

Managing the Opposite Breast: Contralateral Symmetry Procedures

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Abstract: The importance of symmetry after unilateral breast reconstruction is becoming increasingly realized and important. As our reconstructive options have increased and our technical abilities have improved, the expectations of women with breast cancer have been enhanced by virtue of the fact that we are often able to reconstruct a breast with natural volume and contour. When embarking on a unilateral breast reconstruction, the plastic surgeon has several goals and one of which is to obtain breast symmetry. In many circumstances, breast symmetry is achieved without operating on the contralateral breast; however, in some cases, a contralateral operation will be necessary. This is usually based on the volume, contour, and position of the natural and reconstructed breast. Often, the need and/or desire for a contralateral procedure will be evident during the initial consultation. Otherwise, the need for a contralateral procedure will not be evident until after the primary reconstruction has been completed. In either case, it is important for plastic surgeons to be aware of the incidence of these procedures and the options available to them.

Key Words: breast reconstruction, contralateral breast, reduction mammoplasty, implant augmentation, mastopexy, breast cancer surveillance

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The purpose of this manuscript is to review the reconstructive options for the contralateral breast in the setting of unilateral mastectomy and reconstruction. The data analysis will be based on the authors experience over an 11 year period performing unilateral breast reconstruction with autologous tissue and prosthetic devices. The specific comparisons will include autologous versus prosthetic reconstruction, and immediate versus delayed reconstruction. The discussion will review relevant oncologic and reconstructive principles, and concepts that will facilitate ones' ability to operate on the contralateral breast.

METHODS

During the time interval spanning from July 1, 1997 to September 30, 2007, a review of all breast reconstructions performed by the primary author was reviewed. The data was collected from a prospectively maintained database of all women who have had breast reconstruction performed by the primary author. A total of 945 women had breast reconstruction following mastectomy of which 280 (29.6%) were bilateral and 665 (70.4%) were unilateral. The methodology will focus on the unilateral reconstructions as these were the women in whom a contralateral procedure would be potentially necessary. Of the 665 women who had a unilateral mastectomy, the type of reconstruction included autologous tissues in 457 women (68.7%) and prosthetic devices in 208 women (31.3%). The reconstruction occurred immediately at the time of the mastectomy in 430 women (64.7%) and was delayed in 235 women (35.3%). The mean age was 49.6 years for all the women in the study (range, 17–82). The autologous techniques included a deep inferior epigastric perforator (DIEP) flap in 210 women (46%), free transverse rectus abdominis musculocutaneous (TRAM) flap in 149 (32.6%), latissimus dorsi flap in 43 (9.4%), pedicle TRAM flap in 39 (8.5%), and an superior gluteal artery perforator (SGAP) flap in 16 (3.5%). The prosthetic techniques included a two-stage reconstruction using tissue expanders and implants in 206 women (99%) and a single stage reconstruction using permanent implants in 2 women (1%). Minimum follow-up for inclusion was 6 months. Mean follow-up was 42 months (range, 6 months–10 years).

It is important for plastic surgeons to mention during the initial consultation that a symmetry procedure of the opposite breast may be needed. Some surgeons will address these issues at the time of the initial mastectomy and reconstruction and perform the contralateral operation simultaneously.^{1,2} However, it is this authors practice to perform the contralateral operations on a delayed basis to allow for the reconstructed breast to settle and assume a final contour. In this setting, the contralateral breast can be addressed more precisely.

After the primary breast reconstruction, discussions related to symmetry, the ipsilateral breast, and the contralateral breast are addressed. Decisions are made based upon the patients expectations regarding breast volume, contour, and position. The revisional procedures can include the ipsilateral breast, contralateral breast, or both. The indications for symmetry procedures are varied and generally depend upon whether a partial or total mastectomy had been performed.

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TABLE 1. A Comparison Summary of Ipsilateral and Contralateral Symmetry Procedures After Unilateral Breast Reconstruction

Demographics			Ipsilateral		Contralateral					Both
	Women	Mean Age	Revision	No Revision	Mastopexy	Reduction	Implant	Mastectomy	No Revision	
Immediate	430	49.5	115 (26.7%)	315 (73.3%)	18 (4.2%)	28 (6.5%)	7 (1.6%)	1 (0.2%)	376 (87.4%)	35 (8.1%)
Delayed	235	49.7	79 (33.6%)	156 (66.4%)	19 (8.1%)	29 (12.3%)	8 (3.4%)	1 (4.3%)	178 (75.7%)	32 (13.6%)
Autologous	457	49.8	159 (34.8%)	298 (65.2%)	27 (5.9%)	44 (9.6%)	6 (1.3%)	0	380 (83.2%)	51 (11.2%)
Prosthetic	208	49	35 (16.8%)	173 (83.2%)	10 (4.8%)	13 (6.3%)	9 (4.3%)	2 (1%)	174 (83.7%)	16 (7.7%)

Most women in whom a contralateral symmetry procedure is necessary have had a total mastectomy with reconstruction. These women were included in this review. The contralateral operations included a reduction mammoplasty, mastopexy, prosthetic augmentation, and prophylactic mastectomy. The ipsilateral operations included skin and fat contouring, inframammary and lateral mammary fold procedures, and implant augmentation. Specific details regarding the technical aspects are not reviewed in this manuscript as they are generally well-known and can be obtained elsewhere. These operations were always performed after the initial reconstruction rather than concurrent. Before surgery, all women had a physical examination and a mammogram of the contralateral breast to rule out any palpable and radiologic abnormalities.

RESULTS

Of the 665 women who had unilateral breast reconstruction, an ipsilateral operation for symmetry purposes was performed in 194 (29.2%) and a contralateral operation was performed in 111 women (16.7%). The specific contralateral operations included a reduction mammoplasty in 57 women, a mastopexy in 37 women, implant augmentation in 15 women, and a prophylactic mastectomy and reconstruction in 2 women. Of the total number of women who had a secondary operation, 67 had both an ipsilateral and contralateral procedure. Table 1 categorizes the specific contralateral op-

erations for the 2 groups being compared that include the autologous versus prosthetic, and the immediate versus delayed. Figures 1–4 illustrate case examples of women after unilateral reconstruction and contralateral symmetry procedures. These include DIEP flap and contralateral mastopexy (Fig. 1), free TRAM flap and contralateral reduction mammoplasty (Fig. 2), prosthetic reconstruction and contralateral implant augmentation (Fig. 3), and prosthetic reconstruction and contralateral reduction mammoplasty (Fig. 4).

These results demonstrate that ipsilateral procedures are more commonly performed than contralateral procedures in the setting of autologous reconstruction (34.8% vs. 16.8%), delayed reconstruction (33.6% vs. 24.3%), and immediate reconstruction (23.3% vs. 12.6%) but are nearly equivalent in the setting of prosthetic reconstruction (16.8% vs. 16.3%). Contralateral procedures occur with greater frequency after delayed reconstruction (24.3%) and are followed by autologous (16.8%), prosthetic (16.3%), and immediate reconstruction (12.6%). The most common contralateral procedures included reduction mammoplasty (8.6%) followed by mastopexy (5.6%), and implant augmentation (2.3%). In two women (0.3%), a contralateral mastectomy was performed followed by a reconstruction.

DISCUSSION

Women with unilateral breast cancer pose unique surgical challenges to the reconstructive surgeon. There are

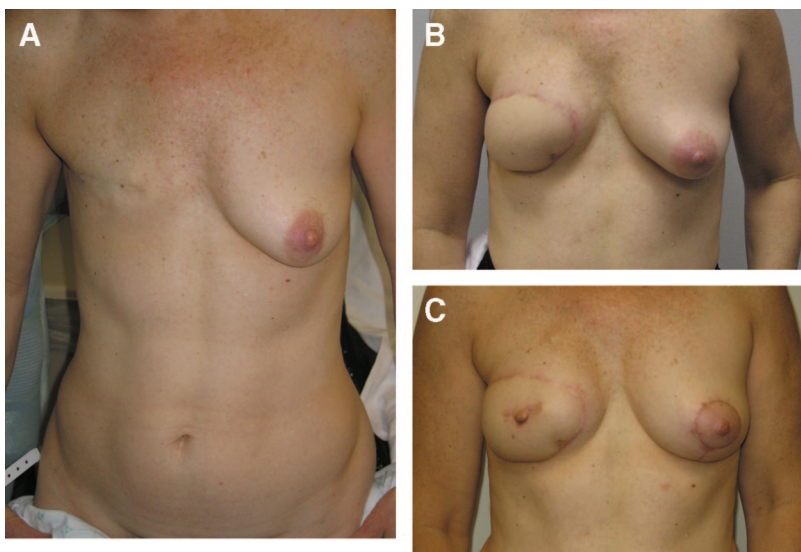


FIGURE 1. (A) Preoperative view demonstrating right mastectomy site. (B) Postoperative view after delayed right breast reconstruction with a DIEP flap. There is a mild degree of contralateral breast ptosis. (C) Postoperative view after contralateral mastopexy and right nipple reconstruction demonstrating ideal symmetry.



FIGURE 2. (A) Preoperative view demonstrative breast asymmetry. (B) Postoperative view after immediate right breast reconstruction with a free TRAM flap. There is marked breast asymmetry secondary to contralateral mammary hypertrophy. (C) Postoperative view after contralateral reduction mammoplasty and right nipple reconstruction demonstrating ideal symmetry.

several important decisions that a woman must make when contemplating tumor extirpation. Many women with unilateral breast cancer are considered suitable candidates for partial mastectomy; whereas, others are better candidates for a total mastectomy. Most women will have a unilateral operation; however, the incidence of bilateral procedures has been increasing. The topic of breast reconstruction after partial or total mastectomy is being addressed with increasing frequency. A consultation with a plastic and reconstructive surgeon has become an integral part of the breast cancer treatment program at many institutions. Plastic surgeons are now able to offer a wide variety of reconstructive options to restore a woman's physical attributes and maintain body image, self-esteem, and self-confidence. These reconstructive options include the use of autologous tissues and use of prosthetic devices. Each of these options can result in a

beautifully shaped and contoured breast. The challenge for the plastic surgeon is to be able to match the opposite breast.

Many women after unilateral breast reconstruction will have volume, contour, and/or positional symmetry; however, in others, asymmetries may occur and secondary symmetry procedures may be necessary to correct them. Often, these asymmetries are because of the reconstructed breast, and are correctable by revising it. Other times however, the asymmetry may not be amenable to a ipsilateral revision, and a contralateral procedure may be needed. The types of asymmetries most commonly encountered can be classified as those related to contour, volume, and position. Contour asymmetries include discrepancies in medial or lateral fullness, and displacement of the nipple areolar complex. Volume asymmetry refers primarily to breast size. Positional asymmetry refers to discrepancies in the position of the inframam-

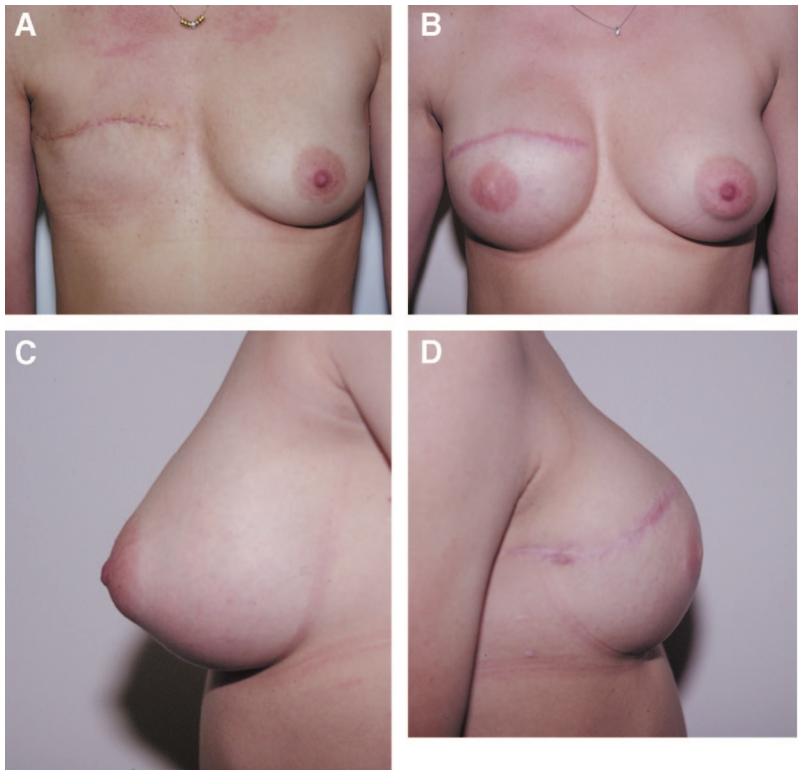


FIGURE 3. (A) Preoperative view after right mastectomy. (B) Final postoperative view demonstrating right prosthetic reconstruction and contralateral implant augmentation demonstrating ideal symmetry. (C) Lateral view of contralateral implant augmentation. (D) Lateral view of right prosthetic reconstruction.

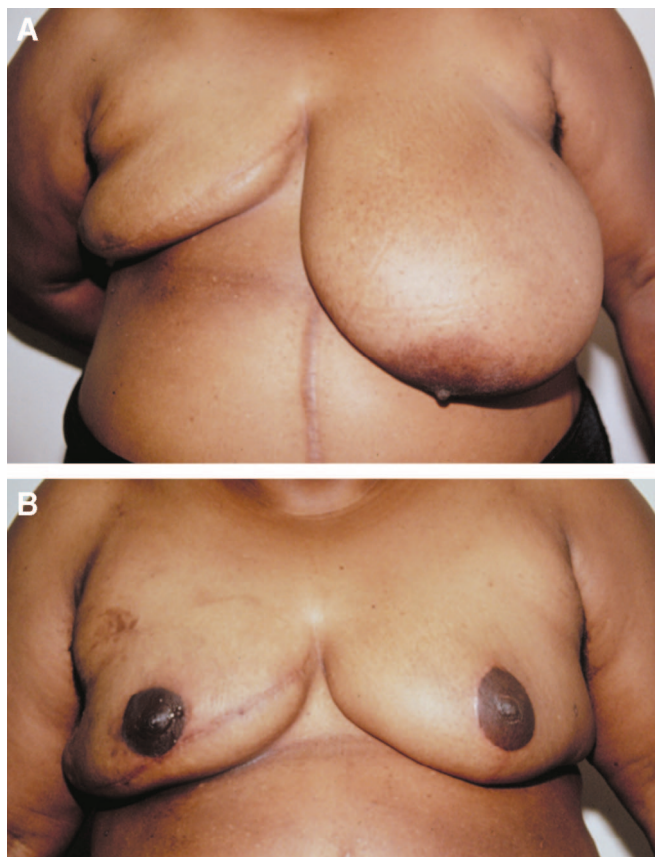


FIGURE 4. (A) Preoperative view after right mastectomy and severe contralateral mammary hypertrophy. (B) Postoperative view after prosthetic reconstruction and contralateral reduction mammoplasty demonstrating improved symmetry.

mary fold, lateral mammary fold, or location of the breast mound on the chest wall. The operations to correct these asymmetries are varied and may involve the ipsilateral breast and the contralateral breast.

When considering contralateral breast operations, there are several important factors that the surgeon should be aware of that are related to oncologic risks, hereditary features, postoperative surveillance, and patient expectations.³⁻⁶ Although breast cancer is frequently thought of as a focal process, it should be appreciated that there is a systemic component to this disease and that in some cases the contralateral breast may also harbor malignant or premalignant cells. Therefore, when discussing the possibility of performing contralateral breast surgery, several important caveats warrant mentioning. The first is that abnormal cells may exist or evolve in the contralateral breast. It has been demonstrated that the 10-year cumulative risk of developing a contralateral breast cancer in women who were initially diagnosed with unilateral disease is 6% to 7%⁷⁻⁹ and that the 20 year incidence is 9%.¹⁰ Various predictors of contralateral breast cancer have been studied. Cook et al¹¹ have demonstrated that surgical menopause (bilateral oophorectomy) reduced the incidence of contralateral breast cancer when compared with premenopausal women. This observation was not appreciated

when comparing postmenopausal women with premenopausal women. Among postmenopausal women, factors that were associated with an increased risk of contralateral breast cancer included having more than 2 children and a family history of breast cancer. Interestingly, a lobular component was not associated with increased risk contrary to classic teaching. Taking these facts into consideration, Rubidoux et al¹² has performed contralateral breast biopsies in 237 women with unilateral breast cancer and revealed occult malignancy, invasive lobular carcinoma, ductal carcinoma in situ (DCIS), or high risk benign disease in 70.9% of the biopsied breasts ($P < 0.01$). This was in contrast to breast findings in women with no history of breast cancer. Thus, it is important to appreciate that the contralateral breast may be a harbinger of cellular atypia or malignancy.

It is clear that the risk of contralateral breast cancer is relatively small but is real. It is said that, there are important considerations related to its occurrence and prognosis. In a review of 4554 women with breast cancer managed at the MD Anderson Cancer Center, 142 women were demonstrated to develop contralateral breast cancer (3.1%).¹³ In the majority of cases, the contralateral breast cancer was synchronous (within 4 months of the initial diagnosis) and occurred in 61.3% of women; whereas, a metachronous breast cancer (greater than 4 months from the initial diagnosis) occurred in 38.7%. Others have studied prognostic factors associated with metachronous breast cancer and demonstrated that younger women (<45-year-old) and women with lobular histology located in the central or inner quadrants were at increased risk of developing contralateral breast cancer.^{8,14,15} Women with lobular carcinoma in situ (LCIS) histology are 2.6 times more likely to develop contralateral breast cancer than women with DCIS histology.⁹ The role of estrogen and progesterone was mixed with estrogens having a protective role in younger women and an associated role in older women.¹⁴ Progesterone on the other hand was associated more with contralateral ductal carcinomas and less with lobular.¹⁴ Chang et al¹⁶ have evaluated 469 women with unilateral breast cancer of which 18 (4%) later developed contralateral breast cancer. Management included breast conservation in 2 women, mastectomy without reconstruction in 4, and mastectomy with reconstruction in 12. Symmetry was achieved more often when the method of reconstruction was similar for both breasts. Of the 18 women who developed contralateral breast cancer, 89% were free of tumor at mean follow-up of 5 years (range, 1-9 years).

Once the decision to perform a contralateral symmetry procedure has been made, the plastic surgeon has several options. In majority of situations, the operation will involve a reduction or augmentation mammoplasty. Previous studies have demonstrated a wide range in the incidence of these options. Losken et al¹⁷ have reviewed the incidence of contralateral procedures spanning a 25 year interval (1975-1999) that included 1394 women after unilateral mastectomy and reconstruction. A contralateral procedure was performed in 67% of delayed reconstructions and in 22% of immediate reconstructions. Prosthetic reconstruction resulted in a higher incidence of contralateral operations (89% delayed and 57%

immediate) compared with TRAM flap reconstruction (59% delayed and 18% immediate). Reduction mammoplasty was the most common operation after autologous reconstruction (57%) and augmentation mammoplasty was the most common operation after prosthetic reconstruction (41%). In a more recent study, Nahabedian et al¹⁸, have reviewed the incidence of secondary operations spanning a 5 year interval (1998–2002) that included 382 women. A contralateral operation was performed in 20% of women that included a reduction mammoplasty in 46%, a mastopexy in 43%, and implant augmentation in 11%. Secondary operations were performed in 59% of women after autologous reconstruction and in 39% of women after prosthetic reconstruction. There are several reasons for the discrepancy between the 2 studies. The first is that in the Nahabedian study the percentage of women having ipsilateral operations was 80%. This is most likely because most of the autologous reconstruction was in the form of a free tissue transfer; whereas, with the Losken study, most of the autologous reconstructions were with a pedicle TRAM flap. It is generally accepted that larger volumes of tissue are transferable after microvascular breast reconstruction increasing ones' ability to achieve volume symmetry, and allowing for minor ipsilateral revisions to achieve contour and positional symmetry.

Surveillance of the contralateral breast after a symmetry procedure is important because of the increased risk of contralateral breast cancer associated with the original tumor. Complicating this is the postoperative nature of the breast. After breast surgery, architectural distortions typically occur and some degree of fat necrosis or microcalcifications are typically observed. There are several options for surveillance after contralateral breast surgery that include physical examination, mammography, ultrasound, and MRI.¹⁹ Each of these options are useful depending on the type of contralateral procedure performed. Surveillance after reduction mammoplasty, implant augmentation, and mastopexy is typically recommended 6 months after the procedure. After 6 months, the local tissues have generally returned to normal with resolution of edema and inflammation. Physical examination will often detect soft tissue masses that may represent tumor, fat necrosis, or cystic change. Ultrasound is useful for differentiating solid from cystic change. Mammography will demonstrate areas of microcalcification and abnormal parenchymal masses. MRI will provide detailed architecture of the breast and surrounding structures.

The breast and parenchymal changes after these contralateral breast procedures warrant discussion. After reduction mammoplasty, several mammographic changes are observed. These include skin thickening, retraction of the lower pole of the breast, transposition of the breast parenchyma, and elevated nipple position.²⁰ After implant augmentation, specialized techniques are necessary to optimally visualize the breast parenchyma. The amount of breast parenchyma visualized will depend upon implant location (submuscular vs. subglandular augmentation) and the type of imaging performed (compression vs. displacement mammography). Silverstein has demonstrated a 49% reduction in visualization using compression mammography for subglandular implants

and a 9% reduction using displacement mammography for submuscular implants.²¹ Other factors that can influence visualization include degree of capsular contracture, breast size, and implant size.²²

Future trends that may assist the surgeon in obtaining symmetry after unilateral breast reconstruction include the use of 3-dimensional imaging of the reconstructed and natural breast.^{23–25} With these techniques, exact breast volumes can be calculated, and used to determine the amount of breast augmentation or reduction that is necessary. The information can be used to modify the ipsilateral or contralateral breast. Current limitations of this technique are related to variability in measurements, mammary hypertrophy, and cost.

In conclusion, the importance of breast symmetry after mastectomy and reconstruction is becoming increasingly appreciated. Operations of the contralateral breast are an important vehicle that will often facilitate our ability to achieve symmetry. Knowledge of risk factors associated with contralateral breast surgery is useful for patients and surgeons. Reduction mammoplasty is the most common of these operations followed by implant augmentation and mastopexy. Postoperative surveillance using physical examination, mammography, ultrasound, and MRI will ensure safety and efficacy. Finally, one of our goals as plastic surgeons is to facilitate the transition from a cancer victim to a cancer survivor. The ability to meet patient expectations and provide good outcomes should not be underestimated in this quest.

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