

Reduction Mammoplasty with Superior-Lateral Dermoglandular Pedicle: Another Alternative

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During a period of 7.5 years, reduction mammoplasty using a superior-lateral dermoglandular pedicle was performed in 213 mammary glands in 112 patients. This procedure is a modification of the original technique by Skoog that takes advantage of its benefits but adds two basic premises: (1) to preserve the integrity of the galactophorous ducts for future nursing and (2) to cause less innervation injury. Patients were followed for an average of 28 months (range, 3 months to 7.5 years). The quantity of extirpated tissue ranged from 310 to 1380 g, with a median of 520 g. The nipple-areola complex migrated 5 to 14.5 cm (median, 7.8 cm). The most severe complication was partial necrosis of the nipple-areola complex, which occurred in five cases (four patients). This complication occurred only during the first 2 years of the study, in breast resections larger than 800 g, and with migrations larger than 10 cm. This problem resulted in a modification of the technique, and the complication has not occurred for the past 5 years. There were no important alterations in the sensibility of the nipple-areola complex nor in the integrity of the galactophorous ducts. The long-term satisfaction of the patients was high. The authors present an easily designed and accomplishable technique that is applicable to patients with severe hypertrophy and gigantomastia. The technique has a high security index, and the integrity of the mammary gland is maintained to the maximum. (*Plast. Reconstr. Surg.* 107: 693, 2001.)

There are many surgical procedures for reduction mammoplasty.¹ Each presents particular advantages for indications,² vascular preservation,¹ technique design,³ ease of realization,³ minimum scarring,⁴⁻⁶ maintenance of innervation,¹ long-term results,⁷ and so on. Because of the rich mammary vascularization and the importance of preserving the vascular integrity of the nipple-areola complex, the great majority of breast reduction techniques have based their design on preserving the vascularization of this complex.¹ However, during a reduction mammoplasty, it is also important to preserve

the innervation of the nipple-areola complex and the integrity and continuity of the galactophorous ducts. On the basis of this premise, we developed a technique using a superior-lateral dermoglandular pedicle that is easy to design and accomplish and that respects the integrity of the mammary gland. This design, which was modified from the original technique of Skoog,³ has been used for more than 7 years and accomplishes the previously mentioned objectives. We present our experience with this technique of breast reduction using a superior-lateral dermoglandular pedicle in 112 patients over 7.5 years.

PATIENTS AND METHODS

During a period of 7.5 years, from April of 1992 through October of 1999, 112 patients underwent reduction mammoplasty using the superior-lateral dermoglandular pedicle technique. All patients required a reduction greater than 310 g and a migration of the nipple-areola complex greater than 5 cm. Each patient was given a complete evaluation before the surgical procedure that included the following laboratory tests: complete blood-cell count, coagulation studies, and blood chemistry. Directed physical exploration of the mammary gland searching for tumors was performed or a medical history on tumors was obtained. An internal medicine evaluation and electrocardiogram were obtained when necessary.

Surgical Technique

The entire procedure is designed before the surgery with the patient sitting and with the arms placed to the sides. The following five

points and clue lines are marked: clavicular notch, sternal medial line, submammary sulcus, anterior axillary line, and clavicular medial line. This last one, which corresponds to the central meridian of the mammary gland, will determine the superior migration of the nipple-areola complex. If important lateral or medial displacement of the nipple-areola complex exists before surgery, the clavicle half-point could be placed at a lesser or greater distance from the clavicular notch (this should be determined individually in each case). This is done to balance the upper displacement at the moment that the nipple-areola complex migrates.

After marking these reference points, we determine the new height that the center of the nipple-areola complex will have. For this, a distance of 21 ± 1 cm is taken as a base from the clavicular notch on the central meridian of the patient's mammary gland. This distance will vary according to the height of the patient and will be checked by transferring the location of the submammary crease toward the front of the breast. Around this point, an oval 6 cm wide and 3 cm high is traced; this oval corresponds to the new nipple-areola complex. After locating this point, Wise's pattern is used to create the lateral lines of the mammary resection. The opening of the lines will vary from 90 to 120 degrees, depending on the quantity of tissue to be resected. The length of these lines will vary from 7 to 8 cm, starting from the center of the new nipple-areola complex. This distance will correspond to the length from the nipple to the new submammary sulcus. Starting from the end of these lines, a continuation toward the new submammary crease is made. The new submammary crease is traced 1 to 2 cm above the original one. The anterior axillary and sternal medial lines will serve as references so that the union of the submammary crease with the lateral lines will be more symmetric.

Once the surgical resection pattern is laid out, we delineate the vascular pedicle of the nipple-areola complex. This pedicle will have a lateral base with a width of 6 to 8 cm, depending on the new breast volume that is desired. The pedicle will encircle the nipple-areola complex in the usual manner at approximately 1 cm around the complex. The commencement of the superior border of this pedicle will vary according to the migration and rotation that should be done with the nipple-areola

complex. The greater the migration required by the nipple-areola complex, the larger the rotation that should be performed; the larger the rotation performed, the greater the vascular commitment that can be present. It is for this reason that in small migrations (from 6 to 8 cm), the pedicle may begin 2 to 3 cm out from the center of the new nipple-areola complex. However, in the presence of migrations greater than 8 cm, the pedicle should be located in a lower position to avoid a very marked rotation, with pedicle torsion and vascular commitment. In these cases, the beginning of the pedicle could be located more than 3 or 4 cm from the center of the new nipple-areola complex and exceed, without any problem, the lateral line of the new mammary gland (Fig. 1, *above, left*).

The surgical procedure is generally performed under peridural block and infiltration of the surgical area with adrenaline in a 1:300,000 dilution. We then de-epithelialize the vascular pedicle, maintaining the new size of the nipple-areola complex, and the deep dermis (Fig. 1, *above, center*). It is of vital importance that the tissue resection and the incisions made to the vascular pedicle be totally perpendicular to the thoracic wall. In this way, the pedicle will be dermoglandular and the integrity of the nipple-areola complex toward the mammary gland and the thoracic wall will be maintained (Fig. 1, *above, right*). The demarcated area outside the vascular pedicle and within the design is excised (Fig. 1, *below, left*). The size of the new breast will depend on the length and width of the remaining dermoglandular pedicle.

Once the mammary tissue resection is done, the complex is rotated toward its new position and the pedicle can be fixed to the thoracic wall with nonabsorbable sutures for greater support (Fig. 1, *below, center*). To achieve a better cone shape for the breast, plication of the inferior part of the pedicle over the area sutured to the thoracic wall may be performed with nonabsorbable sutures. Closure is performed as usual, and a negative-pressure drain is used for 24 to 48 hours. The patient checks out from the hospital 24 hours after surgery (Fig. 1, *below, right*).

RESULTS

During the 7.5-year period from April of 1992 to October of 1999, reduction mammoplasties were performed on 213 mammary

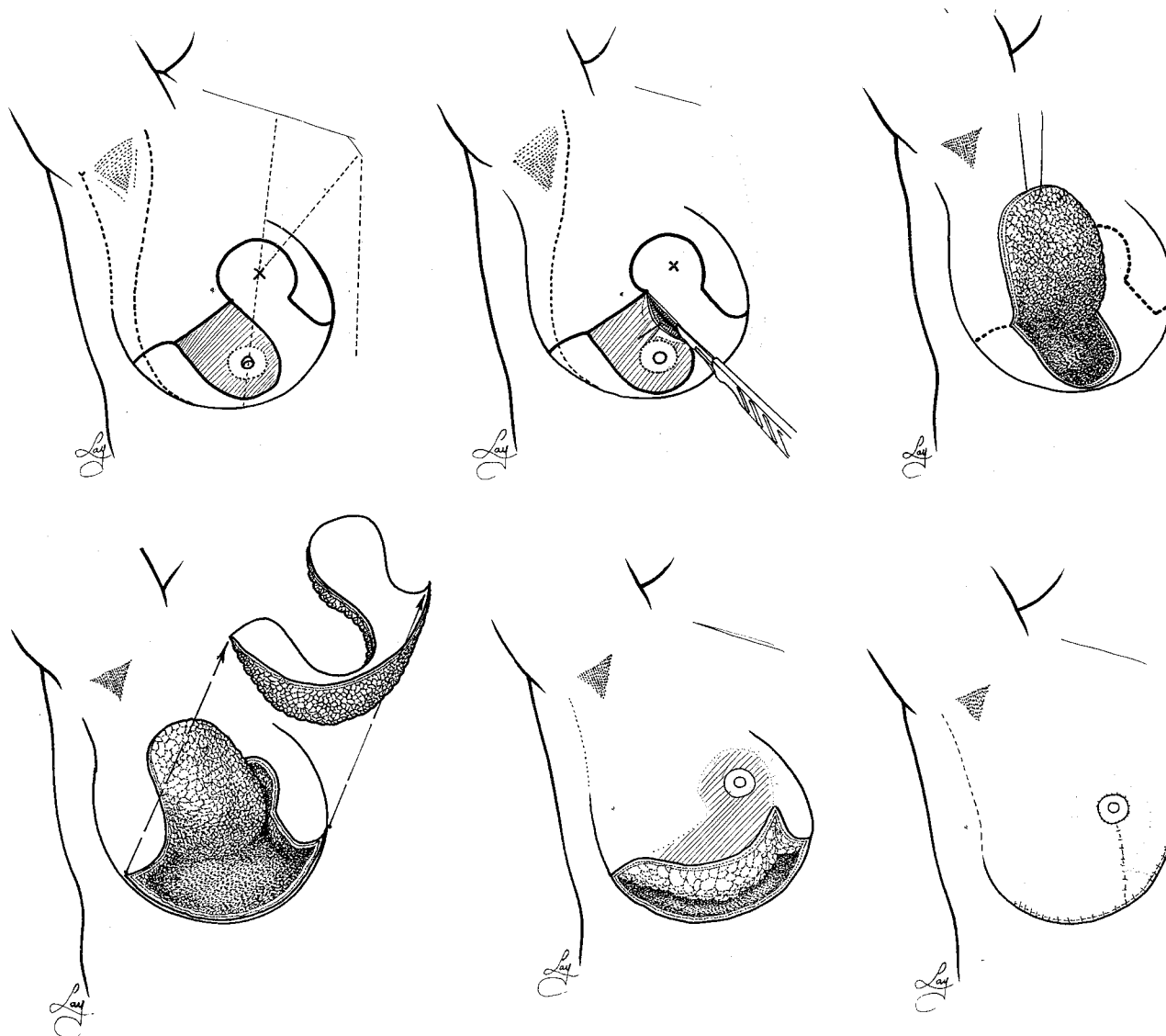


FIG. 1. (Above, left) Design of the technique, with the pedicle beginning 2.5 cm from the center of the new nipple-areola complex. (Above, center) Surgical technique, incision around the pedicle, and area to be de-epithelialized. (Above, right) Dermoglandular pedicle maintains the integrity of the nipple-areola complex toward the mammary gland and the thoracic wall. (Below, left) Tissue is resected perpendicularly outside the demarcated area. (Below, center) Pedicle rotation, plication, and fixation to the thoracic wall. (Below, right) Closure in the usual way.

glands in 112 patients. Patients ranged in age from 19 to 61 years (median age, 36 years). The follow-up period ranged from 3 months to 7.5 years (median, 2 years and 4 months). The amount of tissue excised ranged from 310 to 1380 g (median, 520 g) per operated breast. The nipple-areola complex migrated 5 to 14.5 cm (median, 7.8 cm).

The complications that occurred included five partial necroses of the nipple-areola complex. Two of these necroses were in the same patient. These necroses occurred in resections greater than 800 g per gland and with migrations greater than 10 cm. These five mammary

glands were operated on during the first 2 years of the study, when the pedicle was always located at the start of the new breast lateral-line pattern, at the border of the new nipple-areola complex. Fat necrosis occurred in 16 of the 213 cases (7.5 percent); it improved with conservative treatment in an average time of 10 days. In 18 cases (8.45 percent), partial dehiscence of the surgical wound occurred at the level of the T-union. In 15 of these 18 cases, fixation of the pedicle to the thoracic wall or plication of the pedicle was not performed. No infections occurred.

The sensibility of the nipple-areola complex

at 3 months was similar to that before surgery in 94 percent of cases. Twenty-three percent of the patients ($n = 26$) lactated and breast-fed their babies during the follow-up period; 23 patients had no problems with the drainage of the galactophorous ducts, but 3 patients had to stop nursing because of breast congestion and pain. A total of 91 percent of the patients were satisfied with their appearance and breast size (Figs. 2 through 4).

DISCUSSION

The mammary gland is a structure that has three basic functions: lactational, aesthetic, and sexual. Therefore, when handling this structure, surgeons must preserve all of these functions. To do so, it is of vital importance to know, among other factors, the anatomy and physiology, the vascular irrigation, the innervation, and the glandular elements of the

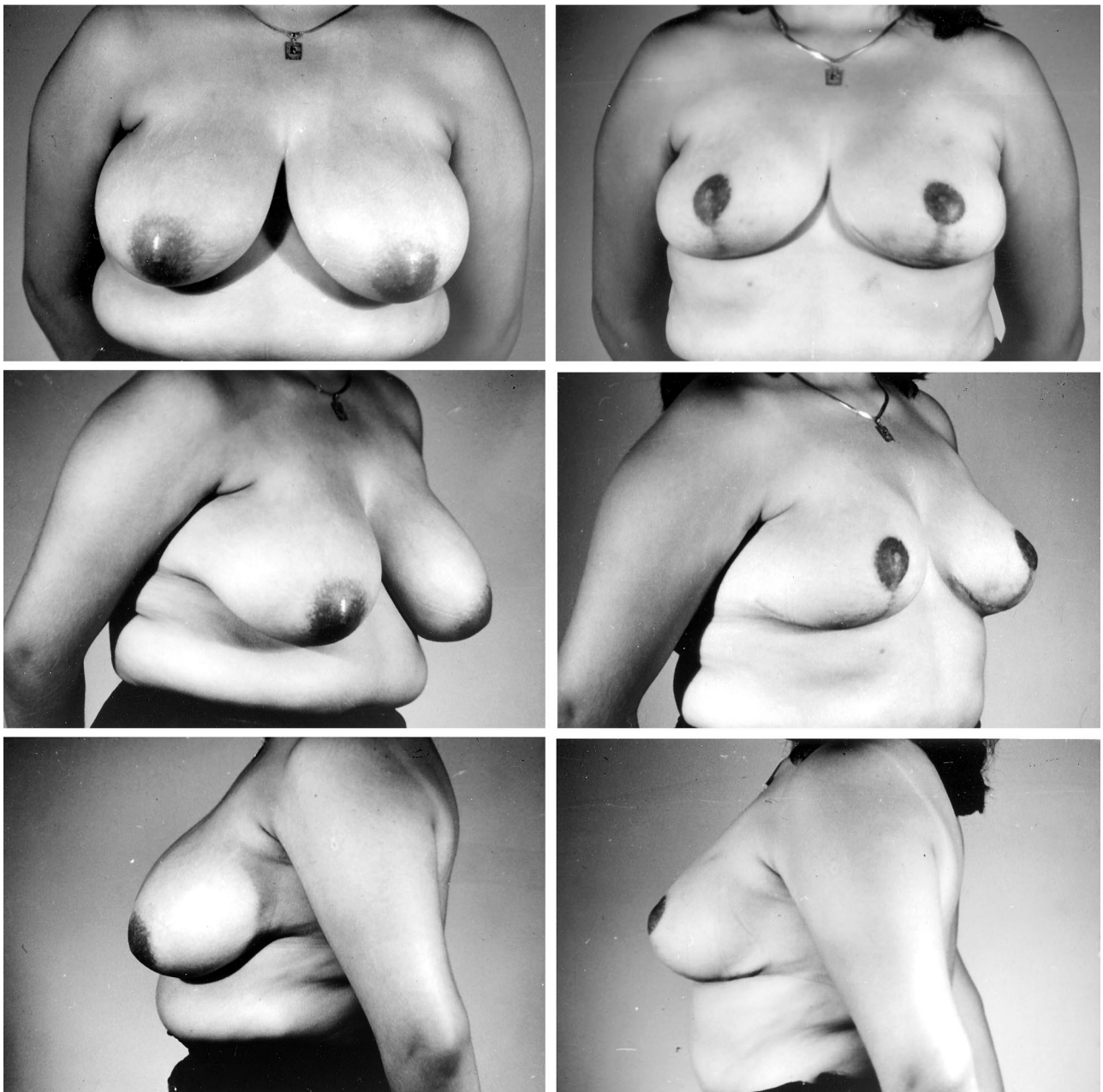


FIG. 2. This 24-year-old woman is shown before (*left*) and 6 months after surgery (*right*). A total of 1650 g of tissue was removed from both breasts (760 g from the right and 890 g from the left). The nipple-areola complex migrated 8.4 cm.

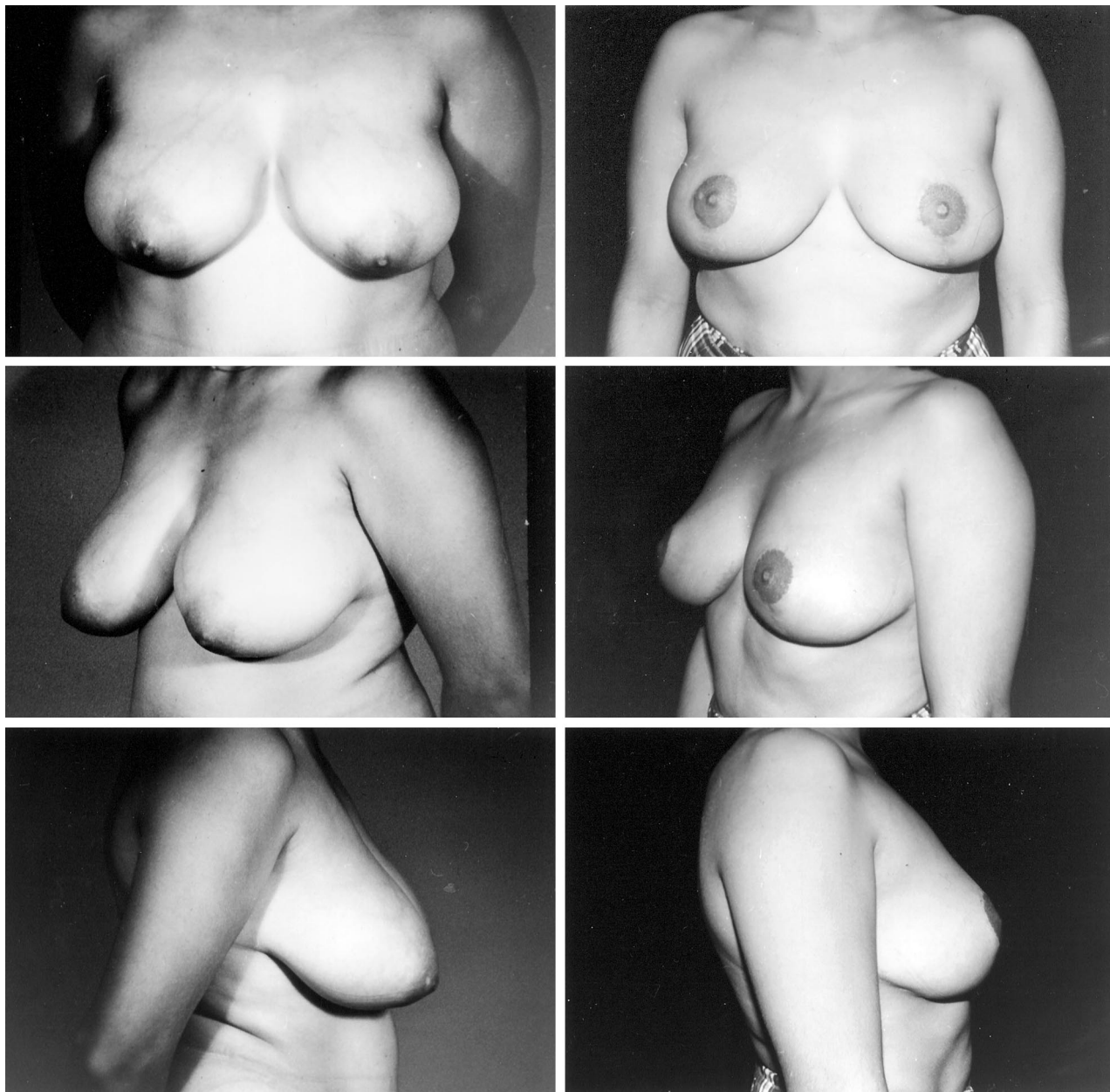


FIG. 3. This 33-year-old woman is shown before (*left*) and 2 years after surgery (*right*). A total of 1240 g of tissue was removed from both breasts (620 g from each). The nipple-areola complex migrated 7.2 cm.

breast.^{1,8} Many techniques have been developed for breast reduction.¹ Each has advantages regarding one or several particular points, especially for the vascular pedicle to maintain the integrity of the nipple-areola complex. This is why different glandular pedicle techniques,^{6,9} cutaneous pedicle techniques,¹⁰ or a combination or mixture of pedicle techniques¹¹ are known. Similarly, the location of the pedicle may be superior,^{10,12,13} inferior,^{11,13-15} lateral,³ or mixed.⁹ Many of the described techniques sacrifice the continuity of the galactophorous ducts^{3,10}; others maintain

the innervation of the nipple-areola complex exclusively with subcutaneous nervous bundles and sacrifice the profound nerves.¹² However, during a reduction mammoplasty, it is important to preserve the innervation of the nipple-areola complex in addition to achieving an adequate form, preserving the vascularization of the complex, and maintaining the integrity and continuity of the galactophorous ducts. The only way to preserve the integrity of the galactophorous ducts and to protect the profound innervation is to maintain the normal continuity of the nipple-areola complex toward

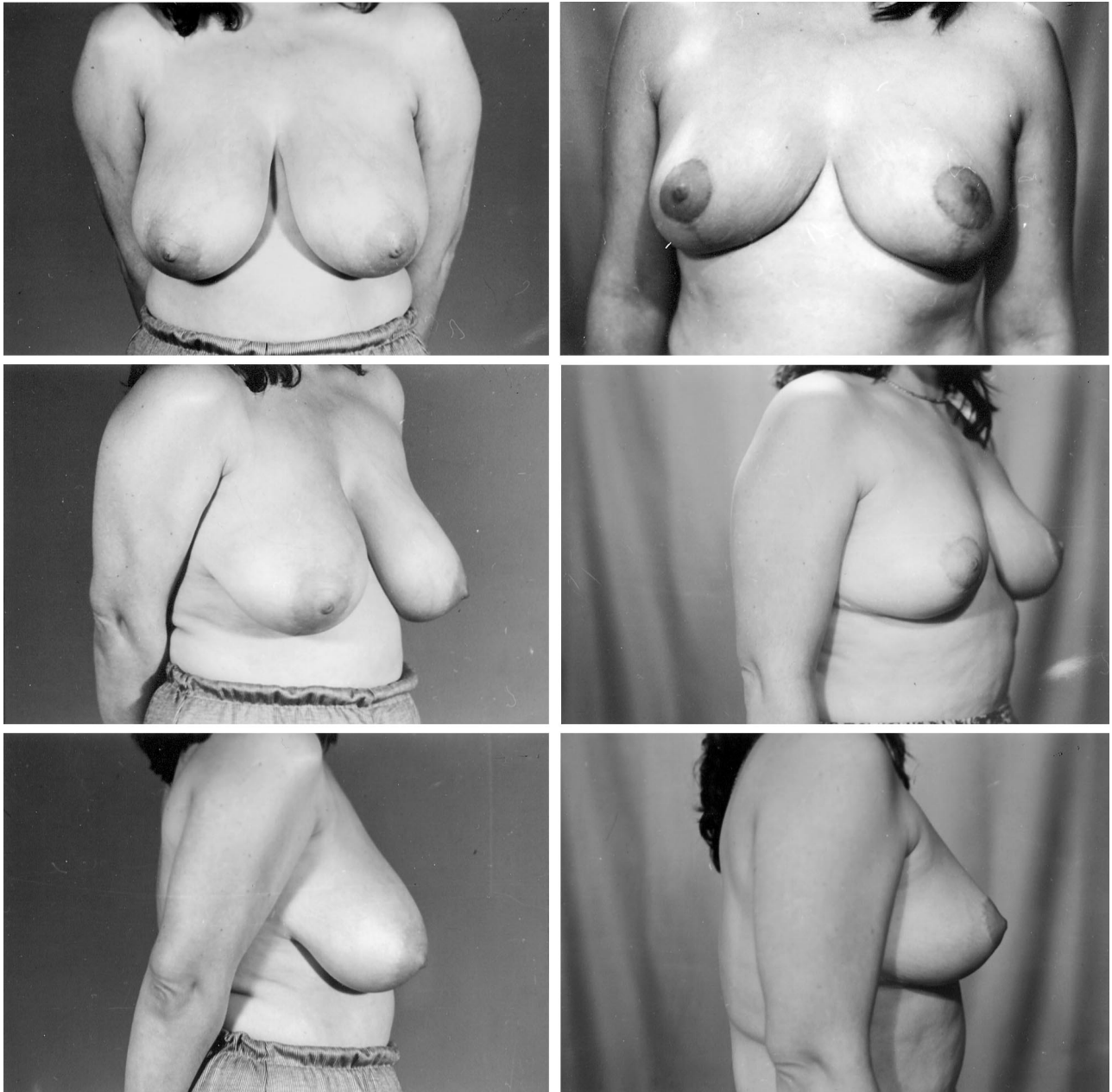


FIG. 4. This 22-year-old woman is shown before (*left*) and 4 years after surgery (*right*). A total of 1170 g of tissue was removed from both breasts (550 g from the right and 620 g from the left). The nipple-areola complex migrated 6.4 cm.

the mammary gland. Only glandular pedicle techniques can do so.

After examining Skoog's technique,³ which uses a superior-lateral cutaneous pedicle, we developed a similar technique but with a glandular pedicle. Skoog's technique³ entails an important vascular contribution based on a superficial vascular system around the nipple-areola complex. However, the continuity with the mammary gland is lost, which injures the galactophorous ducts and the innervation of the nipple-areola complex. Skoog³ reports

moderate sensitive alterations and total lost of nursing capacity with his technique; he rejects the use of a glandular pedicle because he thinks that such a pedicle would favor long-term ptosis and, if any necrosis occurs, the result will be unacceptable. Our results with a follow-up of more than 7 years have not demonstrated that these problems are a limitation for this technique. Our technique, just like that of Skoog,³ is very useful for treating patients with excessive hypertrophy or gigantomastia, because it is possible to move the nipple-areola

complex over large distances and to resect large quantities of tissue without a problem. This technique should be used in breasts in which one must displace the nipple-areola complex by 5 cm or more; for minor displacements, we prefer to use a superior glandular pedicle technique. The pattern is simple and easy, with reference points predetermined in a simple manner. Likewise, this technique is not difficult to perform.

It is of vital importance to emphasize three basic points in the design and realization of the surgical procedure. (1) The patients who had necrosis of the nipple-areola complex were treated during the first 2 years of the study. At that time, the pedicle was always located at the beginning of the lateral line of the new mammary gland. Thus, in very large breasts, the pedicle rotation was greatly forced (almost forming 60-degree angles), which resulted in vascular suffering and partial necrosis of the nipple-areola complex. Once this problem was identified, the pedicle was located lower over the lateral line of the design when the migration of the complex was greater; this complication has not occurred in any other patient since the change of design. (2) The size of the new breast relies on the thickness and the length of the glandular pedicle. The pedicle length is a barely modifiable variable, because it will depend, in a great measure, on the previous breast size and on the pedicle migration that will be necessary. However, it is possible to adapt the pedicle thickness to the desired new breast size. This must be done with care by making the cuts perpendicular to the thoracic wall so that the wall will not become too thin. A thin thoracic wall would put the integrity of the nipple-areola complex at risk. (3) Since we began plicating the glandular pedicle to the thoracic wall and/or over itself, the incidence of dehiscence in the inferior suture line has practically disappeared. This is because less tension is exerted on the wound when the glandular pedicle supports the thoracic wall and the skin is not used as a cutaneous brassiere.

Each breast reduction technique has important advantages. The results obtained with each can be excellent, especially in the hands of their creators.²⁻¹⁵ However, when selecting a

surgical technique, it is important to choose one that is simple to design and to perform, is safe, has good long-term results and, above all, maintains the best possible integrity of the breast. We think that this technique thoroughly satisfies these requirements, and we think it is an excellent option for treating mammary hypertrophy or severe macromastia.

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