TRAM Revisions and Contralateral Mammoplasties: The Role of “Mirror Image” Skin Patterns

Richard J. Restifo, M.D.¹

ABSTRACT

Symmetry is the *sine qua non* of breast reconstruction. A symmetrical result offers peace of mind, a healthy body image, and improved self-esteem to the patient and presents a sometimes elusive goal to the plastic surgeon. When symmetry comes with modest effort we are pleased, but more often the effort is prolonged through several operations over a period of time. This article addresses the management of both the reconstructed breast mound(s) as well as the contralateral breast at different stages of the reconstruction process. By approaching the reconstructed breast mound(s) and a remaining native breast as similar soft tissue structures with similar soft tissue envelopes, it may be possible to maximize the symmetry of the final result.

KEYWORDS: Breast reconstruction, mammoplasty, symmetry

Both patient and surgeon are fortunate in those situations where skin-sparing mastectomy¹ and immediate reconstruction achieve symmetry of the breast mound in one operation (Fig. 1). However, it is more common that a good match is not obtained due to technical or artistic factors that cannot be overcome in the immediate setting or in a single stage. This fact underlies the utility of secondary revisions to the reconstructed breast mound. Another scenario is when a match to a very large or ptotic contralateral breast is not even *desirable*; contralateral reduction or mastopexy will be necessary. If neither native breast represents a reasonable aesthetic goal for the reconstruction, it is possible that both skin envelopes will benefit from modification, and ideally “mirror-image” skin envelope modifications can be performed on both sides. Because the skin envelope is an obvious factor in the determination of breast shape, this will add to the potential for symmetry of shape and scar pattern. Thus the use of these concepts—contralateral surgery, breast mound revisions, and mirror-image

skin patterns—will maximize symmetry and aesthetic outcome.

CONTRALATERAL SURGERY

The most common symmetry operation following autologous tissue reconstruction is the contralateral reduction or mastopexy.² When a large-breasted woman seeks transverse rectus abdominis myocutaneous (TRAM) flap reconstruction, it may be unwise or difficult to attempt reconstruction with a very large TRAM flap; contralateral reduction to match a smaller TRAM flap may be far more appropriate (Figs. 2, 3). The reduction and TRAM flap may be performed simultaneously and with good outcome,³ although when the reduction is done at the subsequent operation, the excess areola or breast skin may be used for nipple-areolar reconstruction.⁴

Another very common problem is the ptotic patient who chooses expander-implant reconstruction. As it may prove impossible to achieve ptosis with an

New Trends in Reduction and Mastopexy; Editor in Chief, Saleh M. Shenaq, M.D.; Guest Editors, Scott L. Spear, M.D., F.A.C.S. and Steven P. Davison, M.D., D.D.S., F.A.C.S. *Seminars in Plastic Surgery*, Volume 18, Number 3, 2004. Address for correspondence and reprint requests: Richard J. Restifo, M.D., 59 Elm Street, Suite 560, New Haven, CT 06510. ¹Yale New Haven Hospital, New Haven, CT. Copyright © 2004 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001 USA. Tel: +1(212) 584-4662. 1535-2188,p;2004,18,03, 245,253,ftx,en;sps00131x.

Figure 1 Skin-sparing mastectomy and immediate TRAM flap breast reconstruction with subsequent nipple-areolar reconstruction.

implant, mastopexy of the contralateral breast is more likely to achieve the desired symmetry (Fig. 4). The mastopexy is best performed at the time of expander-to-implant exchange or even at a third operation; this offers a stable and settled breast mound against which to attempt a match by mammoplasty. As in a reduction, excess breast or areolar skin can be used for contralateral nipple-areolar reconstruction.

SECONDARY SHAPING OF THE BREAST MOUND

When the contralateral breast represents a good aesthetic goal or if the patient desires no alteration of the noncancerous breast, reshaping efforts are directed at the reconstructed breast mound. The sensible tendency at the initial reconstruction is to overreplace TRAM flap

A

B

Figure 2 TRAM flap/contralateral breast reduction.

A

B

Figure 3 TRAM flap/ contralateral breast reduction.

Figure 4 Implant reconstruction/contralateral mastopexy.

volume and/or skin, resulting in a larger and/or more ptotic TRAM flap than the contralateral breast. Fortunately the well-healed TRAM flap has an abundant vascularity by virtue of the rectus pedicle and peripheral

vascular ingrowth, allowing extensive modifications to the breast mound. The TRAM flap breast mound can be manipulated in a manner similar to the native breast by reduction of the skin paddle and adipose content, with

A

B

C

D

Figure 5 Revision of TRAM flap; nipple reconstruction.

E

F

Figure 5 (continued)

A

B

Figure 6 Revision of TRAM flap; nipple reconstruction.

remobilization of the tissue into the appropriate size and shape. Skin alone or skin and fat can be removed (Figs. 5–8).

Secondary shaping of the TRAM flaps can be accomplished with mammaplasty skin patterns (“TRAM-

plasty”). This is especially appropriate if the original mastectomies were done in a vertical orientation (see below). These revisions are done to improve shape or symmetry, correct upper pole contour deficiencies, or improve the scar patterns. The technique of TRAMplasty

A

B

Figure 7 Revision of bilateral TRAM flaps; bilateral nipple reconstruction.

Figure 8 Revision of bilateral TRAM flaps; bilateral nipple reconstruction.

Figure 9 Bilateral TRAMplasty and subsequent nipple-areolar reconstruction.

is analogous to a mammoplasty of a native breast (Figs. 9, 10). This is possible because a well-healed TRAM flap has an extensive blood supply, not only from the inferior rectus pedicle but also with abundant secondary vascular ingrowth from the periphery. Because of the similarities in blood supply, TRAMplasty operative maneuvers mimic mammoplasty maneuvers. Skin envelope alterations are designed, often reducing the TRAM flap skin paddle by de-epithelialization to the size of the areola. The native breast skin is then elevated off the TRAM flap, creating a central mound that is resected, mobilized, and transposed as if it were native

breast parenchyma. The skin is closed in a vertical or an inverted T, with inset of the areola. The technique of the "tailor-tacking" is useful to appropriately trim the skin and thus shape the breast at the lower pole. Conceptually, TRAMplasty and mammoplasty are very similar operations.

The TRAMplasty also provides an opportunity for simultaneous nipple-areolar reconstruction (Fig. 10). A nipple is reconstructed at the center of a small TRAM flap skin paddle using trilobed or other small local flaps. After the inset of the nipple flaps, the TRAM flap skin paddle is reduced to the size of a 42-mm cookie cutter.

Figure 10 TRAMplasty and simultaneous nipple-areolar reconstruction.

This tissue construct has been referred to as a “peg” flap.⁵ It is important to perform the nipple flaps before creating the areola from the TRAM flap skin paddle because the harvesting of the nipple flaps will distort the round skin island. The nipple flaps and round areolar skin island are then transposed to the appropriate position and the skin closed in a vertical fashion at the lower pole.

MAMMAPLASTY-PATTERN MASTECTOMIES

It may be possible to initiate or anticipate the eventual skin envelope configuration at the time of mastectomy by designing a skin-sparing mastectomy after a planned contralateral mammaplasty pattern, either the vertical⁶ or an inverted T pattern.⁴ An obvious consideration, as in all skin-sparing mastectomies, is the vascularity of the mastectomy flaps. Robust circulation will be required if the skin flaps are to be called upon to contribute to the shape of the breast mound. A vertically oriented mastectomy leads to skin flaps that are, in my opinion, at least as viable as the more traditional transverse mastectomy skin flaps. If an inverted T mastectomy flap pattern is indicated, it is wise to de-epithelialize along the inframammary fold to avoid the decreased circulation that may occur at the trifurcation mastectomy skin flap if the inverted T mastectomy pattern is cut full thickness. At a subsequent stage, the mirror-image contralateral mammaplasty is performed in the chosen pat-

Figure 11 Mirror-image skin patterns: right reduction, left TRAM flap. Skin-sparing mastectomy of left breast performed within the confines of an inverted T mammaplasty pattern, similar to the pattern used for the right-sided reduction mammaplasty.

tern. At this time, tissue from the reduction/mastopexy may be used for nipple reconstruction. In the ideal circumstance, the reconstruction achieves the appearance of a bilateral mammaplasty as opposed to a reconstruction (Figs. 11, 12). Although mammaplasty pattern skin-sparing mastectomy is most appropriate for TRAM flaps, the concept may apply to expander-implant reconstruction as well (Fig. 13).

A

B

Figure 12 Mirror-image skin patterns: right reduction, left TRAM flap. Skin-sparing mastectomy of left breast performed within the confines of an inverted T mammaplasty pattern, similar to the pattern used for the right-sided reduction mammaplasty.

Figure 13 Mirror-image skin patterns: right implant reconstruction, left mastopexy with skin-sparing mastectomy performed with vertical pattern similar to pattern used for left-sided mastopexy.

The mammaplasty pattern mastectomy concept is also very useful for bilateral TRAM flaps. If the native breasts are large, there may be insufficient abdominal tissue to adequately fill the skin envelopes, necessitating skin reduction. A vertically oriented mastectomy tightens the skin envelope and shapes the lower pole of the breast. Once the vascularity of the native breast skin is confirmed, the TRAM flap is de-epithelialized except for a circular areolar skin paddle. Secondary TRAM-plasty may be useful to equalize or improve the breast mounds. Nipple-areolar reconstruction may be done over the circular TRAM flap skin paddle with a peg or other technique, leading to the appearance of a bilateral breast reduction (Figs. 14–16).

SUMMARY

It may take several operations to achieve optimal results in breast reconstruction. If the contralateral breast is a good aesthetic goal, revisions to the reconstructed breast mound will improve symmetry. If the contralateral breast is not appropriate in size or shape, then mammaplasty to bring it closer to the reconstructed breast mound is indicated. Often, both approaches are utilized. When

A

B

C

Figure 14 Vertically oriented skin-sparing mastectomies and bilateral TRAM flaps with subsequent nipple-areolar reconstruction.

Figure 15 Vertically oriented skin-sparing mastectomies and bilateral TRAM flaps with subsequent nipple-areolar reconstruction.

Figure 16 Vertically oriented skin-sparing mastectomies and bilateral TRAM flaps with subsequent nipple-areolar reconstruction.

feasible, the use of mammoplasty skin patterns on either breast, in a mirror-image configuration, can maximize symmetry.

REFERENCES

1. Hidalgo DA. Aesthetic refinement in breast reconstruction: complete skin-sparing mastectomy with autologous tissue transfer. *Plast Reconstr Surg* 1998;102:63-70
2. Losken A, Carlson GW, Bostwick J III, Jones GE, Culbertson JH, Schoemann M. Trends in unilateral breast reconstruction and management of the contralateral breast: the Emory experience. *Plast Reconstr Surg* 2002;110: 89-97
3. Stevenson TR, Goldstein JA. TRAM flap breast reconstruction and contralateral reduction or mastopexy. *Plast Reconstr Surg* 1993;92:228-233
4. Greco RJ, Dascombe WH, Williams SL, Johnson RR, Kelly JL. Two-staged breast reconstruction in patients with symptomatic macromastia requiring mastectomy. *Ann Plast Surg* 1994;32:572-579
5. Knowlton EW, Gorey R, Taekman J. Total immediate breast reconstruction with "peg" latissimus dorsi flap. *Contemp Surg* 1992;41(3):15-19
6. Restifo RJ. Expanding the Indication for the Vertically Oriented Scar in Breast Surgery. Presented at the 68th Annual ASPRS Scientific Meeting, New Orleans, LA, October 25, 1999