Techniques in Cosmetic Surgery

Creation and Evolution of 30 Years of the Inferior Pedicle in Reduction Mammaplasties

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The article describes the experience of the senior author over the past 30 years using the glandular dermo-lipo flap. The flap primarily provides an effective enhancement of the shape of the breast that varies according to the age of the patient, skin elasticity, and mammary gland firmness. More than 2000 patients have had this procedure, including those with asymmetric breasts who had the procedure done on only one breast. (Plast. Reconstr. Surg. 110: 960, 2002.)

The dermo-lipo glandular flap was first described in Brazil at the congress of the Brazilian Society of Plastic Surgery in 1971 and at the congress of the International Society of Plastic and Reconstructive Surgery held in Rio de Janeiro in 1972. The flap has been mistakenly referred to as a pedicle in the Spanish plastic surgery literature. It is shaped at the central part of the lower pole of the breast, precisely in the portion to be resected in reduction techniques with the inverted-T, to provide breast firmness after a large removal of mammary tissue.

In the senior author’s first years of experience, this flap proved to be effective not only in keeping good breast shape but also in supplying vascularization of the lower portion. The author was then encouraged to develop a new approach, described in Plastic and Reconstructive Surgery in 1975, which should be considered the first technique to use a vascular flap because it held the areola complex at its edge. The results of the technique were similar to those Passot achieved with his technique of areolar and horizontal scars; however, the flattening of the breasts and large horizontal scars were unacceptable. Jurado, Courtiss and Goldwyn, Goldwyn, and Reich, among others, also developed procedures described as “inferior pedicle techniques” that are unrelated to our procedure. Our flap works as a natural prosthesis and maintains the conical shape of breasts for a long time, lessening the chances of “basculae” movement.

Over the past 30 years, the technique was adapted to allow the development of five different kinds of flaps for different indications. Currently, the flap technique is performed in most cases of reduction mammaplasty and reconstructive surgery and in the treatment of tuberous breasts, in which it is combined with Peixoto’s technique and the periareolar and vertical approaches.

The indications for the flap procedure are (1) techniques that result in an inverted-T, (2) techniques that result in a vertical and an areolar scar (lozenge technique), and (3) periareolar techniques, in cases of tuberous breasts, which result in an areolar scar only (circumferential technique). This article describes the anatomy of the inferiorly based flap and the applications and complications of the technique—a worthy option in plastic surgery of the breast.

ANATOMY OF THE INFERIORLY BASED FLAP

The inferiorly based flap originates from a dermo-lipo glandular flap and is located on the lower pole of the breast. The flap receives a
Fig. 1. Inferior flap technique. (a) With the patient in a semisitting position, the new areolae are marked with diameters of 4 cm. (b, c) Point A, which corresponds to the inframammary fold at the upper pole of the breast, is marked, and points B and C are marked with a bidigital maneuver. (d) Final view of the markings, as in Pitanguy’s technique. (e, f) The inferior flap is drawn 4 to 5 cm from the middle point of the inframammary fold, with a length 2 cm below the areolae-papillae complex and a thickness of 2 to 3 cm. (g through i) The exceeding breast gland is resected, and the inferior pedicle is attached over the pectoral fascia. (j) The breast is mounted by joining points B and C to the middle point of the inframammary fold. (k) Final view with the sutures completed.
normal and reliable vascular supply from the fourth, fifth, and sixth intercostal perforating vessels of the internal mammary arteries. Venous and lymphatic drainage flows into the internal mammary vein and into the lymph-nodi\textsuperscript{12} in the opposite direction of the arterial stream.\textsuperscript{8,10,13} The decorticated skin helps sustain the flap so it can be attached to the pectoralis fascia; the fat tissue accounts for the volume of the breasts; and the glandular tissue allows recanalization of the milk ducts with no damage to the properties of the mammary gland.

**Surgical Techniques**

**Inferior Flap Technique**

With the patient in a half-sitting position, the new areolae are drawn 4 cm in diameter with a demarcator. A vertical line is drawn from the hemiclavicular line to the upper edge of the areolae (Fig. 1, \textit{a}), and \textit{point A} is marked cor-
FIG. 3. Lozenge technique. (a through d) After marking point A, the point is re-marked 2 cm higher than the first mark. Points B and C are then drawn by a bidigital maneuver, and point D is marked 3 cm above the midpoint of the inframammary fold. (e, f) Decortication of the lozenge area previously marked. (g) By a transversal incision perpendicular to the pectoral fascia, the breast is divided, resulting in the upper and inferior breast poles. (h) The inferior flap is detached from the skin by a sharp undermining. (i) The lateral and medial prolongations of the inferior flap are dissected carefully to preserve the perforating vessels that support the flap. (j) Anterior view of the inferior pedicle ready to be attached to pectoral fascia. (k) Lateral view of the inferior flap attached to the pectoral fascia after all breast gland resection is complete. Suture begins at point D with a maximum length of 7 cm. (l) Separated stitches from point D, 4 cm long, will form the future vertical scar. (m) The areola is sutured by compensatory separated stitches, and any eventual dog-ear is corrected. (n, o) The vertical incision is ready to be sutured. Using the Gillies hook, the breast is pulled up to be immobilized with Micropore tape. (p) Final areola sutures are made in U-shaped, separated stitches, and the vertical suture is made with separated stitches.
responding to the projection of the inframammary fold on the upper pole of the breast. By means of a pinching maneuver and the surgeon’s judgment, points B and C are determined (Fig. 1, b and c). The points are linked to the inframammary fold with curving lines, as in Pitanguy’s technique3 (Fig. 1, d).

With the breast lifted so that the lower pole can be seen, the drawing of the flap is started at the central portion and is extended to 1 to 2 cm below the inferior edge of the areola. The outlined flap is decorticated, and an incision is made on its edges downward to the muscular level to allow the shaping of a dermo-lipo glandular flap, supplied by the fourth, fifth, and sixth intercostal perforating vessels. It is important that the flap be 2 to 3 cm thick (Fig. 1, e, f, and g).

When the resection of the remaining tissue of the breast is completed, the flap is attached to the pectoralis fascia with nylon 3-0 separate stitches. The distal edge of the flap is bent over

Fig. 4. Lozenge technique case. (Left) Preoperative views of a young patient with mild breast hypertrophy and ptosis. (Center, first three rows) Fifteen-day postoperative views. (Right) One-year postoperative views. (Center, below) One-year postoperative view demonstrating the position of the vertical scar.
itself to give the upper pole tissue more projection and to bring the remaining mammary tissue close to the retroglandular area (Fig. 1, h and i). This procedure ensures the recanalization of the glandular tissue and will allow normal breast-feeding.

Points B and C are joined at the middle point of the flap base, and the breast is finished (Fig. 1, j). Suturing is done with separate nylon 4-0 stitches. Skin suturing is continuous using nylon 5-0. The areola is placed at the new position and is sutured with nylon 5-0 “U” stitches (Gillies/Perseu techniques)10 (Fig. 1, k, and Fig. 2).

Evolution of scars. After Peixoto’s technique was published, in 1989 we followed the principles of dermal and epidermal retraction in an attempt to reduce scarring.11 Unlike Peixoto our results were flattened and flabby breasts, so we used the inferiorly based flap as a corrective procedure. The best results were obtained in cases of mild-to-moderate hypertrophy and ptosis. The vertical scars were no longer than 5 cm, and the breasts had a desirable conical shape. The drawing was made according to Arie’s procedure, in which the inferior vertex of the ellipsis ends at the inframammary fold.17 Starting at the fold, a flap 3 cm wide and 6 cm long was outlined. The surgical sequence was similar to that described above.10

Lozenge Technique

Based on Peixoto’s concepts11 and the techniques by Lotsch, Joseph, and Arie, we devel-
oped a procedure that resulted in periareolar and vertical scars. The shape of a lozenge, which gave the name to the technique, was slightly changed: the upper edge gained a round shape to allow removal of more periareolar skin. The technique is advised only for young patients with stretchable skin and moderate hypertrophy, even though we have made resections of up to 900 g on each side.

The new areola is marked, and point A is determined by the projection of the inframammary fold on the upper pole of the breast (Fig. 3, a). Points B and C are marked by means of a pinching maneuver and the surgeon’s judgment to determine the amount of skin to be resected (Fig. 3, b and c). Point D is marked 3 cm above the inframammary fold and 10 to 11 cm from the middle line. A curved line is

Fig. 6. Circumferential technique case. (Left) Preoperative views of a patient with medium-sized breasts and ptosis who required a mastopexy. (Right and center, below) Postoperative result 1 year after circumferential technique reduction and mastopexy.
drawn to join points A, B, and C, and points B and C are linked to point D by straight lines (Fig. 3, d).

After decortication of the outlined area, a transversal incision is made below the areola downward to the muscular section, dividing the breast into equal halves (Fig. 3, e, f, and g). The shaping of the flap starts by undermining the lower pole of the breast and resetting both its lateral and medial edges, with care taken...
not to jeopardize the perforating vessels that will provide the blood supply to the inferiorly based flap (Fig. 3, h). The tissue behind the nipple-areola complex is resected, leaving enough to maintain the safety of the vascular complex (Fig. 3, i and j). The new upper pole is made from the flap attached to the pectoralis fascia (Fig. 3, k) and is sutured with separate stitches up to 4 to 6 cm from point D (Fig. 3, l).

As the Gillies hook is positioned to help push the breast upward, a dog-ear might be noted at the inferior portion, in which case excision is required (Fig. 3, m and n). The areola is sutured with separate stitches (Gillies/Perseu) (Fig. 3, p). Drainage by suction is the standard procedure for 24 hours, and the skin is sutured with separate stitches. With the hook pulling the breasts upward, immobilization is accomplished with Micropore tape (3M, São Paulo, Brazil) for about 15 days to retain the shape of the flap during the necessary retraction of the skin (Fig. 4).

**Circumferential Technique**

The search for smaller scars led to the development of new procedures, such as the circumferential technique, that resulted in a periareolar scar only. Combined with the inferiorly based flap, the technique has given us satisfactory aesthetic results. This procedure is used only for young patients with hypertrophy or tuberous breasts.19
with resections no greater than 500 g per breast.\textsuperscript{20}

Demarcation of points $A$, $B$, and $C$ follows the same steps as in the lozenge technique outline. However, point $D$ is now marked 6 to 8 cm above the inframammary fold, depending on the size of the breast (Fig. 5, $a$). The operative steps are also very similar to the lozenge technique, even though the final suture is made around the areola by means of subdermal stitches (Benelli’s “round block”\textsuperscript{21}) (Fig. 5, $b$ through $j$, and Fig. 6).

**Technique for Tuberous Breasts**

Tuberous breasts are rarely found, and their main characteristics\textsuperscript{19} are (1) hypertrophy of the nipple-areola complex, (2) pseudohermiliation, (3) hypoplasia with breast asymmetry, and (4) constriction of the lower pole and reduction of supero-inferior diameter.

The hypertrophied areola is treated by means of a circumareolar resection and according to the circumferential procedure,\textsuperscript{20} with the shaping of an inferiorly based flap bent over itself\textsuperscript{19} (Fig. 5, $a$ through $j$). For cases of severe hypomastia and asymmetry, the circumferential technique can be combined with breast augmentation procedures to achieve the best aesthetic results (Figs. 7 and 8).

**Complications**

It is always important to consider complications, even though only 0.5 percent of our approximately 4000 breast procedures resulted in total or partial necrosis caused by inadequate handling of the flap, damage of the perforating vessels, or vascular complications observed more than 3 weeks postoperatively.

The inverted-$T$ procedure with flaps (inferior or flap technique) ($n = 3000$) resulted in two cases of total necrosis of the areola and 11 cases of partial necrosis of the areola. Hypertrophic scars/keloids occurred in 251 cases.

In the vertical scar (lozenge technique) with flaps ($n = 800$), no cases of total or partial necrosis of the areola were reported. Hypertrophic scars/keloids occurred in 82 cases, and there were 68 cases of asymmetry.

In the periareolar scar (circumferential technique) ($n = 200$, tuberous breasts included), no cases of total or partial necrosis of the areola were reported. Enlargement of scars\textsuperscript{17} was seen in 100 cases, and flattening of the breasts occurred in 50 cases.

We cannot provide exact data for all of the results because some of the procedures were performed during other operations or in surgical demonstrations.

**CONCLUSIONS**

Over the past 30 years, the flap has been widely used because it provides a conical shape to the breasts and gives good long-term results. Once the flap is sutured to the muscle wall, the weight of the remaining breast is reduced and the basculae movement is decreased. The procedure has proved to be very effective when combined with other techniques (such as the inverted-$T$, vertical, and periareolar), depending on the desired final results.

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**REFERENCES**

13. Georgiade, N. G., Georgiade, G. S., and Riefkohi, R.


