

Superomedial Pedicle Reduction with Short Scar

Scott L. Spear, M.D., F.A.C.S.,¹ Steven P. Davison, M.D., D.D.S., F.A.C.S.,¹ and Ivan Ducic, M.D., Ph.D.¹

ABSTRACT

Reduction mammoplasty combining a superomedial pedicle with a circumareolar/vertical pattern skin excision avoids an inferior pedicle that can interfere with vertical scar technique, yet it is flexible enough to allow for a short transverse skin excision. This technique is suitable for small to moderate-size reductions.

KEYWORDS: Vertical reduction, mammoplasty, superomedial pedicle, SPEAR technique

This article is included in *Seminars in Plastic Surgery* as it combines two current ideas to reduce scar techniques in breast reduction highlighted in this issue by Drs. Hall-Findlay and Hammond. While reading papers on breast reduction, it is important to appreciate that the two main components of the pedicle and skin excision are independent, yet remain related. Therefore, alternating combinations of pedicle technique with alternative skin excisions may be more common and flexible in the future.

The technique of a circumvertical skin pattern of excision derived from mastopexy techniques is married to a superomedial dermoglandular pedicle. The pedicle technique is similar to that described by Hall-Findlay,¹ but the skin pattern has a flexibility to manage excess skin at the inframammary fold.

TECHNIQUES

Vertical Reduction Techniques

LASSUS/LEJOUR

In 1970, Lassus reintroduced the vertical technique of breast reduction that involved en bloc resection of in-

ferocentral skin, fat, and gland.² In his technique, the nipple-areolar complex is transposed on a superiorly based thick dermoglandular flap; lateral skin and breast flaps are closed en bloc together centrally in a vertical scar pattern on the breast meridian; and no lateral or medial skin flap undermining is performed. Initially, the vertical scar extended across the fold toward the abdomen. To avoid this complication, Lassus later modified the extension of the scar inferiorly toward the inframammary fold by adding a short horizontal incision at the fold; he later reverted to a vertical-only scar by limiting the inferior extent of the resection and gathering the inferior skin. The Lassus technique does not involve significant lateral breast gland or skin flap undermining, thereby reducing the risk of gland and particularly skin necrosis. The inferior central wedge resection with vertical closure results in increased projection. However, the breasts may have an initial distorted appearance; significant settling is necessary before the final shape is apparent. In addition, puckering, or hypertrophic scars, occurs in some patients in the vicinity of the inframammary fold.

In the early 1990s, Lejour presented her technique for vertical reduction mammoplasty that included adjustable skin markings, initial liposuction for volume

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reduction, and extensive lower lateral breast skin undermining.³ Her technique also uses a superiorly based dermoglandular pedicle with suture closure of the lateral pillars to create the aggressive conical shape of the breast. Again, the early breast shape in the Lejour procedure is characterized by an exaggerated projection that requires time to develop the final postoperative shape. The form that is achieved has no reliance on the skin envelope for its shape, and up to 6 months may be required for the breast to settle and for the gathered skin along the vertical closure to smooth and flatten.

SHORT SCAR PERIAREOLAR-INFERIOR PEDICLE REDUCTION

The technique described by Hammond includes a vertical reduction technique to reduce the scar that maintains the safety and familiarity of the inferior pedicle for the nipple-areolar complex.^{4,5} The procedure is described elsewhere in this issue. It adds the potential advantage of circumareolar mastopexy with the gathering of excess breast skin with both purse-string periareolar closure and a vertical seam to minimize skin wrinkling. This combination of techniques reduces the associated puckering as seen with a periareolar closure alone. However, utilization of an inferior pedicle may interfere with an associated vertical scar reduction. The short scar periareolar-inferior pedicle reduction (SPAIR) technique, as with other inferior pedicle techniques, requires significant time for de-epithelialization.

HALL-FINDLAY

This technique also is described elsewhere in this issue. The Hall-Findlay technique seeks to avoid the horizontal scar and prevent postoperative bottoming out and is modified from Lejour's vertical reduction technique.¹ Their major modification is utilization of a superomedial dermoglandular pedicle as opposed to a superior dermal pedicle. This technique involves Lejour-style skin markings with a vertical scar. It uses a short pedicle that does not require undermining behind the nipple or under the skin, which in turn maximizes reliability of circulation and nerve sensation. Unlike Lejour, Hall-Findlay eschews liposuction of the breast. The breast may again take time to reach its final desired shape and bunch at the inferior aspect of the vertical incision.

OTHER TECHNIQUES

Other authors have described a variety of techniques to minimize scarring. In 1982, Marchac and de Olarte discussed a method for the horizontal limb of the T-incision to be placed higher and reduced in associated length.⁶ Asplund and Davies described a vertical scar reduction as a medial glandular transposition that was essentially a superomedial pedicle combined with a verti-

cal scar pattern. The associated vertical scar could be extended to include an inferior skin excision to deal with associated dog-ear.⁷

Superomedial Pedicle Efficient Anatomical Reduction Mammoplasty Technique

The superomedial pedicle efficient anatomical reduction mammoplasty (SPEAR) technique uses a vertical reduction skin excision pattern similar to Hammond but with a superomedial dermoglandular pedicle similar to Hall-Findlay.⁸ Initial skin markings are similar to those of Hammond's SPAIR technique^{4,5} with the final vertical scar determined by a "tailor-tacking" method. The authors found that the excess skin at the inferior aspect of the vertical limb may not predictably settle in the postoperative period. To avoid the potential need for future revision in this area, a short horizontal incision may be used to treat the dog-ear in the operating room; alternatively, it can be defatted and left to settle.

PATIENT SELECTION

This technique is applicable to younger, nonobese patients with small to moderate breast reductions (size under 1000 g), with adequate skin elasticity and minimal to moderate associated ptosis. The addition of a Wise pattern may be appropriate with the superomedial pedicle when dealing with significantly larger breasts.

ADVANTAGES

In 1973, Weiner described a single superior dermal pedicle.⁹ Orlando and Guthrie followed in 1975 with their description of a superomedial dermoglandular pedicle.¹⁰ This technique was further popularized by Hauben, who described the associated safety and speed of this particular design.^{11,12} Finger and colleagues suggested the applicability of the superomedial pedicle technique in breast reductions as large as 4100 g, within a mean length of 11.6 cm pedicle.¹³

The significant advantages of the superomedial dermoglandular pedicle when used with the SPEAR technique are as follows:

1. The blood supply appears similar in reliability to the inferior or central pedicle¹⁴ as it originates from the internal mammary perforators.¹³ In larger reductions, feathering of the superomedial glandular pedicle can extend to perforators from the lateral thoracic artery and associated lateral intercostals and thoracoacromial vessels.¹³ The pedicle rotates easily into place and does not require folding or kinking. This contrasts to the superior dermal pedicle of Lejour,³ which may require folding and, as such, may involve vascular compromise of the associated pedicle.

2. The superomedial pedicle has a decreased arc of rotation and a shorter length than the inferior pedicle. Despite very large reductions, Finger and associates showed the mean length of the pedicle was 11.6 cm,¹³ and Hall-Findlay utilized a superomedial glandular technique used extensively in a wide range of mammoplasties.¹ With the SPEAR technique, similar size reductions using an inferior pedicle would be closer to 16 to 19 cm in length, potentially necessitating a free nipple graft. The arc of rotation is favorable in that the pedicle needs only be rotated ~110 degrees, resulting in minimal associated crimping or folding of the associated pedicle. The dermoglandular pedicle does not need to be sewn—it is held in place by the associated soft tissue pocket created by removal of tissues superior to the pedicle itself and by its attachment to the chest superomedially. This avoids the necessity of special steps to attach the pedicle superiorly as is done with the SPAIR technique.^{4,5}
3. The minimal de-epithelialization required with the superomedial pedicle dramatically decreases the amount of operating time relative to that with the inferior pedicle technique.
4. The superomedial dermoglandular pedicle's inherent design provides a substantial amount of superior medial fullness by preserving this quadrant of the breast. It accentuates this area and minimizes associated glandular "bottoming out" in breast reduction surgery. This is contrary to an inferior pedicle technique that attempts to bring up the inferior breast tissue superiorly while basing it inferiorly, thus involving two inherently opposed steps. Despite the need for breast reduction, patients are often most specifically interested in medial and superior fullness and elimination of inferolateral excess. The superomedial pedicle base location does not interfere with skin gathering that may be encountered in inferior-based reduction patterns. Diagnostic research has shown that the medial or superomedial technique compares favorably in postoperative breast sensitivity compared with the inferior pedicle. Clearly, no disadvantage exists here.¹⁵ Sensitivity to the nipple-areolar complex theoretically can be improved by flaring or feathering out the lateral contour of the pedicle in an attempt to incorporate the lateral rami of the fourth intercostal nerve and potentially pick up more contributions from the third and fifth intercostal nerves.^{16–18}

SKIN EXCISION

The skin reduction resembles the circumareolar closure described by Hammond in the SPAIR technique.^{4,5} The SPEAR technique's advantages lie in the flexibility of its scar results, which could include a tidy circumareolar and vertical excision only, a circumvertical closure with some

gathered skin at the fold, a circumvertical closure with a short inframammary scar, or an inverted T-style closure with a medium-sized transverse scar, similar and shorter than from a Wise pattern. The circumareolar closure utilizes a purse-string blocking stitch originally described by Benelli for periareolar mastopexy and reduction.¹⁹ The geometry of the circumvertical approach is skin excess removed by two separate mechanisms: (1) the central purse-string and (2) the vertical closure. The vertical closure reduces the outer circle diameter of the purse-string component by a factor of 3:1 (i.e., if the width of the vertical resection is 9 cm, then the outer circle diameter will be 3 cm less than what was originally drawn). The purse-string closure means that a larger aperture can be closed to a smaller aperture even with initial discrepancies in the diameter of 3:1 or even 4:1. Thus, a circumareolar circle diameter of 15 cm or more can be closed around an areola of 4 to 5 cm.

This technique is safest when limited to small to moderate reductions under 1000 g. When the size exceeds this amount, the skin excision becomes more complicated. The superomedial pedicle may still be appropriate in larger reductions, but it may be preferable to employ it with the Wise pattern.

MARKING

With the patient standing or sitting, standard breast landmarks are drawn, including the sternal notch, the chest midline, the breast meridian, and the inframammary fold. A tangent to the inframammary fold is transposed horizontally crossing the chest midline. The new nipple position is then transposed to the vicinity of or up to 2 to 4 cm above the inframammary fold. The site for the upper edge of the new areola position is marked 2 cm higher than the planned nipple site. As with other vertical surgical techniques, the breast is pulled medially to mark the point of the lateral breast that crosses the breast meridian at the inframammary fold. The breast is then pulled laterally to mark the point that the medial breast crosses the breast meridian (Fig. 1A). The breast is pulled superiorly, and vertical lines are dropped from each of these two points. The vertical extent of the resection is connected with a horizontal line ~4 cm above the inframammary fold (Fig. 1B). A circular or oval aperture is drawn from the planned new upper areolar margin to join the lower edge of the existing areola. The medial and lateral extent of the circumareolar excision should be conservative to leave similar amounts of skin medially and laterally and on each breast. The superomedial pedicle is marked within the drawn areolar aperture. An additional 5-mm fringe of dermis is marked within the aperture for de-epithelialization for use with the purse-string suture (Fig. 1C). The desired breast shape is then rechecked by simulating the vertical closure by pinching the medial and lateral marks together. After both sides are marked, check for

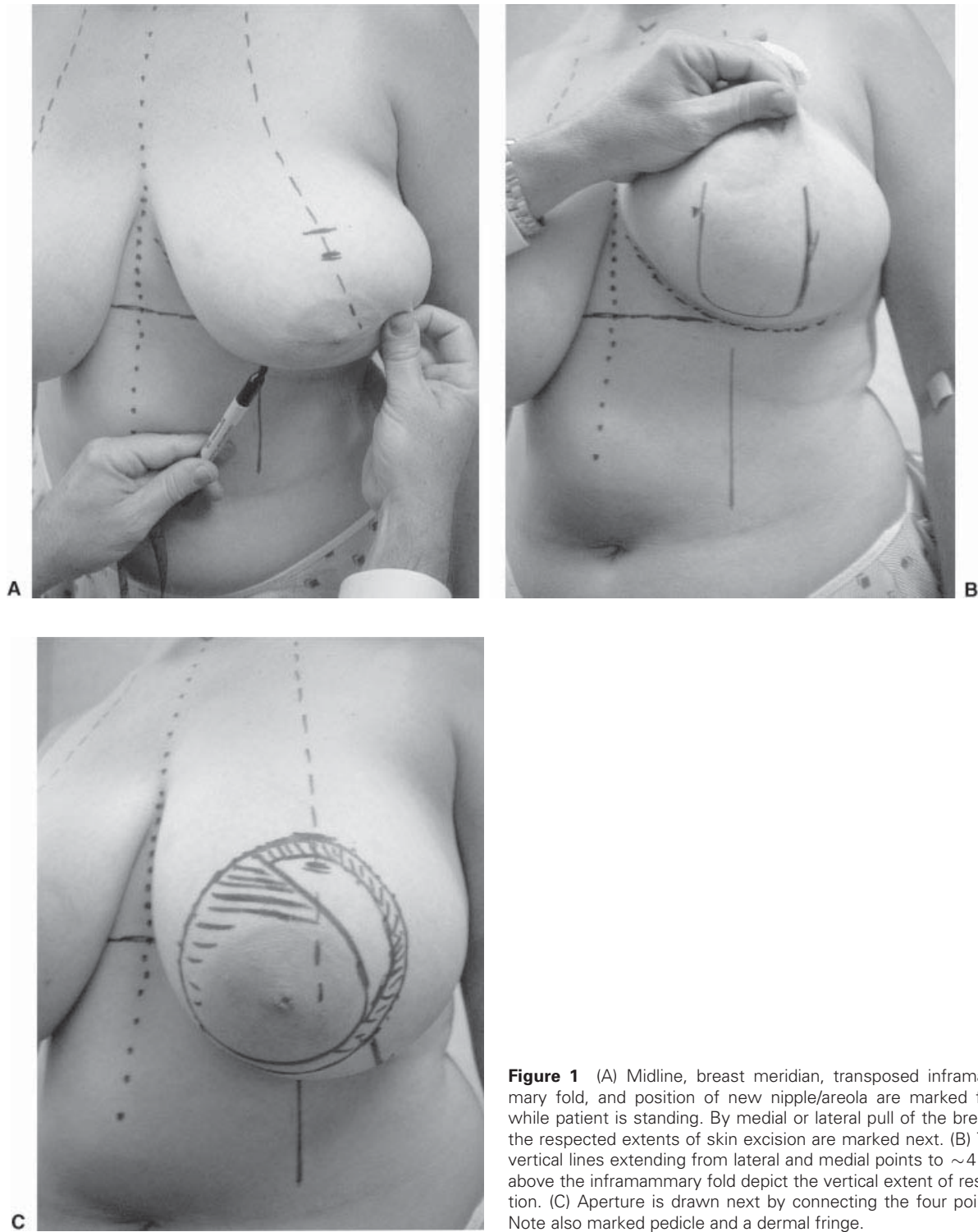


Figure 1 (A) Midline, breast meridian, transposed inframammary fold, and position of new nipple/areola are marked first while patient is standing. By medial or lateral pull of the breast, the respected extents of skin excision are marked next. (B) The vertical lines extending from lateral and medial points to ~4 cm above the inframammary fold depict the vertical extent of resection. (C) Aperture is drawn next by connecting the four points. Note also marked pedicle and a dermal fringe.

symmetry, particularly for what skin will be preserved as opposed to what will be resected.

SURGICAL TECHNIQUE

Once the patient is prepped and draped, redraw the preoperative markings. Recheck the 4-cm distance from the inframammary fold to the inferior horizontal line.

Inject the breast with tumescent fluid in the inferior and lateral quadrants. No tumescent fluid is placed under the pedicle. Mark the nipple at 38 to 42 mm. A 5-mm dermal fringe around the circle and in the superomedial pedicle is de-epithelialized (Fig. 2A).

Vertical cuts are made for excision of the lower pole excess skin and fat. The dissection is performed



Figure 2 (A) After the size of the areola is chosen, skin of the pedicle is de-epithelialized, as is the 5-mm dermal fringe on the inner side of the aperture. (B) Vertical cuts are made for excision of lower pole excess breast and skin, followed by those to separate the pedicle from the breast “C-like” tissue to be removed.

with emphasis to excise the majority of the tissue from beneath the lateral skin flap. An arc of tissue above the areolar is excised, and the pedicle left is a full-thickness superomedial dermoglandular flap attached to the subjacent chest wall (Fig. 2B). For closure, the 12 o'clock of the associated areola is sutured to the superior meridian of the breast, and superior edges of the vertical cuts are pulled together with suture. The vertical incision is approximated with staples that reveal a new higher inframammary fold (Fig. 3A). If the vertical skin comes together well, it is left to redrape; however, if there is puckering, it can be tailored. Minimal vertical skin excess can be excised and converted to a short horizontal scar (Fig. 3B). The precise location of the horizontal incision is not determined until the shape of the breast and drape of the tissues define the new inframammary fold. The skin bunching or apparent dog-ear identifies what tissue should be excised. To confirm the correct position and extent of the horizontal limb, measure the distance from areola to inframammary fold,

which, depending on breast size, should be 5 to 8 cm. Regardless, the areola is sutured at four opposite corners to fixate it prior to tailor-tacking. The circumareolar aperture is then reduced to approximately the size of the areola with a deep intradermal purse-string suture of 3-0 Goretex (W. L. Gore, Phoenix, AZ) or Ethibond (Ethicon, Somerville, NJ). The purse-string stitch is placed with a straight needle along the edge of the dermal fringe. The areola is further approximated to the surrounding skin with inverted, interrupted, intradermal 3-0 Monocryl (Ethicon, Somerville, NJ). The rest of the skin is closed in standard fashion with interrupted and intradermal running sutures.

CASE STUDIES

Case Study 1

A 45-year-old woman after 500-g reduction (Fig 4).



Figure 3 (A) After the pedicle is sutured to the breast meridian, vertical incision is approximated with staples prior to the Goretex application along the inner aperture's fringe. (B) Following areola closure, vertical limb is measured to a now higher inframammary fold. Minimal vertical skin excess is converted into a 3- to 4-cm horizontal scar.

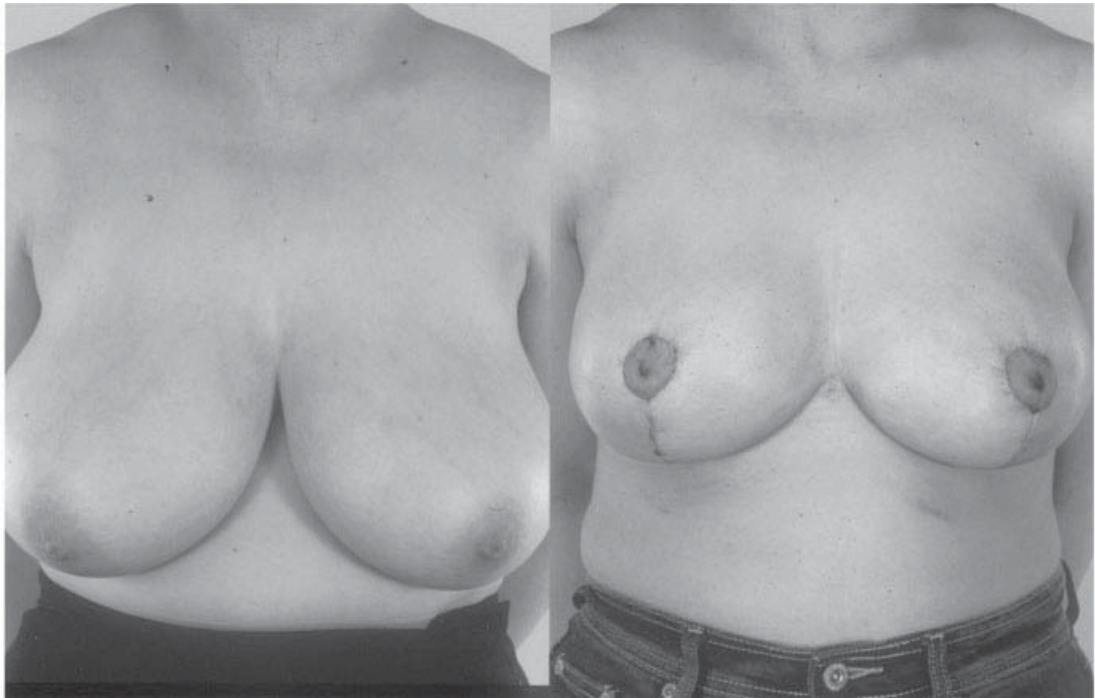


Figure 4 Pre- and postoperative views of a 45-year-old patient after 500-g reduction.

Case Study 2

A 37-year-old woman after 600-g reduction with a short inframammary fold scar (Fig. 5).

Case Study 3

A 29-year-old woman after 700-g reduction (Fig. 6).

SUMMARY

There are multiple advantages to performing breast reduction using the superomedial pedicle technique. The superomedial pedicle is as reliable as an inferior or central pedicle but poses no risk of excessive folding or associated crimping when rotating it into place. It

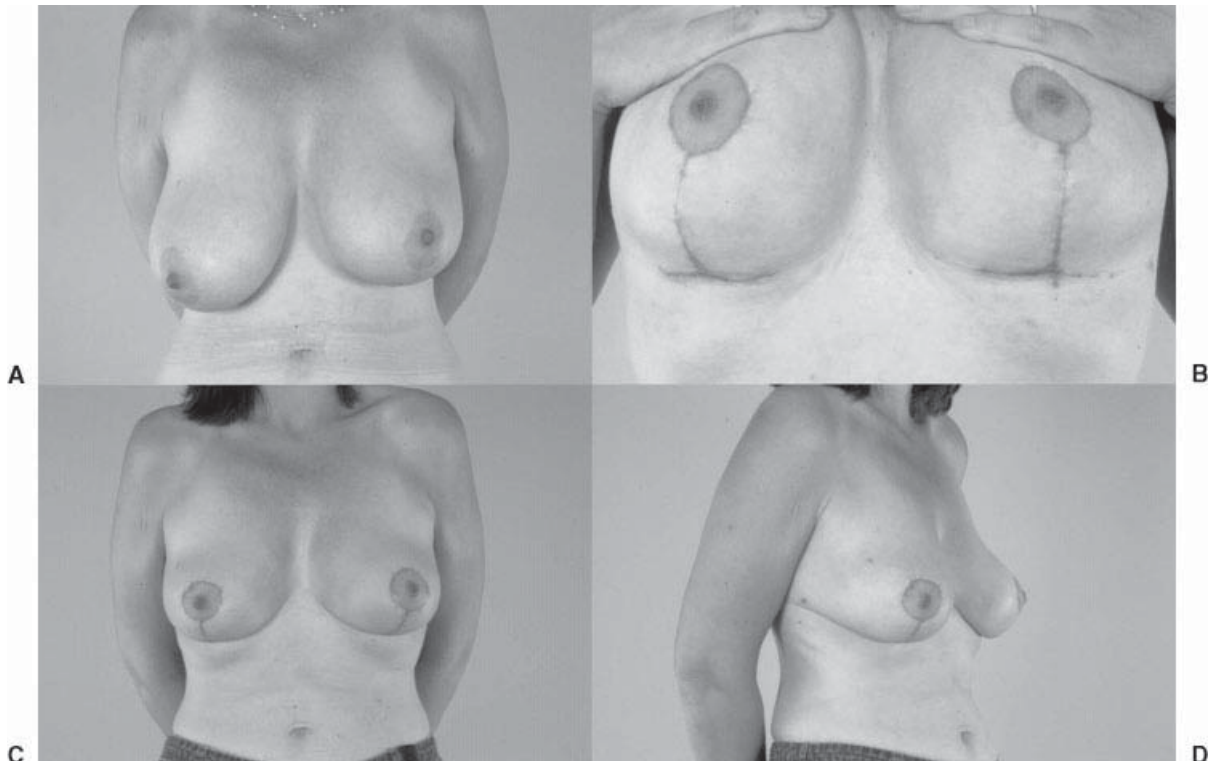


Figure 5 Pre- and postoperative views of a 37-year-old patient after 600-g reduction. Note short horizontal scar.

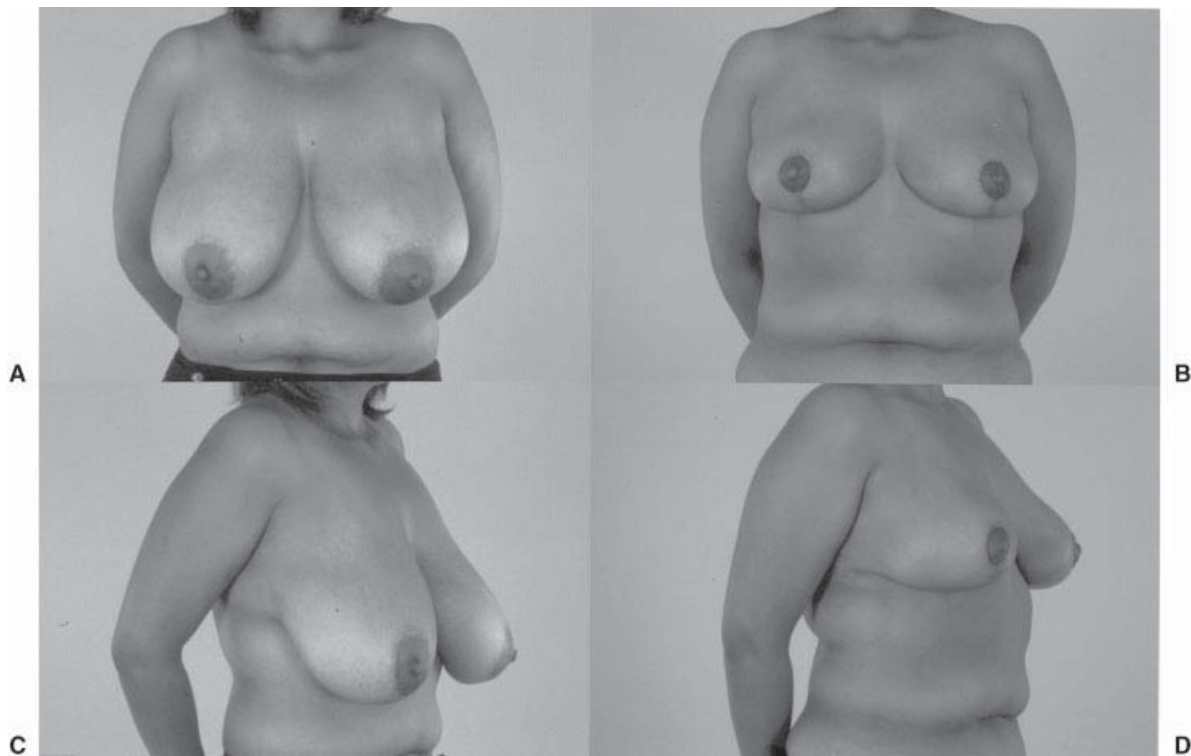


Figure 6 Pre- and postoperative views of a 29-year-old patient after 700-g reduction.

requires dramatically less de-epithelialization than the inferior pedicle technique, thereby decreasing operating room time, yet leaving a pedicle that does not interfere with managing the vertical skin excision. It provides reliable superomedial fullness and sensation to the nipple-areolar complex through its physiologic design, relying on medial intercostal perforators and feathering laterally to pick up the medial and lateral rami from the lateral intercostal nerves. This technique provides superior medial fullness by using that region as the pedicle, thereby reducing “bottoming out” by supporting the reduction superiorly. It provides considerable flexibility in design, allowing the addition of a shortened transverse scar as necessary to deal with skin excess. Unlike techniques that suture medial and lateral pillars together, this technique looks natural on the operating table and reduces the period of time necessary to achieve a stable postoperative result.

There are a few potential concerns with this procedure: The circumareolar closure may leave postoperative puckering that may require time to resolve, and there is the risk of palpability or exposure of the blocking suture. As the majority of the parenchymal breast excision removes tissue from the inferior lateral aspect of the breast, the operation leaves a potentially thin lateral flap; this requires some care in resection of the lateral inferior quadrant to ensure that the flap is not compromised.

The superomedial reduction procedure as described herein is a reliable technique composed of three key components:

1. a superomedial full-thickness dermoglandular pedicle;
2. a circumareolar purse-string closure; and
3. a vertical skin excision with the option of a shortened transverse scar as necessary.

REFERENCES

1. Hall-Findlay EJ. A simplified vertical reduction mammoplasty: shortening the learning curve. *Plast Reconstr Surg* 1999;104:748-759
2. Lassus C. A 30-year experience with vertical mammoplasty. *Plast Reconstr Surg* 1996;97:373-380
3. Lejour M. Vertical mammoplasty and liposuction of the breast. *Plast Reconstr Surg* 1994;94:100-114
4. Hammond DC. Short scar periareolar-inferior pedicle reduction (SPAIR) mammoplasty. *Operative Techniques in Plastic and Reconstructive Surgery* 1999;6:106
5. Hammond DC. Short scar periareolar-inferior pedicle reduction (SPAIR) mammoplasty. *Plast Reconstr Surg* 1999;103:890-901
6. Marchac D, de Olarte G. Reduction mammoplasty and correction of ptosis with a short inframammary scar. *Plast Reconstr Surg* 1982;69:45-55
7. Asplund OA, Davies DM. Vertical scar breast reduction with medial flap or glandular transposition of the nipple-areola. *Br J Plast Surg* 1996;49:507-514
8. Spear SL, Howard MA. Evolution of the vertical reduction mammoplasty. *Plast Reconstr Surg* 2003;112:855-868
9. Weiner DL, Aiache AE, Silver L, Tittiranonda T. A single dermal pedicle for nipple transposition in subcutaneous

- mastectomy, reduction mammoplasty, or mastopexy. *Plast Reconstr Surg* 1973;51:115-120
10. Orlando JC, Guthrie RH Jr. . The superomedial dermal pedicle for nipple transposition. *Br J Plast Surg* 1975;28:42-45
 11. Hauben DJ. Experience and refinements with the superomedial dermal pedicle for nipple-areola transposition in reduction mammoplasty. *Aesthetic Plast Surg* 1984;8:189-194
 12. Hauben DJ. Superomedial pedicle technique of reduction mammoplasty: discussion. *Plast Reconstr Surg* 1989;83:479
 13. Finger RE, Vasquez B, Drew GS, Given KS. Superomedial pedicle technique of reduction mammoplasty. *Plast Reconstr Surg* 1989;83:471-478
 14. Shin KS, Chung S, Lee HK, Lew JD. Reduction mammoplasty by central pedicle flap with short submammary scar. *Aesthetic Plas Surg* 1996;20:69-76
 15. Mofid MM, Dellon AL, Elias JJ, Nahabedian MY. Quantitation of breast sensibility following reduction mammoplasty: a comparison of inferior and medial pedicle techniques. *Plast Reconstr Surg* 2002;109:2283-2288
 16. Courtiss EH, Goldwyn RM. Breast sensation before and after plastic surgery. *Plast Reconstr Surg* 1976;58:1-13
 17. Craig RDP, Sykes PA. Nipple sensitivity following reduction mammoplasty. *Br J Plast Surg* 1970;23:165-172
 18. Farina MA, Newby BG, Alani HM. Innervation of the nipple-areola complex. *Plast Reconstr Surg* 1980;66:497-501
 19. Benelli LC. Periareolar Benelli mastopexy and reduction: the "round block". In Spear SL, ed. *Surgery of the Breast: Principles and Art*. Philadelphia: Lippincott-Raven; 1998: 685-696