

Optimizing Symmetry after Unilateral Mastectomy and Reconstruction with a Less Form-stable Prepectoral Implant

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Summary: Implant-based breast reconstruction after bilateral mastectomy allows for excellent symmetry between the reconstructed breasts. After unilateral mastectomy, it is difficult to achieve symmetry between the reconstructed and native breast. In the past, anatomical implants provided a reconstruction that more closely resembled the shape of a native breast compared with the cohesive, round subpectoral implants commonly placed today. Here, we describe the use of a less form-stable round implant placed in the prepectoral plane after mastectomy which provides improved symmetry with the contralateral native breast. (*Plast Reconstr Surg Glob Open* 2021;9:e3990; doi: [10.1097/GOX.0000000000003990](https://doi.org/10.1097/GOX.0000000000003990); Published online 15 December 2021.)

INTRODUCTION

Women often choose bilateral mastectomy for unilateral cancers to optimize symmetry.¹ They choose to undergo prophylactic mastectomy despite recommendations against routine performance of such surgery by the American Society of Breast Surgeons.² It is therefore important for surgeons to provide patients the opportunity for excellent symmetry after unilateral mastectomy.

In the past, textured anatomical implants were used after mastectomy to provide patients with reconstructions that better mimicked a natural breast.³ Recently, textured implants have been linked to anaplastic large cell lymphoma, which led to an implant recall (Allergan Corporation, Dublin, Ireland) and reduced the use of these implants, in general.⁴ As such, many surgeons use only round, smooth implants, limiting their ability to obtain symmetry without placing an implant in the contralateral breast.⁵

Recent innovations have led to more cohesive, form-stable round implants that reduce rippling but provide significant upper pole fullness that is not usually present in the native breast. Less cohesive implants contain more liquid silicone, which tends to settle in the lower pole in the upright position, better mimicking a natural breast

shape.⁶ In addition, subpectoral implant placement after mastectomy, which is most commonly performed today, results in a superiorly and laterally displaced reconstruction in relation to the natural ptosis of the contralateral breast.⁷ Prepectoral reconstructions, however, tend to descend and stretch the lower pole skin, creating a more natural reconstructed unit of skin, acellular dermal matrix (ADM), and implant.⁷ We reasoned that by combining the least form-stable, smooth, round silicone implants available with prepectoral implant placement, we could reconstruct a breast that better mimicked the contralateral native breast without resorting to contralateral augmentation.

METHODS

This study was approved by the Gwinnett Surgical Ambulatory Surgery Center/Northside Hospital Institutional Review Board (Lawrenceville, Ga.) and approved as a nonsignificant risk study. Patients with breast cancer underwent immediate prepectoral direct-to-implant reconstruction (DTIR) with ADM after nipple-sparing mastectomy (NSM), skin-sparing mastectomy (SSM), or Wise-pattern mastectomy (WPM). Inframammary incisions were used unless the nipple resection, or a WPM was planned. We used the Mentor (Santa Barbara, Calif.) Memory Gel implants (Cohesive I gel) because these have been demonstrated to have the lowest form stability⁸ with an ex vivo ADM wrap technique. Jewell et al⁸ further demonstrated that

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Allergan Inspira smooth, cohesive implants (Truform 3 gel) were the most form-stable smooth, round prosthetics, followed by Motiva (Alajuela, Costa Rica) implants containing ProgressiveGel Plus, followed by Sientra (Santa Barbara, Calif.) implants containing High-Strength Cohesive Plus gel. Allergan Inspira smooth responsive implants (Truform 1 gel) were softer, less stiff, and less cohesive than Mentor Cohesive I gel and Sientra High strength cohesive gels, but more form-stable.⁸ Patients who had WPM underwent simultaneous contralateral inferior pedicle reduction/mastopexy.

RESULTS

NSM (Figs. 1, 2), SSM, and WPM (Figs. 3, 4) were performed in nine, one, and five women, respectively, with immediate prepectoral DTIR with ADM with at least 6 months follow-up. (See table, Supplemental Digital Content 1, which shows patient demographics, operative details, and complications. <http://links.lww.com/PRSGO/B862>.) The mean age was 54.7 years (range, 29–77 years), and mean BMI was 29.5 kg/m² (range, 22.7–36.7 kg/m²). The mean operative time was 69.7 minutes (range, 45–82 minutes) and 177.6 minutes (range, 149–237 minutes) for NSM/SSM and WPM, respectively. The mean implant size was 453 ml (range, 210–755 ml). Five patients required adjuvant radiotherapy. One patient who underwent NSM required return to the operating room for hematoma drainage with implant salvage. One patient who underwent WPM had delayed healing, which resolved after 6 weeks of wound care. Two patients who underwent NSM were elected for a revision with fat transfer in a second surgery. (See table, Supplemental Digital Content 1. <http://links.lww.com/PRSGO/B862>.)



Fig. 1. Preoperative photograph of a 44-year-old woman requiring left mastectomy for multicentric ductal carcinoma in situ.

Takeaways

Question: After unilateral mastectomy, how can we reconstruct the breast with an implant to obtain optimal symmetry with the native, contralateral breast?

Findings: The use of the least form-stable, commercially available implants placed in the prepectoral plane gives us excellent symmetry with the contralateral breast.

Meaning: Patients with breast cancer who require or desire unilateral mastectomy and implant-based reconstruction do not have to undergo contralateral mastectomy and reconstruction or augmentation to obtain good symmetry with their reconstructed breast.

DISCUSSION

The majority of postmastectomy breast reconstruction utilizes a prosthetic approach. Although not recommended for most women with unilateral breast cancer without an inherited predisposition, many choose to undergo prophylactic mastectomy to optimize symmetry because it is difficult to match an implant reconstruction with the contralateral breast. The natural ptosis of the breast is difficult to recreate with round, cohesive subpectoral implants, which is the most common type of prosthetic and breast reconstruction approach used today. This approach tends to produce reconstructed breasts with exaggerated upper pole fullness at the expense of a less well-developed lower pole, the exact antithesis of a natural breast that has aged and developed ptosis. Although highly cohesive, round implants do assume an anatomical shape in the upright position, less cohesive implants are less form-stable and lose more of their



Fig. 2. Photograph at 6 months postoperative, demonstrated after NSM and DTIR with a Moderate Profile Mentor Cohesive I gel implant with anterior ADM cover in the prepectoral plane.



Fig. 3. Preoperative photograph of a 66-year-old woman with extensive left breast cancer involving the nipple requiring mastectomy.

height and upper pole depth, gaining more projection in their lower poles secondary to the effects of gravity on the less cohesive gel⁸ (Fig. 1). (See figure, Supplemental Digital Content 2. <http://links.lww.com/PRSGO/B863>.) We feel that although this may not uniformly be the most appropriate implant for a woman with breast cancer undergoing unilateral mastectomy and reconstruction (some older women have minimal ptosis and have upper pole fullness and some very young women develop breast cancer), we feel it is typically the most useful implant for the average middle-aged woman with breast cancer who refuses contralateral augmentation or an anatomical implant. (See figure, Supplemental Digital Content 2. <http://links.lww.com/PRSGO/B863>).

While cohesive, textured anatomic implants may give us the best symmetry with the contralateral breast,¹ anaplastic large cell lymphoma concerns have decreased their use.⁴ We therefore reasoned that the least form-stable, smooth round implants might better assume the shape of an anatomical implant in the upright position, as previously demonstrated.⁶ In addition, we felt that the prepectoral location might give us better symmetry with the native breast. The native breast is located in the prepectoral plane, and it is obvious that it would be more challenging to obtain symmetry by reconstructing a breast with a subpectoral implant. Subpectoral implants are held up by the muscle, are subject to animation deformity, and are often displaced superiorly and laterally, whereas prepectoral implants fill the skin envelope as a natural breast would.⁷ Prepectoral implants become more ptotic with time, filling out the lower pole, with their position often dictated by the integrity of the mastectomy flap and ADM providing a more natural result.

Although less form-stable prepectoral implants may better mimic the shape of a natural breast, they are prone to rippling. This may make subsequent sessions of fat transfer to optimize the final result. We made certain to



Fig. 4. One-month postoperative photograph shown after left WPM and DT IR with a Moderate Plus Profile Cohesive I gel implant with anterior ADM cover in the prepectoral plane. The patient also underwent an immediate nipple and areolar reconstruction with contralateral inferior pedicle Wise-pattern reduction. The breasts have excellent symmetry, and it is difficult to discern which side is the implant reconstruction and which side is the mammoplasty. We believe the use of less form-stable implants in the prepectoral plane gives the best symmetry with the contralateral native breast in the average middle-aged woman who develops breast cancer. In addition, using the same Wise-pattern skin incision on both sides optimizes symmetry as well.

preserve the upper pole subcutaneous tissues by adhering to the “oncologic plane”⁹ to minimize the chances of rippling and the need for secondary lipofilling. We also acknowledge the importance of using same skin incision on the final breast shape. In rare instances, we perform an SSM, and we inform the patient that immediate skin replacement is likely far more important to the final breast shape and symmetry than the cohesivity of the breast implant used.

CONCLUSIONS

It is challenging to reconstruct a breast with an implant that has symmetry with the contralateral breast. This is even more difficult without the use of anatomical implants. We have found that by preserving the oncologic plane and using a less form-stable, round implant in the prepectoral plane, we can reconstruct a breast with excellent symmetry to the contralateral breast with infrequent need for secondary lipofilling sessions.

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