Reduction and Mastopexy of the Reconstructed Breast: Special Considerations in Free Flap Reconstruction

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Abstract

Autologous breast reconstruction is capable of creating a breast that closely resembles a natural breast. Reduction and mastopexy in this type of reconstruction yields several challenges to the reconstructive surgeon. Revision surgery is common to achieve symmetry; however, reduction, mastopexy, and other revision techniques are sparse in the current literature. Often, these techniques are passed from mentor to student during plastic surgery training or are learned with experience in managing one's own patients. Reviewing anatomical principles unique to this subset of patients is essential. We must also consider factors unique to this group including the effects of delayed reconstruction, radiation, skin paddle size, and flap volume. In this article, the authors describe some of the common principles used by experienced reconstructive surgeons to perform reduction and mastopexy in autologous breast reconstruction to achieve a natural, aesthetically pleasing breast reconstruction. In addition, they have included several case examples to further illustrate these principles.

Keywords

- breast reduction
- mastopexy
- autologous breast reconstruction
- breast cancer

Breast reconstruction utilizing autologous tissue offers perhaps the most natural appearing and feeling breast reconstruction available today. Benefits include utilization of donor tissue that more accurately mimics that of breast tissue. In the appropriate candidate, the abdominal donor site in the form of the deep inferior epigastric artery perforator (DIEP) flap offers a well-concealed scar with skin and volume required to replace both skin sparing and total mastectomy defects. Often, and especially in the unilateral setting, autologous reconstruction benefits from revisionary procedures to obtain symmetry. Reduction and mastopexy of the autologous reconstructed breast presents a unique set of variables and challenges to the reconstructive surgeon, which we believe is quite different than reduction and lifting of the native breast. Traditional breast reduction and lifting techniques are abundant in the plastic surgery literature.^{1–3} Shaping of the reconstructed breast, however, is rarely discussed, and different considerations are poorly defined. Here we delineate some of the

special considerations in this select group of patients through discussion of various challenges when shaping a DIEP flap. Due to the nature of this discussion, case examples are utilized to illustrate various points.

Breast Composition in the Autologous Reconstructed Breast

The complete anatomy of the breast is beyond the scope of this article. For our purposes here, we can divide the breast into three essential components: nipple-areolar complex (NAC), breast skin, and breast volume/parenchyma. Each of these parts plays a role in conventional reduction and mastopexy, as well as in reduction/mastopexy of the autologous reconstructed breast. In addition to exploring each individually, each must be considered in relation to the other to create an aesthetically pleasing breast.^{4–6} Autologous reconstruction presents unique considerations for each of these components.

Nipple-Areolar Complex

In traditional reduction and mastopexy techniques, the NAC is mobilized on a particular vascularized pedicle. Countless such pedicles have been described including inferior, medial, superior, and superomedial.⁷ In breast reconstruction utilizing the DIEP flap, this differs in several regards. In non-nipple sparing mastectomy reconstruction, there is complete absence of the NAC and often a monitoring skin paddle where the original NAC resided. This provides a great deal of freedom in deciding where to place the NAC. There is no defined pedicle upon which the NAC is mobilized. Instead, the nipple is reconstructed using a variety of local skin flaps and the areola reconstructed using like tissue or tattooing. In the setting of nipple-sparing mastectomy with DIEP flap-based breast reconstruction, however, the NAC viability depends first on survival of the mastectomy flap, then gains vascular inflow via the underlying autologous reconstruction. Mobility of the NAC in these patients can be achieved safely via crescentic mastopexy techniques, leaving portions of the NAC attached to the original mastectomy skin. If significant mobility is required, we wait at least 3 months to allow neovascularization from the DIEP flap to the nipple. A traditional Wise pattern or circumvertical lifting procedure can follow. In smokers, diabetics, and those prone to wound-healing complications, a nipple delay procedure, whereby the surgeon divides the mastectomy flap dermal attachments to the NAC, should be considered as a first stage.⁸

Skin

Skin resection patterns in traditional mastopexy and reduction include the Wise pattern, circumvertical, and periareolar—among others.^{1–3} Similar skin resection patterns can be utilized in both immediate and delayed reconstruction utilizing the DIEP flap. However, several key differences exist. First, one must always be cognizant of respecting prior breast scars to ensure viability of mastectomy flaps. Previous lumpectomy scars, previous augmentation scars, and so on should be considered and often can be utilized within the lifting and reduction pattern. In addition, we believe mastectomy skin from immediate and delayed reconstructions differs greatly. In immediate reconstruction, skin flaps are significantly more thin and pliable. This skin settles with time, similar to traditional mastopexy in the natural breast. Skin flaps in delayed reconstruction, however, are less pliable. This limits freedom of utilizing the mastectomy skin for creation of a soft, naturally ptotic lower pole. In our practice, the majority of patients who undergo delayed reconstruction also have completed postmastectomy radiation therapy (PMRT), which significantly limits the usefulness of the mastectomy flaps. In select cases, we have found that utilizing a tissue expander at the time of mastectomy, followed by PMRT and tissue expansion (the “delayed-delayed” concept of Kronowitz et al) offers an opportunity to occasionally utilize the lower pole mastectomy skin and limit the “patch” effect of the abdominal skin.⁹

Volume/Parenchyma

Volume reduction in traditional breast reduction techniques usually involves direct parenchymal excision. Pedicle

choice for the NAC allows for identification of other tissue for resection and shaping of the natural breast. Liposuction of the natural breast has also been described and is occasionally utilized in the senior author's practice.¹⁰ However, this offers limited reduction and minimal skin tightening, which remains the major limitation in selection of this procedure.

Often volume discrepancies in the breast reconstructed utilizing the DIEP flap are limited to one specific area. For this reason—and in our hands—reduction of the autologous reconstructed breast often can safely and effectively be completed with liposuction of specific areas. Liposuction reduction of DIEP flaps allows subtle changes in shape, which are often required during secondary procedures in these patients. Further, in patients who underwent PMRT and delayed DIEP flap reconstruction, liposuction offers a safe alternative to direct excision, which may otherwise necessitate creating risky additional incisions on radiated skin.¹¹

Factors to Consider

The above discussion on the differences of the NAC, the skin, and the volume/parenchyma in autologous breast reconstruction allows for a foundation in the tools available to the reconstructive surgeon when aiming to achieve symmetry with the native breast. Further consideration, however, must be given to the specific differences introduced to the reconstructed breast when the abdomen is utilized. It is our opinion that considering these differences when planning symmetry and revisionary procedures affords a unique perspective, which aids in these clinical challenges.

Breast Skin versus Abdominal Skin

Millard's fundamental plastic surgery principle of replacing like with like is especially true in breast reconstruction.¹² In our opinion, the ideal donor skin for reconstructing resected mastectomy skin is abdominal pannus skin. Its pliability and quality are most similar to breast skin in most patients. Further, as a donor site it often allows ample skin for use in delayed breast reconstruction after PMRT when larger skin paddles are often required.

However, abdominal skin does not always behave as breast skin does. In younger women who have not had children, abdominal skin may be thicker and more collagenated. After undergoing the expansion and re-coil effect of pregnancy, much of the elastic properties are lost, making the dermis thinner and less collagenated, often with stretch marks as the visual sign of such. Clinical examination may help in recognition of these differences. For some women, this means rearranging breast skin can provide a significant mastopexy effect; in some, it does not provide support to the underlying parenchyma. The same exists for abdominal skin. In a patient with thicker, highly collagenated skin, resection and rearrangement can provide significant support to underlying parenchyma and lasting mastopexy results. In other patients with thin, poorly collagenated skin, it may be prone to recurrent ptosis.

Another significant difference that exists between breast skin and abdominal skin is the interconnecting fascial system. In breast skin, Cooper's ligaments provide structural integrity between the breast parenchyma and the overlying breast dermis. There is wide variability among women in terms of strength and integrity of these ligaments. In some women, they play a significant role in maintaining breast structure associated with the skin, whereas in other women these ligaments play little to no role. Abdominal tissue completely lacks these connections to the skin and therefore often lacks a strong inherent structural connection between the skin and underlying fat.

One must also consider the difference between immediate and delayed reconstruction. Again, immediate reconstruction yields mastectomy flaps that often consist of soft pliable skin, whereas delayed reconstruction yields skin that is thicker and less pliable and often radiated. Because of this phenomenon, in delayed reconstruction we often replace lower-pole mastectomy skin with abdominal skin to provide a naturally ptotic breast. This, again, is especially true in radiated breast skin, which often needs entire lower-pole skin replacement. Even after replacement with nonradiated abdominal skin, the breast in these reconstructed patients tends not to settle as much as those with nonradiated mastectomy skin covering the lower DIEP flap. This observation could be due to loss of ligamentous support in the mastectomy skin, dermal difference in the abdominal donor tissue, or perhaps due to the radiated upper mastectomy continually offering a tightened "sling" effect. Regardless, this finding is consistent and must be considered when adjustments for symmetry are made.

Breast Parenchyma versus Abdominal Fat

The density of breast parenchyma varies greatly from individual to individual. Women with greater parenchyma to fat ratio (generally younger women) can rely on parenchymal rearrangements to uphold breast structure/lifting in the native breast. Women with greater fat to parenchyma ratio (generally older women) may need skin rearrangement or sling support to uphold long-term breast structure/lifting. In the DIEP flap breast reconstruction, abdominal fat acts to replace breast parenchyma changing the traditional considerations in reduction and mastopexy. Abdominal fat lacks the traditional parenchymal structure and shape of a breast. Therefore, the abdominal flap must be shaped to achieve and maintain the structure and shape of the breast. Some surgeons utilize manipulation of the mastectomy skin to shape the DIEP flap, whereas others shape the flap with sutures to give a more conical shape. In our practice, we utilize both in most cases.

In the initial stage, we find that de-epithelialization of the large skin sparing mastectomy allows for simulation of either a circumvertical or Wise-pattern mastopexy. Further, we routinely "cone" DIEP flaps, de-epithelializing central aspects and shaping with sutures to achieve a more conical appearance. Although completely burying flaps is often possible, we rarely do so (except in the nipple-sparing setting) as we find this effect "flattens" the breast. Leaving a central dermal

portion at the planned location of the NAC allows for increased, though not perfect, projection.

Prior Radiation

Radiation effects on skin and soft tissue vary by individual and by intensity/duration of radiation. For autologous reconstructed breasts utilizing the DIEP flap in the delayed setting, though, the radiated superior mastectomy flap yields a reconstructed breast that is less prone to ptosis, even when the entire lower-pole radiated mastectomy skin is replaced with abdominal skin. In fact, the position of the breast at 3 months postoperatively does not descend significantly. This can be seen even a year or years later. In such cases with unilateral reconstruction, we tend to overlift the native contralateral breast to compensate for this phenomenon. In bilateral reconstructions with unilateral radiation, we do the same.

Managing the inset of the DIEP skin paddle in first-stage autologous reconstruction requires careful planning. In patients with severe radiation-induced skin fibrosis and hyperpigmentation, we routinely delay at least 6 months after PMRT and often excise the majority of the lower pole to allow for a more natural ptotic shape. In patients who have a tissue expander in place, without such severe radiation-induced changes, we expand as tolerated prior to DIEP flap reconstruction and preserve as much native skin as possible. This avoids a large patch-like effect of the DIEP flap skin paddle.

Revision with mastopexy in the radiated setting is rarely needed for reasons already outlined. When skin resection is required, however, we proceed with great caution by avoiding additional incisions on radiated skin, which are prone to poor healing and complications. Further, if at all possible, we prefer to avoid reopening the inframammary junction of radiated skin and flap skin. We find this is often the area of greatest healing challenge. Instead, we preferentially lift and reduce the radiated side through previously made upper breast incisions. Again, because the radiated breast is usually not prone to ptosis, these additional incisions are often not needed, and isolated reduction can be more safely achieved with liposuction in this setting.¹¹

Size of Skin Paddle

Keeping the skin paddle to the size of the areola ultimately provides the most aesthetic NAC reconstruction. However, this must be balanced with leaving a skin paddle large enough to produce natural ptosis and achieve a breast mound consistent with the patient's wishes and goals. A balance exists between replacing mastectomy skin flap with DIEP skin paddle. The benefits of leaving a large DIEP skin paddle include natural progression of ptosis as stated previously. This must be balanced with the patch-like effect of leaving a large skin paddle, which is often aesthetically displeasing.

Traditionally, radiated mastectomy flaps are replaced in the inferior and lateral subunit to achieve natural ptosis. Again, this must be taken in consideration with the amount of ptosis in the contralateral breast, which is variable. For example, a young patient with small to medium nonptotic breasts might be best served with a small DIEP skin paddle

and nonptotic breast. An older patient with large, ptotic breasts will likely be better served with DIEP skin paddle replacement of the entire lower pole to match native contralateral ptosis. Of course, secondary mastopexy or reduction of the contralateral breast in unilateral reconstructions is commonly needed to achieve symmetry.

Secondary mastopexy of the radiated or nonradiated reconstructed breast might require reducing skin paddle size to lift the breast or to shift its position on the chest wall. We prefer to remove a DIEP skin paddle over resecting radiated mastectomy flaps to avoid the complications associated with incisions on radiated skin. This also creates a smaller skin paddle, which is usually more aesthetically pleasing and leaves the aesthetic unit of the décolletage generally unharmed. One exception to this is the case in which mastectomy skin flaps have had partial necrosis and scarring. In such cases, we excise the scar as appropriate for shape to decrease unsightly scar burden.

Natural Breast Skin/Subcutaneous Tissue versus Mastectomy Flap

We find that natural nonradiated immediate mastectomy flaps behave quite differently than their nonradiated delayed counterparts. Immediate flaps retain the natural pliability of a breast, whereas delayed flaps have some level of fibrosis both with and without tissue expander utilization. As the indications for PMRT continue to evolve, we found placement of a tissue expander at the time of mastectomy for patients at moderate risk for PMRT allows for successful evaluation of the specimen and multidisciplinary determination of need for radiation prior to autologous reconstruction. This avoids the complicating factor of radiating a DIEP flap, which we continue to attempt to avoid if at all possible. As this patient population has grown, we found that patients with delayed mastectomy flaps with tissue expanders in place have thicker, more rigid structure—not surprising considering the capsule formed in this setting. Because of this lack of pliability, these flaps are less likely to develop ptosis. Ultimately, both immediate and delayed mastectomy skin flaps are shaped using traditional mastopexy skin resection patterns as well as direct skin excision to achieve mastopexy effect; however, we find that less dermal “lifting” is required when a tissue expander was placed at the time of mastectomy and autologous DIEP flap reconstruction proceeds in the delayed-immediate setting.

Size of DIEP Flap

Like a natural breast, the weight of a DIEP flap plays a role in developing ptosis. Like a natural breast, the larger the flap the greater the degree of ptosis over time. Reduction methods include direct excision via existing incisions and liposuction. Liposuction remains a safe option even in the face of radiation therapy.¹¹

Buried Dermis

One of the many goals of breast reconstruction includes recreating a breast that is as soft as a natural breast. This is one reason many women prefer autologous reconstruction

over implant-based reconstruction. Even in abdominally based autologous reconstruction, however, this can be difficult to achieve. As mentioned above, delayed mastectomy flaps and radiation-induced skin changes can create fibrotic changes in the skin and parenchyma. One method to minimize breast firmness in the face of delayed/radiated reconstruction is removing the entire dermis of the DIEP flap except the skin paddle rather than simple de-epithelialization. This eliminates the “dermis on dermis” effect that can result in a more-firm reconstruction. The disadvantage, of course, is the lack of the subdermal venous plexus in potential prevention of venous congestion of the limited exposed skin paddle, which in our experience is a self-limited issue.

Suction-Assisted Lipoplasty of Flap Status Post Radiation Therapy

In reducing the autologous reconstructed breast, options including direct excision and suction-assisted lipoplasty exist. Liposuction includes the added benefit of shaping and contouring the breast for a more aesthetic shape. We find this method to be the most effective in small- to moderate-volume reductions. In the face of radiation therapy, we choose to wait at least 3 months prior to performing liposuction of the flap. Despite the concern for impaired blood flow after liposuction, we have not found a clinically significant incidence of partial or complete flap failure.¹¹

Achieving Projection with Free Flap Reconstruction

The ideal aesthetic breast is debatable according to personal and regional preference. However, most would agree that most patients desire central breast projection. The ideal aesthetic breast holds a three-dimensional conical shape to varying degrees. However, the abdominal pannus, which is most commonly used in autologous reconstruction, has a flatter two-dimensional shape. To overcome this, some surgeons choose to use gluteal or transverse upper gracilis (TUG) free flaps, which are more easily shaped into a cone. We still prefer to use the abdomen as a donor site and use the following modifications to achieve central breast projection. We routinely inset our flap after rotating 90 degrees. This leaves the umbilicus at the base of the breast along the inframammary fold. We close the umbilical defect to create some projection at the lower fold. If additional projection is desired, we gently cinch the base of the flap with an air-knotted suture (again, the portion that lies along the inframammary fold). Care is taken to avoid excessive tension on the suture that may compromise the lie of the pedicle on the flap's deep surface.

In women who desire a small volume enhancement, we often place a small implant posterior to the DIEP flap to create central breast projection. We also routinely use fat grafting at the superior pole and medial breast to improve contour irregularities and create projection. We do not routinely use large volume fat grafting in the DIEP flap during secondary procedures; however, this certainly could improve volume and central breast projection while avoiding the use of an implant.

Like traditional mastopexy techniques, circumvertical and Wise-pattern skin resections during secondary procedures provide a parenchymal mastopexy effect and improve central breast projection. We limit the use of periareolar/circumferential skin paddle resections because they tend to flatten the breast and decrease central projection. In addition, because of the variability in skin paddles, skin resection must be tailored to each individual breast. We often use tailor tacking in the operating room to determine the degree and direction of skin resection. In general, vertical excisions of skin will improve projection and will raise the skin paddle/central breast and horizontal skin resections will flatten the lower pole of the breast and lower the skin paddle/central breast.

Avoid Pedicle Division, If Possible

We wait at least 3 months between secondary revision surgery to allow the reconstructed breast to “settle” to its more long-term position and achieve a certain degree of neovascularization. During secondary surgery, we take caution to avoid division of the pedicle. Ideally, we would never divide the pedicle; however, we have divided the vessels in the setting of implant placement as early as 3 months postoperatively with no incidence of partial or complete flap loss.

Criticisms

Like every plastic surgery procedure, each breast reconstruction presents a unique set of variables. Although the above-mentioned principles provide a guide for decision-making in performing reduction and mastopexy of DIEP flap breast reconstructions, they are not absolute rules. Every reconstruction must be approached individually. Each native breast is different in terms of skin quality, fat to parenchyma ratio, NAC position, and degree of ptosis. The reconstructed breast is even more challenging in the sense that we must consider factors such as radiation-induced skin changes, delayed mastectomy flaps, and abdominal fat. Traditional skin resection techniques are utilized in breast reconstruction patients; however, they may have less or more of a “lifting” effect depending on the quality of the associated abdominal skin

and fat. In addition, the NAC is mobilized on a pedicle in traditional mastopexy/reduction techniques. The benefit of a superomedial pedicle in maintaining mastopexy effect over an inferior pedicle is often raised in traditional reduction. In the reconstructed breast, such NAC mobilization on a pedicle does not exist and we are limited by different factors in maintaining the mastopexy effect.

Case Examples

Breast Reduction (Nonreconstruction)

EB was a 17-year-old woman with bilateral macromastia who underwent bilateral inferior pedicle, Wise-pattern breast reduction. Notice her early postoperative superior pole fullness followed by later postoperative descent of breast parenchyma and loss of superior pole fullness. This example highlights the well-known tendency of breast skin to “relax” over time. Our experience suggests that mastectomy skin over DIEP flap reconstruction settles *less* than these traditional breast reduction and mastopexy examples. As such, this concept should be considered when planning revisionary procedures of the autologous breast reconstruction (► Figs. 1, 2).

Unilateral Granulomatous Mastitis Status Post Mastectomy and DIEP Reconstruction; Contralateral Mastopexy

FA was a 32-year-old woman with right granulomatous mastitis (otherwise healthy). She underwent a right mastectomy followed by DIEP flap reconstruction 4 weeks later. Five months after DIEP flap reconstruction she underwent bilateral asymmetric mastopexy. For her right breast we reduced her skin paddle to limit the “patch” to the location of the planned NAC, narrowed her breast mound via direct parenchymal excision, re-elevated her mastectomy flaps to re-drape the mastopexy and tailor tacked the breast to shape and match the contralateral side. For her left breast we performed a circumvertical mastopexy.

Note in her postoperative photo that her right breast maintains its shape and position on the chest wall and does

Fig. 1 (A) 1 month postoperative. (B) 6 months postoperative.

Fig. 2 (A) 1 month postoperative. (B) 6 months postoperative.

not descend to the degree that her left breast does. This may be due to the inflammatory changes associated with granulomatous mastitis, buried dermis, and/or the differing quality of her abdominal fat. Her left breast initially has more superior pole fullness, but descends over time as a native breast typically does. Again, planning for such differences in the reconstructed and natural breast will improve outcomes (► Figs. 3–6).

Unilateral Radiation Therapy/Delayed DIEP and Contralateral Mastopexy

PF was a 64-year-old woman with left breast cancer (prior surgical history included an open cholecystectomy via right subcostal incision and aortic aneurysm repair) underwent neoadjuvant chemotherapy followed by mastectomy and

adjuvant radiation. Over 1 year later, she underwent left breast reconstruction with DIEP free flap, which required a large skin paddle due to constrictive effects of radiation. Nine months later, she underwent a left breast revision consisting of the following: a local mastopexy at the junction of the radiated mastectomy flaps and DIEP flap, resection of redundant tissue, and fat grafting in the superomedial and lateral reconstructed breast. For her right breast, she underwent a mastopexy with a short scar Wise-pattern-type skin excision. At the time of nipple reconstruction 4 months later, she underwent repeat fat grafting to the left reconstructed breast (► Figs. 7–9).

Bilateral DIEP Reconstruction: Right Radiated Delayed DIEP Reconstruction, Left Immediate DIEP Reconstruction

SW was a 41-year-old woman right breast cancer status post (s/p) neoadjuvant chemotherapy, mastectomy, and adjuvant radiation. She elected to undergo right delayed DIEP free flap reconstruction as well as left prophylactic mastectomy and immediate DIEP free flap reconstruction. Several months after free flap reconstruction, she underwent the following revision surgery. For her right breast, she underwent suction-assisted lipoplasty of her superior pole shelf deformity (increased projection of right superior pole likely due to the lack of parenchymal descent associated with radiation), 70-cc fat grafting to her superomedial pole, and nipple reconstruction. For her left breast, which descended to a greater degree (because it was nonradiated), she underwent a circumvertical mastopexy, resection of redundant skin and fat, and nipple reconstruction (► Figs. 10–13).

Bilateral DIEP Reconstruction: Left Delayed Right Immediate, No Radiation

LA was a 53-year-old woman (open cholecystectomy via right subcostal incision, total abdominal hysterectomy,

Fig. 3 Preoperative markings.

Fig. 4 (A) 10 days postoperative. (B) 4 months postoperative.

Fig. 5 (A) 10 days postoperative. (B) 4 months postoperative.

Fig. 6 (A) 10 days postoperative. (B) 4 months postoperative.

Fig. 7 (A) Preoperative prior to deep inferior epigastric artery perforator reconstruction. (B) Intraoperative.

Fig. 8 (A) Preoperative prior to first revision reconstruction. (B) 5 months postoperative. (C) 7 months postoperative.

Fig. 9 (A) Preoperative prior to second revision surgery. (B) 18 months postoperative.

Fig. 10 (A) Preoperative. (B) Status post mastectomy and radiation.

laparoscopic hiatal hernia repair) who had a left breast cancer s/p left mastectomy and development of right breast cancer 6 years later. She elected to undergo right mastectomy and bilateral DIEP flap reconstruction (left delayed, right immediate). Five months after successful autologous reconstruction, she underwent a bilateral breast revision surgery. For her right breast, which was larger and more ptotic, she underwent a short scar Wise-pattern mastopexy procedure with select direct resection of redundant tissue to improve symmetry. We left the right breast with more superior pole fullness predicting that it would settle slightly. For her left breast, we resected her lateral flap skin, thinned her medial flap via direct excision, excised excess skin and fat inferiorly to recreate a natural ptotic shape. She

later underwent bilateral nipple reconstruction in an in-office setting. Note that her right superior pole is initially very full after her mastopexy, but settles. However, her inferior pole and inframammary fold remain at the same level. This effect is consistently seen in the autologous reconstructed breast and should be considered when revision surgery is planned (► Figs. 14, 15).

Unilateral Delayed-Immediate DIEP Reconstruction and Contralateral Reduction

RS was a 45-year-old woman (C-section, left thoracotomy for ablation of a patent ductus arteriosus) with left breast cancer who underwent a left mastectomy and placement of a tissue expander until her need for radiation was

Fig. 11 (A) 2 months postoperative showing descent of the immediate reconstruction without descent of the right, previously radiated chest.

Fig. 12 Preoperative markings for revision surgery, liposuction of right upper flap, fat grafting to junction of chest, left circumvertical mastopexy, and bilateral nipple reconstruction.

Fig. 13 Final postoperative prior to tattooing.

determined. One month later, after determining she did not need radiation, she underwent removal of her left tissue expander and DIEP reconstruction. Eight months later she underwent a revisionary procedure of her left breast as well as a right breast reduction. For her left breast, which lateralized and had hollowing of the superior pole, she underwent the following: medialization of the flap and narrowing of the skin paddle (by re-elevating the mastectomy flaps and mobilizing the flap medially, then reducing the skin paddle to the size of an areola), suction-assisted lipoplasty of the upper outer quadrant, and 25-cc fat grafting to the upper, medial, and lateral poles. For her right breast, which was larger and more ptotic, she underwent a Wise-pattern breast reduction with appropriate plans for this breast to settle more than the contralateral DIEP flap. This patient subsequently underwent revisions, which included repeat fat grafting, nipple reconstruction, and isolated reduction of the natural right breast with liposuction to achieve symmetry (► Figs. 16, 17).

Fig. 14 (A) 1 month postoperative from revision reconstruction. (B) 5 months postoperative. (C) 9 months postoperative.

Fig. 15 (A) 1 month postoperative from revision reconstruction. (B) 5 months postoperative. (C) 9 months postoperative.

Fig. 16 (A) Status post left breast deep inferior epigastric artery perforator reconstruction. (B) Preoperative markings for initial revision surgery.

Fig. 17 (A) 2 months postoperative. (B) 6 months postoperative. (C) 12 months postoperative.

Conclusion

Performing reduction and mastopexy of the autologous reconstructed breast has unique considerations that require careful thought. Although each patient needs to be considered as an individual, the above-mentioned principles aid in guiding an operative plan.

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