reconstruction demonstrated that the frequency of secondary procedures was higher following de-

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TABLE I
Relevant Factors

	Women	Breasts
Total	334 (100%)	431 (100%)
Autologous	217 (65%)	277 (64%)
Implant	117 (35%)	154 (36%)
Unilateral	237 (71%)	237 (55%)
Bilateral	97 (29%)	194 (45%)
Immediate	271 (81%)	350 (81%)
Delayed	63 (19%)	81 (19%)

TABLE II
Results of Analysis

	Autologous (<i>n</i> = 217)	Implant (<i>n</i> = 117)	All (<i>n</i> = 334)
Initial volume symmetry	130 (60%)	66 (56%)	197 (59%)
Initial contour symmetry	67 (31%)	44 (38%)	110 (33%)
Secondary procedures	128 (59%)	46 (39%)	174 (52%)
Final volume symmetry	182 (84%)	88 (75%)	271 (81%)
Final contour symmetry	169 (78%)	70 (60%)	240 (72%)

layed reconstruction (48 of 81, 59 percent) compared with immediate reconstruction (126 of 350, 36 percent). Immediate reconstruction resulted in ipsilateral secondary procedures in 103 breasts (29 percent) and contralateral secondary procedures in 23 breasts (6.6 percent). Delayed reconstruction resulted in ipsilateral secondary procedures in 36 breasts (44 per-



FIG. 1. Preoperative photograph of a woman scheduled to have a left unilateral mastectomy and immediate reconstruction using a muscle-sparing free transverse rectus abdominis musculocutaneous flap.

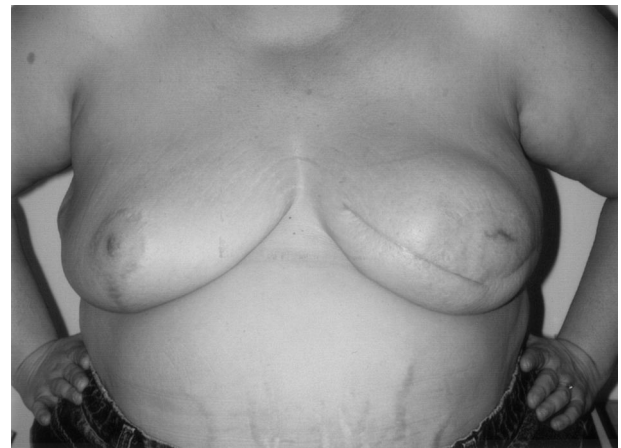


FIG. 2. Postoperative photograph after completion of the reconstructive process. Secondary procedures included a contralateral reduction mammoplasty and two ipsilateral revisions consisting of skin and fat recontouring.



FIG. 3. Preoperative photograph of a woman who scheduled for delayed two-stage implant reconstruction after a right mastectomy.

cent) and contralateral secondary procedures in 12 breasts (15 percent).

DISCUSSION

The past 50 years have been witness to significant advancements in the fields of plastic surgery and general surgery that have improved the quality of breast reconstruction. Advancements in plastic surgery include reconstruction utilizing a variety of autologous tissues, use of microvascular techniques, and refinements in implant reconstruction.²⁻⁶ Advancements in general surgery include skin-sparing mastectomy, sentinel lymph node biopsy, and the recognition that immediate reconstruction does not increase the risk of recurrence or impede the detection of recurrence in women with early stage breast can-

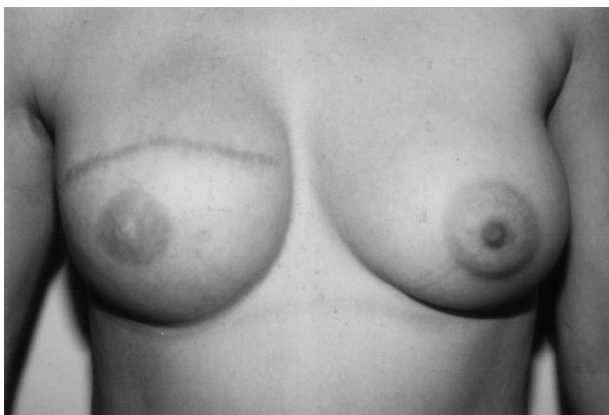


FIG. 4. Postoperative photograph after completion of the reconstructive process. The secondary procedure included a contralateral augmentation mammoplasty.

TABLE III
Secondary Procedures

	Ipsilateral	Contralateral
All (174 women)	139 (80%)	35 (20%)
Skin/fat excision	132 (95%)	0 (0%)
Implant exchange	4 (3%)	—
Implant augmentation	3 (2%)	4 (11%)
Mastopexy	—	15 (43%)
Reduction mammoplasty	—	16 (46%)

cer.⁷⁻⁹ These advancements have improved the quality of breast reconstruction following mastectomy and facilitated the ability to obtain symmetry.

As a result of these advancements, the expectations of women with breast cancer who have had or are going to have a mastectomy have changed. Many women now expect that the reconstruction will closely resemble the pre-morbid appearance of the breast and result in good symmetry. Although the ability to obtain symmetry is sometimes possible with a single operation, secondary procedures are often necessary. These secondary procedures may be necessary following breast reconstruction using autologous tissues or implants, when performed on an immediate or delayed basis, in women with certain volume requirements, and following unilateral or bilateral procedures. It was the intent of this study to further analyze women for symmetry and the need for secondary procedures following breast reconstruction with implants and with autologous tissue.

There are few reports in the literature that specifically analyze symmetry following breast reconstruction with implants or autologous tissue, and, of the few that do, most focus on the management of the contralat-

eral breast.¹⁰⁻¹⁵ There has been little reported on the management of the reconstructed breast to facilitate symmetry. Commonly performed symmetry procedures for the contralateral breast include reduction mammoplasty, mastopexy, and implant augmentation. Two recent reports have analyzed symmetry following unilateral breast reconstruction based on the need for secondary procedures on the contralateral breast. These studies differ from the present study in that only contralateral procedures, not ipsilateral procedures, were analyzed. Losken et al. have reviewed the Emory experience in 1394 women, of whom the reconstruction was immediate in 705 women and delayed in 689 women.¹⁰ It was reported that 67 percent of women required a contralateral symmetry procedure following delayed reconstruction compared with 22 percent in women who had immediate reconstruction. The incidence for secondary procedures was highest following reconstruction with implants (89 percent delayed and 57 percent immediate) compared with autologous tissue (59 percent delayed and 18 percent immediate). The most common secondary procedure was a contralateral implant augmentation (41 percent) in women who had reconstruction using implants and a contralateral reduction mammoplasty (57 percent) in women who had autologous tissue reconstruction.

In a similar review, Giacalone et al. have reported on 683 women over a 17-year period that had delayed reconstruction only.¹¹ The reconstructions included a transverse rectus abdominis musculocutaneous flap in 212 women, a latissimus dorsi flap in 167 women, or an implant in 304 women. Contralateral symmetry procedures were performed in 33.5 percent of transverse rectus abdominis musculocutaneous reconstructions, 37.8 percent of latissimus dorsi reconstructions, and 27.6 percent of implant reconstructions. These included reduction mammoplasty in 101 women, mastopexy in 154 women, or implant augmentation in 88 women. Thus, 50 percent (343 of 683) of women required a contralateral secondary procedure to achieve symmetry.

The results of this study have demonstrated that ipsilateral procedures are more common than contralateral procedures to obtain symmetry. The percentage of women that required secondary procedures of the contralateral breast was 10.5 percent compared with 42 per-

cent for the ipsilateral breast. This is in sharp contrast to previous studies at other institutions in which secondary procedures involving the contralateral breast were necessary in more than 50 percent of women.^{10,11} This may reflect the fact that with the current technique of free tissue transfer and the delay procedure for the traditional pedicle transverse rectus abdominis musculocutaneous flap, larger volumes of skin and fat can be transplanted to achieve initial volume symmetry, thus reducing the frequency of secondary procedures on the contralateral breast. Secondary procedures can then be performed on the ipsilateral breast to improve the final volume and contour symmetry.

The results also demonstrate that secondary procedures are more common following breast reconstruction with autologous tissue than with implants. This is a reflection of the fact that autologous tissue is more amenable than implants to secondary procedures. Secondary procedures on autologous tissue can include ipsilateral skin and fat excision, ipsilateral or contralateral implant augmentation, and contralateral reduction mammoplasty or mastopexy; whereas the options for secondary procedures following implant reconstruction are generally fewer, including ipsilateral implant exchange or contralateral reduction mammoplasty or mastopexy.

The incidence of secondary procedures was higher for women who had delayed reconstruction compared with immediate reconstruction. This is not an unexpected finding because it is generally more difficult to reconstruct a breast with natural contour in the delayed setting. This is primarily due to the effects of scar tissue that obliterates the normal anatomy of the inframammary fold. When using autologous tissue, the mastectomy skin flap below the mastectomy incision is elevated and partially excised or incised to allow for natural breast ptosis. A flap with sufficient quantity of skin and fat is positioned on the chest wall to create the natural contour. When using implants, secondary procedures are more common in the unilateral setting compared with the bilateral setting. It is more difficult to obtain initial and final contour symmetry without performing secondary procedures.

CONCLUSIONS

The results of this analysis have demonstrated that breast reconstruction with autologous tissue is more likely to result in final symmetry with

regard to volume and contour when compared with implants. Secondary procedures involve the ipsilateral breast to a greater extent than the contralateral breast. Delayed reconstruction results in a higher percentage of women who require secondary procedures.

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