# Improving Safety and Aesthetic Results in Inverted T Scar Breast Reduction

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Breast reduction using an inverted T scar skin design and a variety of glandular pedicle types is widely practiced and is the standard by which more recent limited scar techniques are judged. The inverted T procedures are attractive because they are predictable and versatile and permit great control over both the extent of reduction and the breast-shaping process. Despite these advantages, common criticisms of inverted T scar techniques include breast shape abnormalities, areolar malposition, hypertrophic scars, and poor long-term projection.

Preoperative markings influence both safety and aesthetics. A method of skin marking that is based on a displacement method to determine vertical limb splay angle is described. This design concept must be modified to address certain variants, such as macromastia presenting with normal nipple position or large-diameter areolae, moderately severe macromastia, and macromastia involving radiated breasts.

Safety in breast reduction is improved by paying attention to patient positioning issues, using techniques that minimize blood loss, raising flaps of appropriate thickness in the correct plane, and performing resection by observing the principles that reduce the risk of compromise of nipple and areolar circulation. Aesthetic results are improved by analyzing vertical breast meridian lengths during final breast shaping, modifying areolar shape as necessary, and carefully tailoring the medial inframammary crease. The latter is also important for minimizing the potential for scar hypertrophy.

The principles presented have been refined during the course of a 12-year experience with several hundred breast reduction procedures. They contribute to improved results in inverted T scar breast reduction when practiced consistently. (*Plast. Reconstr. Surg.* 103: 874, 1999.)

Breast reduction has been performed traditionally by using various methods that result in an inverted T scar pattern. Pedicle types include superior, inferior, central, lateral, and bipedicle.[1–7] Criticisms of these procedures include long-term loss of projection with development of lower pole fullness, problems resulting from hypertrophic inframammary crease scars, and an excessive scar burden in general. However, inverted T scar methods have the greatest versatility in terms of applicability to all types and degrees of macromastia, for which they yield consistent and predictable results. Inverted T scar methods remain the standard against which newer methods must be judged.

The appeal of conventional T scar approaches is that they allow for total control of skin envelope shape; precision in glandular resection because of wide exposure of the gland (inferior and central pedicle methods); and complete control of areolar position, diameter, and shape (when using a closed skin design). Tissue loss is rare with proper operative design, and the method is the easiest to master. However, flawed design concepts and lack of attention to detail result, at best, in an average result and, at worst, in either major tissue loss or a severely compromised aesthetic result. These patients often present as candidates for secondary surgery (Fig. 1).

The purpose of this article is to elucidate the key concepts important for both safety and achieving optimal aesthetic results in breast reduction. Complete mastery of inverted T scar methods is a prerequisite for successfully adopting more intuitive, limited scar methods of breast reduction and understanding the best indications for them. A conventional inverted T scar approach with an inferior or central pedicle will be used to illustrate important points because it is probably the most widely used technique at present. However, all of the skin design concepts and most of the other principles discussed are applicable to superior

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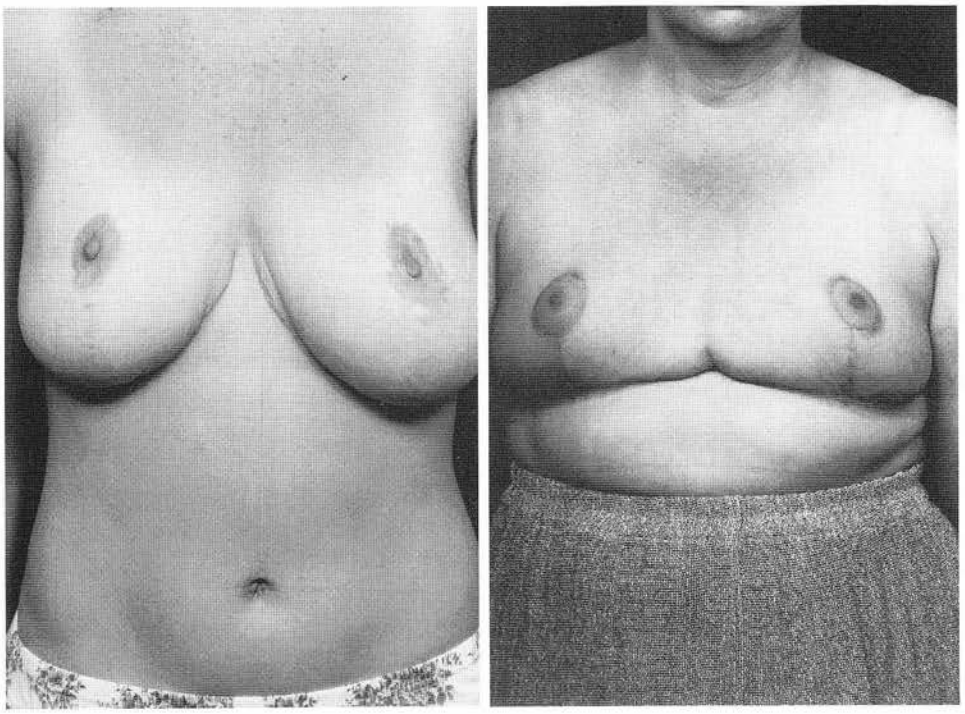

FIG. 1. Poor aesthetic results usually result from poor preoperative design. (*Left*) This result is characterized by a skin envelope that is too large, poor areolar shape and areolar malposition, and poor tailoring of the medial inframammary crease incision. (*Right*) This result was most likely predetermined by a skin envelope that was designed too tight. Glandular over-resection was then necessary because of a skin shortage. There is evidence that part of the design problem stems from a nipple position that was planned too high.

and superomedial pedicle procedures. These latter alternatives are attractive because they can be performed more efficiently and may retain better long-term projection.[8–13]

## MATERIALS AND METHODS

The concepts presented and discussed in this article are based on a 12-year experience with 251 reductions performed for both aesthetic and reconstructive purposes. The vast majority of the reductions were inferior or central pedicle types, although superior pedicle and vertical scar mammaplasty were more commonly used in the last year of the study period. A poor experience with the circumareolar approach described by Benelli resulted in abandonment of that particular technique. Free nipple graft breast reductions were performed in only three patients.

### *Inverted T Scar Skin Design*

Inverted T skin design is usually drawn as a "closed" pattern, which means that the location and size of the areolar opening are determined after the breasts are reduced and the incisions are approximated. A closed design is possible because there is usually both sufficient ptosis and a normal areolar diameter, so the vertical limbs can be drawn as desired, without the prospect of intersecting the areolar skin edge. An "open" design is required when the nipple position is high or the areolar diameter is overly large. Macromastia variants that require an open design will be discussed separately.

An inverted T skin pattern of the closed type can be designed reliably on the breast by a free-hand method based on breast displacement to accurately determine the splay angle of the vertical limbs. Previous descriptions that rely on mechanical aids or rigid geometric analysis are not as accurate.[3,14–16] The first step is to mark the middle breast meridian on the inframammary crease and then mark the position of the nipple in line with this and at the same level as the inframammary crease.[3,7,16] In certain situations (described later), the new nipple position may be 1 cm above to 2 cm below the inframammary crease level, depending on the relative amounts of skin and glandular volume that exist. Previous descriptions that advocate using arbitrary nipple-to-clavicle

measurements or other fixed points (such as the midhumerus) to determine the nipple location are not reliable and may result in malposition of the nipple and areola.[15,17]

Step two is to grasp the skin of the lower breast and displace the gland laterally enough to simulate the desired shape of the medial half of the breast (Fig. 2). A reference point is then marked near the bottom of the breast that lies on a line determined by the nipple mark and the middle meridian mark. The breast is then released and, beginning at the nipple, a straight line is drawn, 7 cm in length, that passes through the displacement-determined reference point.

Step three is to draw a second vertical limb by displacing the breast medially enough to simulate the desired lateral breast shape. The same steps just described for marking the medial vertical limb are then followed. The displacement method accurately determines the proper splay angle of the vertical limbs that will result in the correct amount of skin resection in the vertical dimension. In most cases, the endpoints of the vertical limbs are 10 to 11 cm apart when measured with the patient standing.

The final step is to draw the horizontal limbs medially and laterally. The upper limbs should be drawn with a gentle upward curve in most cases to equalize the lengths of the vertical breast meridians. This is not done because of concerns that the upper limbs and the inframammary crease incision length need to "add up," a previously described concept that is obsolete and not relevant.[13,15] A slight curve will help avoid a boxy final shape. In very large breasts, this principle is less important, and the upper limbs are drawn more as a straight line. The length of the limbs should not extend as

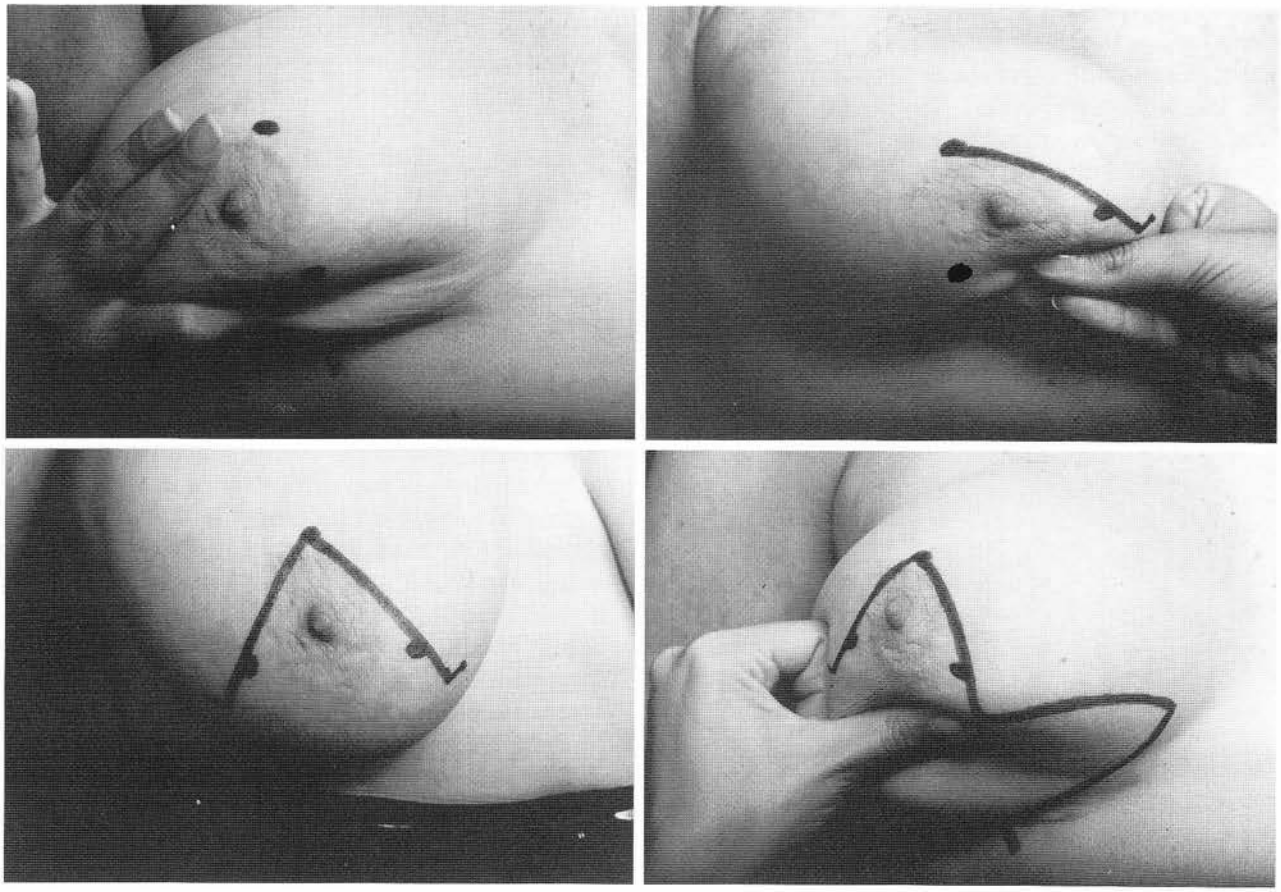

FIG. 2. Skin markings for the breast displacement method. (*Above, left*) The breast is displaced laterally enough to simulate ideal medial breast shape. A mark is made along a line connecting the new nipple position (*top dot*) with the midbreast meridian point on the inframammary crease (*lower dot*). The breast is released, and a 7-cm line is drawn along the line determined by the new nipple position mark and the displacement-determined mark. (*Above, right*) The breast is then displaced medially by the desired amount, and a mark is made for the second vertical limb. The breast is then released, and a second 7-cm line is drawn. (*Below, left*) The completed vertical limb design is shown. (*Below, right*) Note that the horizontal limb design does not extend as far as the end of the inframammary crease and lies above it at its endpoint.

far medially and laterally as it is possible to draw them because the inframammary crease endpoints cannot be accurately located preoperatively. Final tailoring of excess skin at the end of the procedure with the patient in the sitting position finalizes the skin incision design with the greatest degree of precision. It is also important to raise the endpoint of the horizontal limbs above the inframammary crease medially and laterally.[6] Otherwise, the final scar could diverge downward from the line of the inframammary crease.

The amount of skin resected in the horizontal dimension is related in part to the height of the nipple mark. A nipple mark that is positioned above the inframammary crease will remove more skin in the horizontal dimension than a nipple position that lies below the inframammary crease. A useful way to confirm the correct amount of horizontal skin excision is to examine the breasts after marking with the patient in the supine position. The horizontal limb lines should lie inferior to the equator of the breast, as the breast is vertically centered on the chest wall (Fig. 3). If the horizontal limbs are above the equator, they should be lowered by adding approximately 1 cm to the end of the vertical limb and drawing new lines. It may be necessary to lower the previously determined nipple position in cases in which greater horizontal limb correction is necessary.

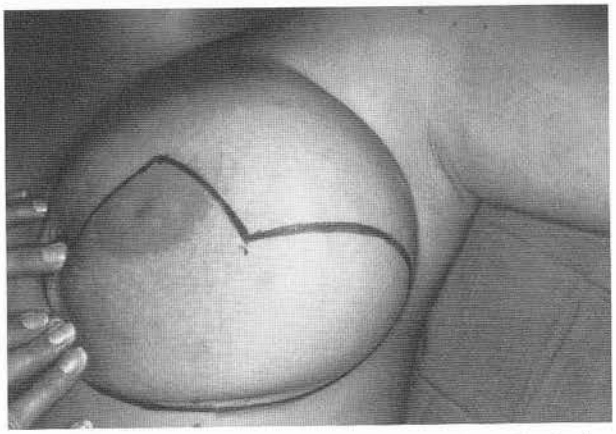

FIG. 3. Note that the horizontal limbs of the skin design in this patient correctly lie below the equator of the breast as it is defined with the breast centered on the chest wall with the patient in the supine position. When the horizontal limbs lie above the equator, the amount of skin excised will be more than 50 percent of the vertical circumference of the breast. This is excessive and, if not adjusted, will dictate glandular over-resection to accommodate a tight skin envelope (with possible development of hypertrophic scars, too). The skin design must be revised by lowering the horizontal limbs (and possibly the new nipple position as well).

*Design Variants*

*Macromastia with large-diameter areolae.* Some patients present with large-diameter areolae and insufficient ptosis to allow a conventional closed-pattern T-incision design. The T-incision skin design in these cases is altered by planning an intra-areolar excision of excess skin in conjunction with the usual displacement method to determine the vertical limb splay angle (Fig. 4). A circumareolar incision and an interior areolar incision whose diameter is determined by a template (usually 42 or, less commonly, 38 mm) are marked. The vertical limbs are made 5 cm in length, given the open areolar design.

If there is some ptosis present, the circumareolar incision must extend higher than the existing areolar skin edge, from approximately the 10 o'clock to the 2 o'clock position, so that partial closure of the areolar opening with a dermal pursestring suture will both decrease its circumference and raise the opening slightly. Otherwise, nipple position may be too low. Pursestring closure of the large areolar opening does not guarantee a perfectly round circle. After tightening it down to the desired diameter, it is almost always helpful to trim portions of the circumference to restore an evenly round shape.

*Macromastia with normal nipple position.* Occasionally, macromastia may be present without any breast ptosis. Although this may represent an excellent indication for a vertical scar method, conventional T-incision design is very compatible with this situation. An open design is required, because existing areolar location precludes use of the usual closed design, where the areolar location is determined after incision closure. The markings skirt the top of the existing areola to avoid raising the nipple position. The opening is drawn wider than the existing areola, as if the round opening were hinged in the 12 o'clock position. The areolar opening will become a circle once the vertical limbs are approximated.

The splay angle of the vertical limbs is determined by the same breast displacement method described previously. However, like the large-areola variant described above, the vertical limbs are made 5, not 7, cm in length because an open areolar design is used.

A circumareolar pursestring suture is sometimes useful in these cases. The final areolar opening may be "out of round" when the vertical limbs are approximated, simply because

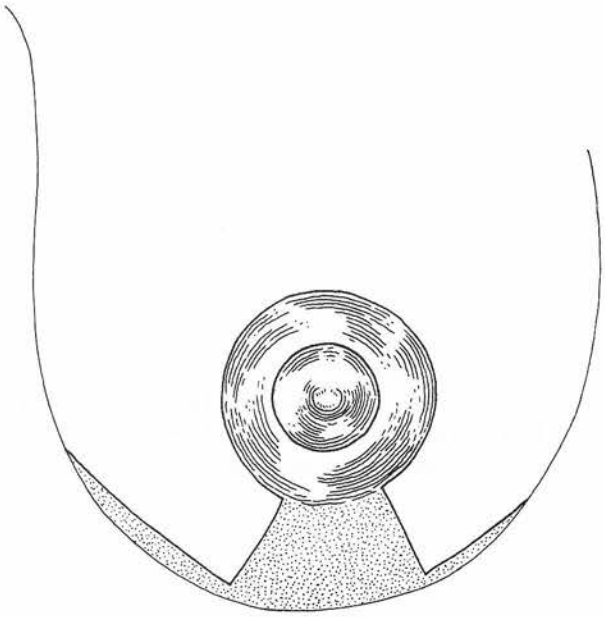

FIG. 4. Large diameter areolae in breasts with little or no ptosis require a modification in skin marking design. An intra-areolar excision is planned in these cases. Vertical limb splay angle is determined by the breast displacement method, but 5-cm limb lengths are drawn. A pursestring suture is usually required to decrease the areolar diameter sufficiently during closure.

open areolar design is inherently less precise. Placement of a pursestring suture will improve the shape of the opening in conjunction with minor skin trimming as required to form a circle.

*Moderately severe macromastia.* Macromastia with nipple-clavicular distances up to 40 cm and breast volumes up to 2500 g per side can be performed without using free nipple grafts. Breasts of this type have the same configuration in the supine position as more modest cases of macromastia, except that the overall scale is proportionately larger. This means that the same approach to T-scar incision design and pedicled nipple transposition can be used with only slight modification. The design parameters need to be relaxed somewhat to accomplish this. The most important considerations are not to make the skin design too tight by using the standard convention of 7-cm vertical limbs in the initial skin design. Instead, increasing limb length to 8 (or even 9) cm prevents the need for excessive glandular removal later to accommodate an overly tight skin design.

Because the breast will be proportionately larger after reduction compared with an average reduction case, the areolar diameter should be planned proportionately larger. This will make the areola look more appropriate for the final breast size. Equally important, it will make nipple transposition on a longer pedicle more reliable because the blood supply to a larger diameter areola is, presumably, better.

The advantages of this method are that nipple sensation may be preserved and the possibility of either incomplete free nipple graft take or areolar depigmentation is avoided.[18] The disadvantages are that the procedure takes significantly longer than the free nipple graft alternative, the pedicle must be folded on itself to properly locate the areola, and the breasts often have more residual volume compared with what is possible with a free nipple graft method. Relief of symptoms is reliably provided with this variation on the standard method, however.

The free nipple graft method remains a useful one and is probably the procedure of choice when nipple-clavicular distances approach 45 cm and breast volume exceeds 3000 g.[19–21]

*Radiated breasts.* Occasionally, a patient with macromastia and breast cancer previously treated by lumpectomy and radiation will seek a breast reduction.[22] Lumpectomy scars located more than 2 cm away from the areolar edge are usually compatible with a conventional T-incision design for reduction. Like cases of moderately severe macromastia, it is important to relax the skin design parameters to ensure safety. The design should not be planned as tight as the usual breast displacement marking technique allows. The areolar diameter should be planned slightly larger to preserve maximum blood supply.

During dissection, the skin flaps should be raised thicker than normal and not elevated as extensively. Resection should be more conservative than in a comparable nonirradiated case.

Cases in which the lumpectomy scar is periareolar in location are more problematic. Postradiation scarring and fibrosis in close proximity to the areola can adversely affect its blood supply when it is isolated on a pedicle. Partial areolar loss can occur, despite great care in planning. Wound closure by secondary intention is extremely protracted in these cases.

An alternative to the less-predictable situation of postradiation reduction is to perform a reduction at the time of lumpectomy. This is not a widespread practice today, nor is it a foolproof concept. More extensive disease

found in the reduction specimen may require a complete mastectomy, and there is the possibility of skin loss if the flaps are thinned and more extensively undermined than usual.

*Set-up for Surgery*

If breast volume is less than 2000 g per side and the breasts are not overly wide, the patient's hands can be positioned on her lap instead of abducting the arms on armboards. This may decrease the possibility of neurapraxia injuries and increase the accuracy of the breast shaping because there is no distortion caused by arm position. After the glandular resection is complete and the incisions are partially closed, the remainder of the procedure (areolar positioning and breast shaping) is performed with the patient in the sitting position. This will contribute to improved aesthetic results, although there are also ventilatory benefits.[23] It is best to pad the forehead and tape it to the table and later place the table in a flexed position with the feet down before sitting the patient up. Pneumatic calf compression boots and a warming blanket are routinely used.

It is not necessary to transfuse patients who undergo breast reduction if flap elevation and glandular excision are performed with a bovie. Use of this method usually requires high settings to be efficient. Either a smoke evacuator or a no. 14 French anesthesia suction catheter slipped over the tip of the bovie and hooked to wall suction is recommended to minimize exposure to noxious fumes. Injection of the breast has been established as an alternative method for avoiding the need for transfusion.[24–26] However, injection with solutions containing epinephrine may impair accurate breast volume assessments and, possibly, increase the risk for postoperative hematoma.

*Initial Dissection*

The procedure is performed almost entirely from one side of the table by rolling the table from side to side to center each breast on the chest wall for skin flap elevation and glandular resection. After it has been confirmed that the skin design is not overly tight, the pedicle is drawn for inferior pedicle reductions. It should not be designed to lie closer than a radius of 2 cm from the areolar edge. Although it is not necessary to specify the width of the base of the pedicle by a specific measurement, it should represent roughly half of the total inframammary crease incision length.

The areolar diameter is generally cut larger than the diameter of the opening that will be made in cases with a closed type of skin design. In most instances, a diameter of 42 mm is an appropriate initial template diameter for either an open or closed skin design. Larger initial template diameters may be indicated for cases of more severe macromastia, as described previously.

The pedicle skin can be removed by either complete excision or deepithelialization. Neither method has been proven superior to the other by any criteria.[27] It may be wise to leave a small amount of deepithelialized skin at the base of an inferior or central pedicle design to facilitate healing in the event a small slough should develop at the confluence of the T scar incisions postoperatively. Others have recommended incorporating a dart of skin into the inframammary incision to reduce tension in this area, but this is, for the most part, unnecessary.[28,29] In superior pedicle designs, it is helpful to leave a deepithelialized tab of tissue several centimeters inferior to the areola, primarily to avoid excessive flatness of the lower breast.

*Skin Flap Elevation*

The skin is raised to expose the entire gland in inferior or central mound designs. Although time-consuming, this facilitates and increases the precision of the glandular resection. The flaps are best raised along the plane that lies between the breast tissue and the subcutaneous fat. This plane can be well defined, although it is sometimes vague. In the young patient, it is generally more discernible. Elevating the skin flap in the right plane will preserve maximum blood supply and also save time later by avoiding the need to thin flaps to obtain more resection volume.

The tips of the skin flaps are deliberately made thick (at least 1 cm) to ensure viability. It is most efficient to first raise the flap medially and laterally, alternating skin hooks on the tips of the flaps while another one is positioned at the confluence of the vertical limbs.[7] The hooks are then shifted to the midpoint of each vertical limb, and the central portion of the flap is raised (Fig. 5). The entire extent of the gland is now exposed (Fig. 6).

It is important during skin flap elevation to avoid exposure of the pectoralis muscle around the base of the glandular pedicle. This will preserve blood supply to the skin flap and

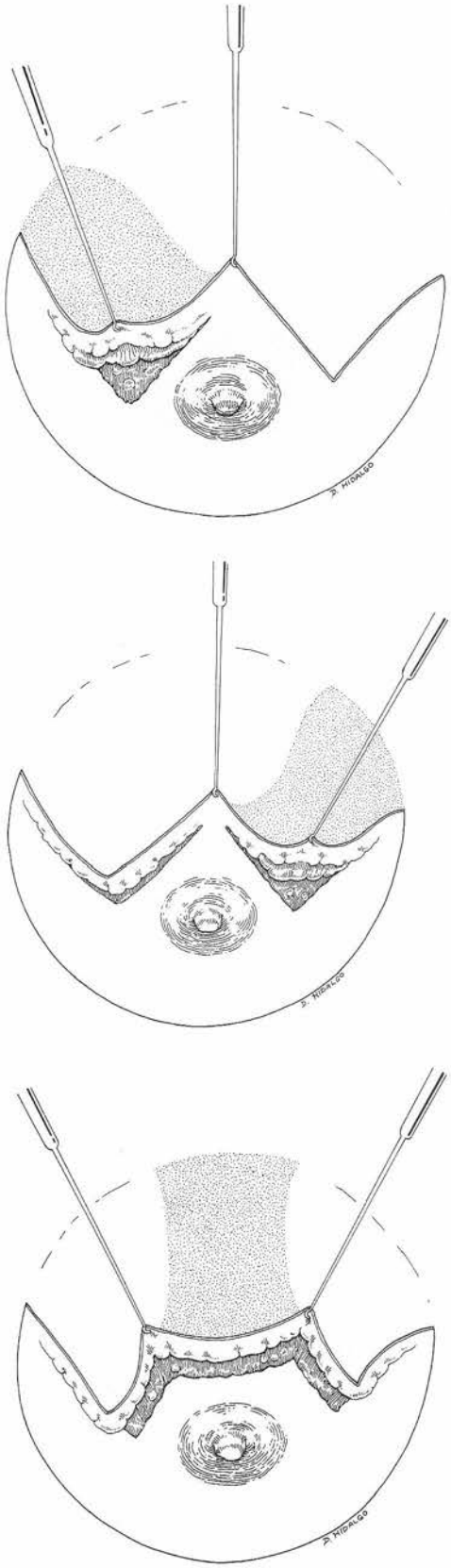

FIG. 5. Skin flap elevation with inferior/central pedicle design. Skin flaps can be efficiently and safely elevated by placing skin hooks as shown. (*Above*) One side is elevated first (*stippled area*), and then the skin hook on that side is shifted to the opposite flap tip. (*Center*) The opposite side is then raised, and then both skin hooks are moved to the center of the vertical limbs. (*Below*) The central portion of the flap is then raised over the gland.

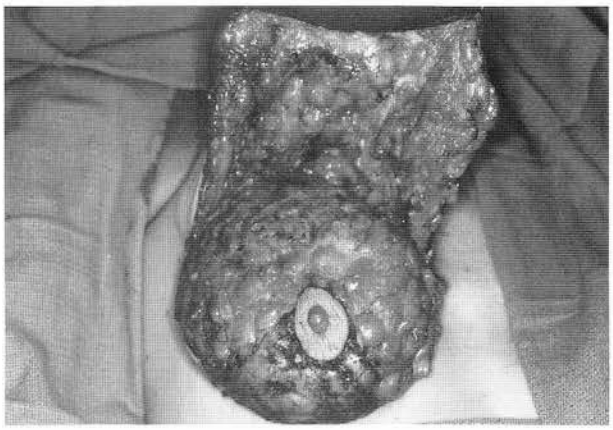

FIG. 6. The entire gland is exposed after skin flap elevation. This allows for great precision in glandular resection.

gland and protect sensation to the nipple.[6] It is also best to preserve a soft-tissue connection between the gland and skin in the upper inner quadrant of the breast. This will help avoid flattening in this area caused by over-resection. It also preserves blood flow to the gland from the large second intercostal space perforator, which is commonly present.

Skin flap elevation is far less problematic with superior pedicle designs because far less undermining is necessary. Usually, the tips of the flaps and a portion of the skin in the region of the new nipple location still require elevation (as described above).

*Glandular Resection*

Glandular resection with an inferior pedicle technique consists of lateral, superior, and medial segments in descending order of amounts removed. The operating table remains rolled to the opposite side, and resection of each area is performed with an assistant stabilizing the gland so that inward bevel of the pedicle is avoided as tissue is removed. As with skin flap elevation, resection does not extend deep enough to expose the pectoralis muscle in any portion of the breast. Lateral resection must be adequate enough to eliminate breast fullness in this area, a priority issue for most patients. Medial resection is generally minimal. A bridge of tissue connecting the superomedial portion of the breast with the pedicle is often left intact. This will both contribute to a full shape in

this area and preserve the usually prominent internal mammary branches from the second intercostal space. Superior resection should not encroach on the nipple or undercut the pedicle. Resection in superior pedicle designs can often be accomplished as a single excision, incorporating the lower pole of the breast with a lateral extension.

Manipulating the pedicle by folding it or suturing it to the chest wall to enhance and maintain projection has been advocated by some.[30,31] However, this has not been conclusively shown to be of value as a general practice.

Trial closure of the incisions is an empiric but useful method to determine the endpoint of glandular resection. The closure should not be under great tension (under-resection), nor should the breast look flat, either superiorly or medially (over-resection). Glandular volume and skin design can be matched carefully so that the breast shape is full within the downsized skin envelope, but the fit is not so tight as to result in a greater potential for hypertrophic scar formation.

*Final Shaping and Closure*

Temporary closure of the T incision is performed to assess the adequacy of resection and to confirm volume symmetry. The incisions are then reopened, hemostasis is confirmed, and drains are placed, which will exit the lateral part of the inframammary crease incision. The vertical component of the T incision can then be definitively closed with interrupted dermal sutures, but the inframammary crease incision is again temporarily closed with staples pending final shaping of the skin envelope.

The patient is placed in the sitting position, and the areolar position is marked. The usual

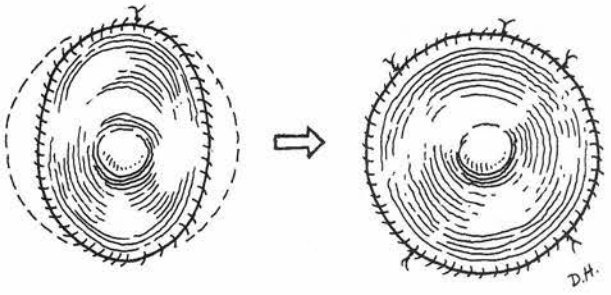

FIG. 7. (*Left*) Initial areolar closure often reveals oval or irregular shape. (*Right*) Closure with a running suture facilitates efficient revision of shape. The suture is backed out and replaced only along portions of the circumference where small amounts of skin excision will contribute to improved shape.

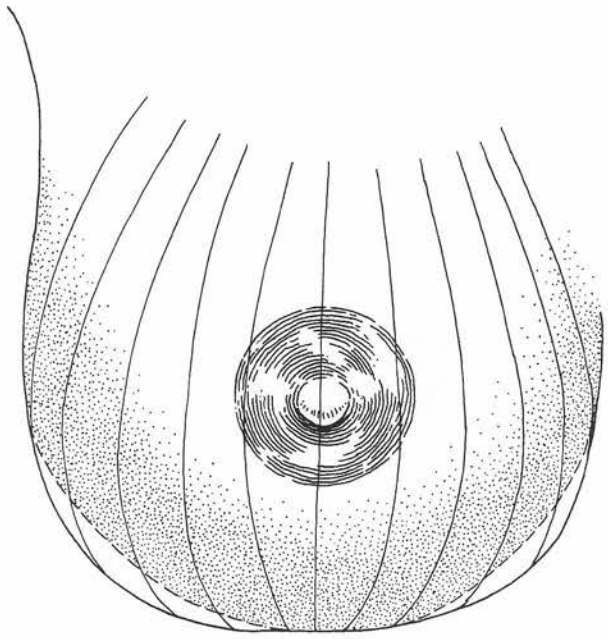

FIG. 8. Breast meridians. Analysis of the meridians that define the vertical skin length in different sectors of the breast will disclose where excess tissue needs to be removed to establish an ideal shape of the lower pole of the breast. A boxy shape requires that the meridians lateral to the nipple on each side be shortened to create the preferred shape (illustrated by the *dotted line*).

measurement is 4.5 cm above the inframammary crease, although it can be slightly more or less, depending on the overall breast proportions. The new areolar diameter should be individualized and not always arbitrarily determined by template measurements. It can be more accurate to draw a circle than to use templates in some cases. The areolae are sutured in two layers, and it is best to complete the closure with a continuous suture. This suture can be backed out over whichever portion of the circumference may prove to be distorted. Excess skin is trimmed as necessary to create an evenly round areolar shape. This maneuver does not take a great deal of time, and it contributes to an improved final result (Fig. 7).

Final shaping of the skin envelope is achieved by adjustments at the inframammary crease, which bring into harmony all of the longitudinal meridian lengths. The method of skin marking previously described is relatively, but not absolutely, accurate, and adjustments are almost always required to achieve the best possible shape. It is often necessary to trim skin medial and lateral to the middle breast meridian to avoid a boxy shape (Fig. 8). It also often proves necessary to trim the inferior corners of

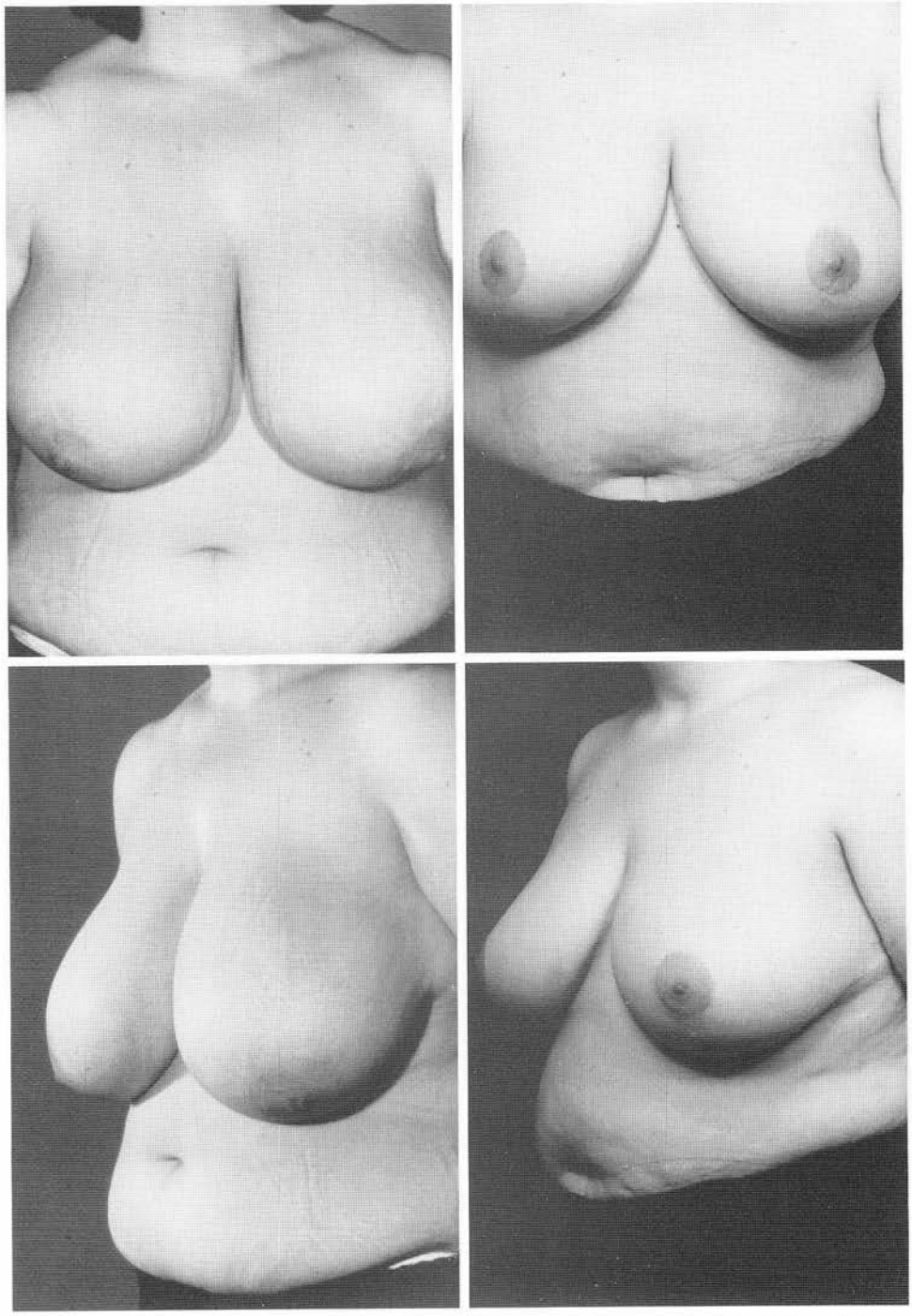

FIG. 9. An example of a moderately large reduction is shown preoperatively (*left*) and 3 years postoperatively (*right*). A total of 868 g was removed from the right breast and 886 g from the left breast. Particular attention to detail is important when contouring the medial portion of larger breasts.

the underlying pedicle because a wide pedicle may also contribute to shape imperfections.

The lateral dog ears are usually minor and do not require much skin excision. Axillary fullness can be treated with liposuction. Accurate tailoring of the medial dog-ear is critical to establish the best possible contour and to prevent hypertrophic scar formation in this area. The bigger the medial dog-ear (the more underdrawn the original medial markings), the greater the opportunity for precise contouring. Excess skin is first incised along the inframammary crease, and then the upper flap is cut so that there is absolutely no tension on the clo-

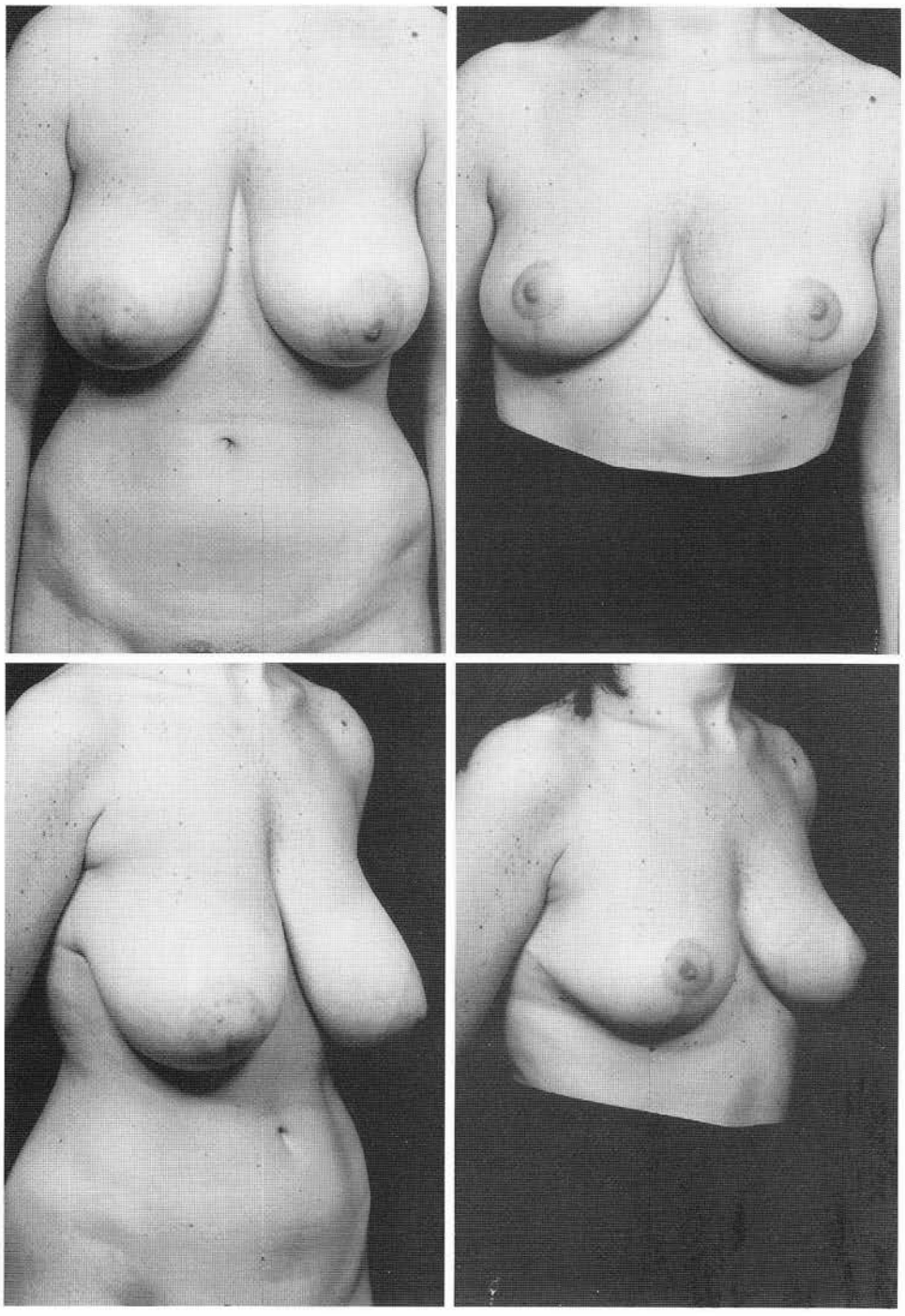

FIG. 10. An example of an average size reduction is shown preoperatively (*left*)and 1 year postoperatively (*right*). A total of 435 g was removed from the right breast and 456 g from the left breast.

sure. It is almost always necessary to carefully debulk the underlying parenchyma in this area to establish optimal contour. Slight longitudinal tension along the incision during suture placement often adds a small amount of additional contour improvement and may also contribute to a decreased tendency for hypertrophic scar formation. Final skin closure is performed using two layers of buried absorbable sutures.

Patients are placed in a surgical bra at the completion of the procedure. Postoperative care is minimal: drains are usually removed the next day and areolar sutures after 5 days.

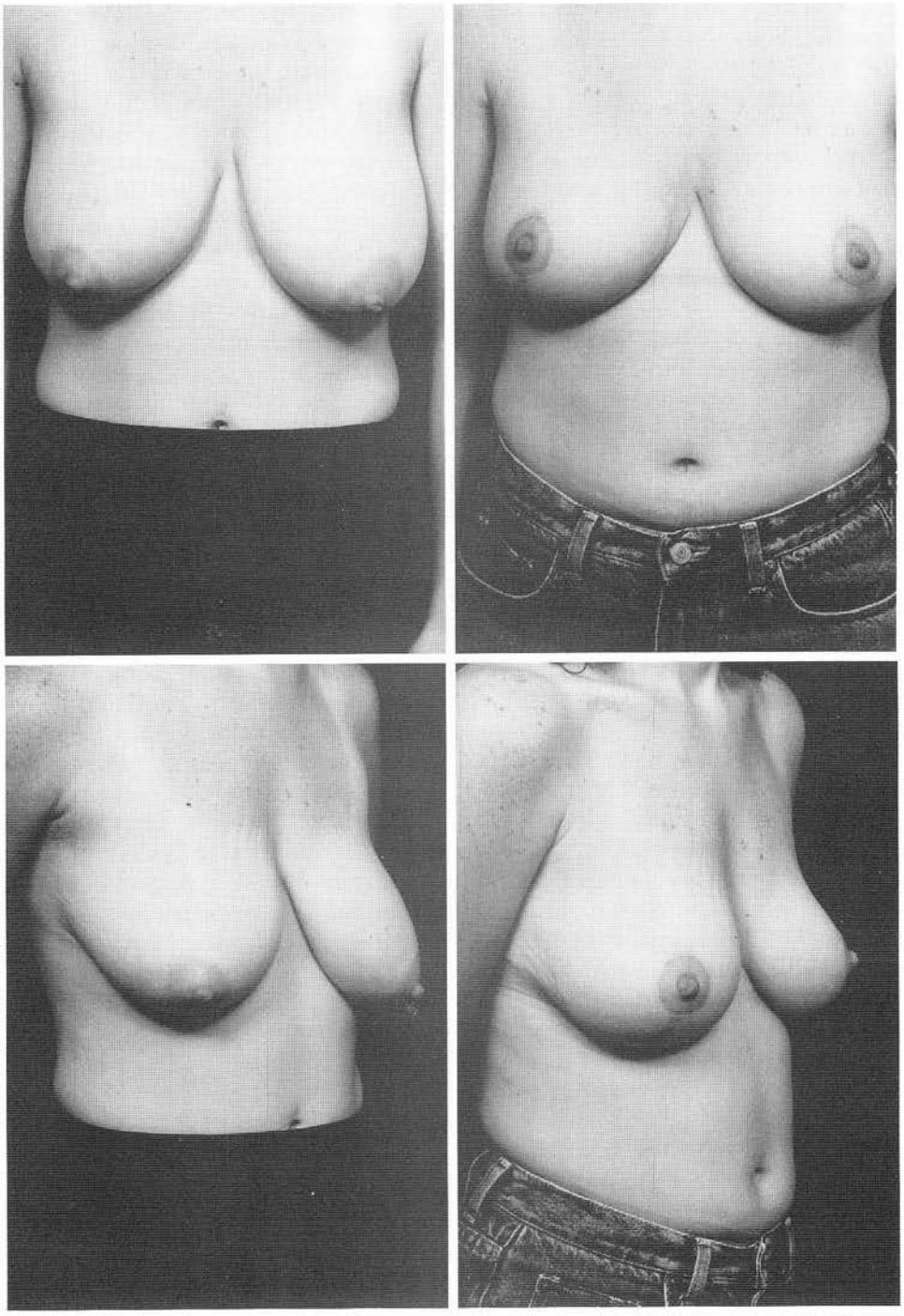

FIG. 11. An example of a minimal reduction (mastopexy) is shown preoperatively (*left*) and 18 months postoperatively (*right*). A total of 75 g was removed from the right breast and 142 g from the left breast. The principles of skin design are the same for this type of patient, except that the degree of breast displacement (and therefore the vertical limb splay angle) should be less given that the planned volume reduction is minimal.

## RESULTS

These techniques have been used in 251 patients who were treated between 1986 and 1998. Reduction volumes ranged from 47 to 3465 g per breast, although the majority of cases ranged from 300 to 600 g. Complications have been few and rarely required a return to the operating room. The most common complication was minor dehiscence at the confluence of the incisions, which invariably resolved

within 1 month with conservative management. Other problems included partial areolar skin loss in two patients, complete areolar loss on one side in a free nipple graft patient, under-reduction in five patients, over-reduction in two patients, and hypertrophic scars in four patients. Breast sensibility, overall patient satisfaction, and other issues that were not the focus of this study were not specifically reviewed. Both aesthetic results and procedure safety continued to improve throughout the series as the methods described became consistently employed. Representative examples of results are shown in Figures 9 through 11.

## DISCUSSION

Matching skin envelope design with the extent of glandular resection is the most basic requirement for success using inverted T scar methods for breast reduction. Precise tailoring of the breast skin meridians at the inframammary crease is important beyond this to achieve optimal shape and minimize the potential for scar hypertrophy. Nuances involved in areolar placement and shaping further enhance the quality of the aesthetic results. There are also numerous small technical details that increase safety, improve efficiency, minimize blood loss, and contribute to improved results.

Limited scar techniques have become more popular recently. The vertical scar technique described by Lassus[32] and developed further by Lejour[33] is an appealing alternative. It has the promise of a decreased scar burden and improved long-term projection. Experience to date suggests that it is a less versatile method, even in experienced hands. The nature of the scar-limiting skin design makes precision in matching the skin envelope to the final breast volume less precise and, therefore, a more intuitive process. Its use in large-volume reductions is associated with incomplete control over the skin envelope, which may require secondary revisions for optimal results. Despite these drawbacks, this technique may prove to be uniformly superior to inverted T scar methods in small- to average-volume reductions (500 g or less per side) or for larger volume cases that do not have significant ptosis.

The periareolar method modified and advocated recently by Benelli[34] and Felicio[35] produces the least amount of scar. Its chief indication has been for mastopexy, although it has been recommended for small-volume reductions as well. It is not intended to be used for large-volume reductions or cases of excessive (grade III) ptosis. Removal of excess skin by a periareolar approach has two inherent limitations. First, it flattens the breast, despite elaborate and invasive manipulation of the parenchyma in an attempt to overcome this effect. Second, the tension on the periareolar scar often results in poor scar quality and distortion of the areolar shape, widening of areolar diameter, and undesirable changes in areolar texture. This latter problem is not remedied in a consistent or predictable fashion by the placement of a pursestring suture, itself a foreign body that has a small extrusion risk. Besides selected mastopexy indications, this procedure is ideally suited to cases of tubular breast formation with hypertrophy. A periareolar resection and pursestring closure have a beneficial effect on the widened and herniated areolae characteristic of these cases. However, it has not achieved popularity as a general method of breast reduction.

Breast reduction using an inverted T scar method currently remains the best method for achieving optimal results for a wide variety of macromastia types. The methods described ensure safety and accuracy in skin design and glandular resection. They minimize the potential for poor scar location and quality and optimize breast shape and areolar aesthetics. Increased experience with limited scar techniques may supplant inverted T scar methods for some types of reductions, but the latter are likely to remain popular because of their predictability and versatility.

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