Reduction Mammaplasty in a Single Central Block

8

João Erfon, Claudio Mauricio M. Rodrigues, and Guilherme Teles

8.1 Introduction

In the 1980s, reduction mammoplasty procedures underwent a number of changes to reduce scarring, although these changes also resulted in a loss of form (Peixoto 1980, 1984). However, the concepts had a significant influence on the development of breast reduction surgery. New techniques have been investigated with the objective of achieving good breast shape with less scarring (Arié 1957; Bozola et al. 1987; Sepúlveda 1981). These techniques aim to reduce scarring and tension in the sutures by appropriately adjusting the new parenchyma with the skin that surrounds it (Erfon et al. 1989, 1992, 1996). However, the size of the scar is only reduced within the limits of possible skin contraction, which varies among patients.

Depending on the breast volume to be resected and the degree of ptosis of the breasts, incisions can be planned so that the scars end in an inverted T or vertical manner. The same principles of parenchyma resection use a single central block with the superior vascular pedicle and the nipple-areola complex (NAC) on the top. In this technique, the breasts are not modeled using tension on the skin but by proper fitting to the breast cone, which promotes more satisfactory results.

8.2 Method

We conducted a retrospective study of female patients who underwent breast reduction using the single central block technique from July 1985 to December 2015. Patients were classified into four groups according the size of the breast (Bozola et al. 1987; Franco and Rebello 1977), with the procedure adapted for each group. Three basic principles were followed: (1) modeling the breast parenchyma in a single central block, separated from the skin, without disconnecting the NAC; (2) creating a pedicle of the upper base, as described by Weiner et al. (1973) and modified by this author (Erfon et al. 1989, 1992); (3) reducing scarring using retraction of the skin and marking incisions that match the size and mounting of the parenchyma separated from the skin (Chiari 1992; Erfon et al. 1992, 1996).

Work performed at ArtClinic.

J. Erfon, M.D. (✉)
Department of Surgery, Walter Cantídio Hospital of the Federal University of Ceará, Rua Atilano de Moura, Fortaleza, CE 60810-180, Brazil
e-mail: erfon@artclinic.com.br

C.M.M. Rodrigues, M.D.
Unichristus University, Rua Atilano de Moura, Fortaleza, CE 60810-180, Brazil

G. Teles, M.D.
Defeitos da Face Hospital and Santa Cruz Hospital, Rua Atilano de Moura, Fortaleza, CE 60810-180, Brazil

J.M. Avelar (ed.), *Breast Surgery*, https://doi.org/10.1007/978-3-319-54115-0_8

8.3 Technique

The marking of the patient starts in an orthostatic position. A dotted line from the sternal notch to the xiphoid is marked and serves to verify the symmetry between the two breasts (Fig. 8.1a). The submammary sulcus is then defined. Point A, which is the uppermost point of the new NAC, is marked at 2 cm above the projection of the inframammary sulcus (Fig. 8.1a, b).

After the patient is anesthetized under sedation, in addition to local anesthesia or general anesthesia, her back is elevated to 45°. Starting at point A, two lines ranging from 5 to 9 cm in length are drawn toward each side of the NAC, thus defining the points B and C by forming a triangle (Fig. 8.1a, b). This marking defines the upper pedicle and vascular flap. The base of the pedicle can be expanded using a semi-circular line outside the "triangle," unifying points A, B,

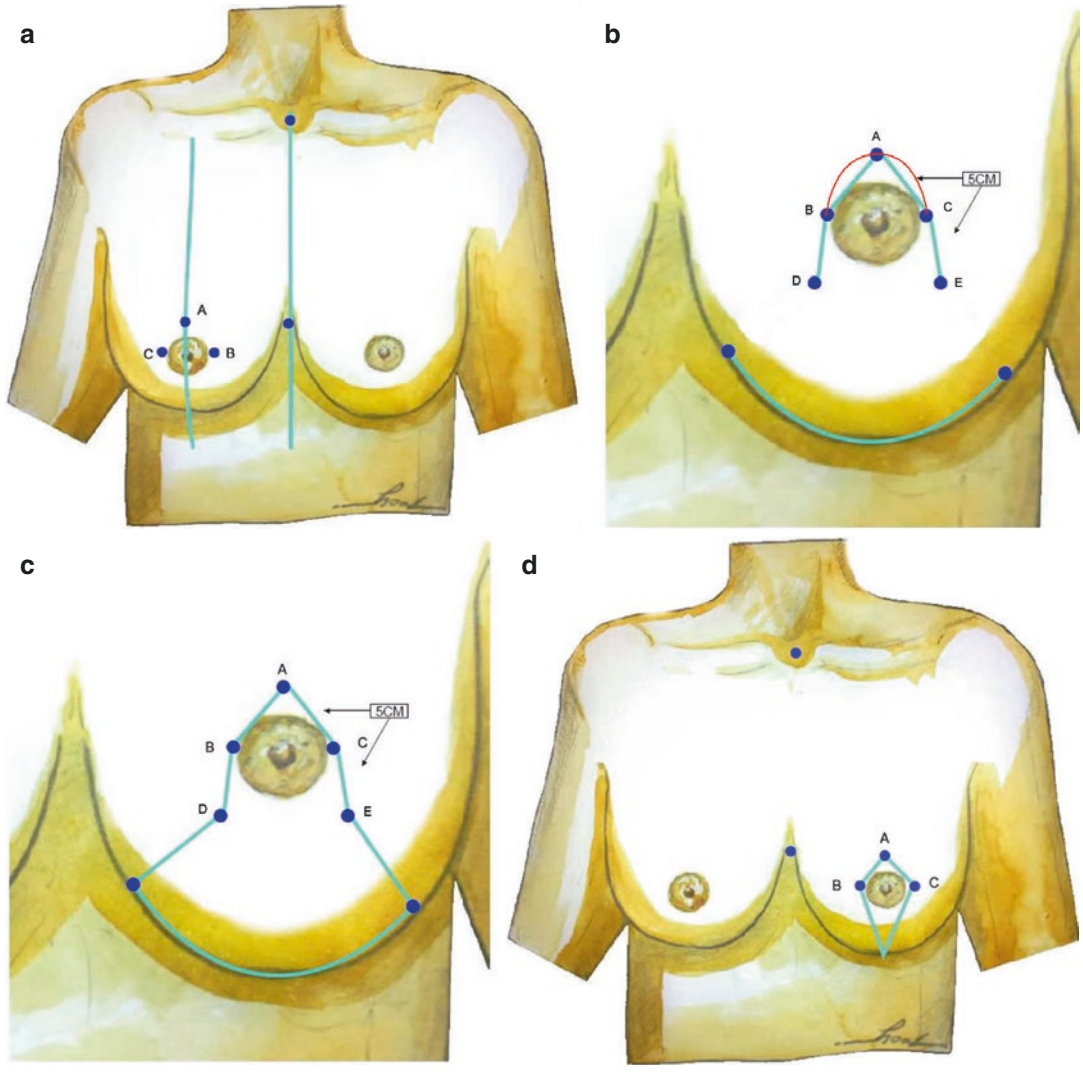

Fig. 8.1 Planning and marking the incisions. (**a**) Marking of the breasts while standing, starting with the previous midline of the body and points A, B, and C. (**b**) Marking the other incisions (see text). (**c**) Completed marking of the inverted T. (**d**) V marking for periareolar and vertical scars

and C (Fig. 8.1b). When the NAC is very lateralized the distance between A and C can be increased relative to the distance from A to B, allowing greater medial rotation of the same (Fig. 8.1c).

Two straight lines, each 5 cm in length, are marked starting from points B and C down, with a small inclination between them depending on the amount of skin to be resected (Fig. 8.1b). Two lines starting from the distal ends of these segments are joined to the submammary fold so that their dimensions, together, are approximately equal to the marking line in the same groove (Fig. 8.1b). The symmetry of the marking in the contralateral breast is created using the anterior midline of the body, keeping an equal distance between it and the medial incision of the drawing on each breast. This is the inverted T marking (Fig. 8.1c) .When the distal ends of the two straight 5-cm segments are very close to one another, the marking to the submammary sulcus can be concluded in a V (Fig. 8.1d).

In patients under general anesthesia, the retromammary space is infiltrated with a saline solution (adrenaline saline 1:500 mL). In patients who received a local anesthetic and sedation, the anesthesia solution used is one ampoule (1 mL) adrenaline (1:1000) in 160 mL saline in addition to 40 mL of 2% xylocaine.

The surgery begins with de-epithelialization of the area around the NAC, extending 2 cm below it. Then, a total skin excision is carried out in the previously marked area in the lower pole of the breast (Fig. 8.2c).The medial and lateral skin flaps (2 cm thick) are dissected. The dissection continues to 1 or 2 cm above points B and C, going to the muscle fascia (Fig. 8.2d). Dissection of the retromammary space is performed by completely freeing the breast from the thorax plate, resulting in a single central block that comprises the breast parenchyma and the NAC, maintained by the upper pedicle (Fig. 8.2c) (Davison et al. 2007).

The breast volume is reduced in the external and medial quadrants (in minor amounts) by keeping the entire distal and posterior extent of the single central block (Fig. 8.2c, d). This block needs sufficient tissue to create the new breast (Fig. 8.2a, b, e-h). Then, the single central block is attached to the thorax in the new planned position using two stitches with 3-0 colorless mononylon: one stitch at the distal end of the flap fixed to the center of the submammary fold and another on the back part of the block, securing it to the muscle fascia at the posterior projection of the NAC in the new position (Fig. 8.2c, d).The dermal suture is started with three stitches using 3-0 colorless mononylon, uniting the skin flaps using 5-cm straight lines, which form the vertical scar. The first stitch joins the distal ends of these two segments to the submammary sulcus, the second stitch joins points B and C, and the third stitch joins the middle part (Fig. 8.3g). The symmetry can be checked at this point of the surgical procedure because the NACs are fully positioned (Fig. 8.3g, h) (Lassus 1987).

The suture is concluded using subdermal stitches with 4-0 colorless mononylon in the skin flaps and 5-0 colorless nylon in the NAC. Monocryl can also be used. External sutures are rarely used. Bandaging is carried out with dry gauze and a special brassiere that is used for 2 months.

In cases of mastopexy, the same technique can be used to remove only the skin and retain all lipoglandular tissue for the formation of a new breast. In such cases, the tissue of the side quadrants is used and sutured to the central block of the breast to increase its volume (Fig. 8.3c-f).

8.4 Results

From July 1985 to December 2015, a total of 2005 mammoplasties were performed using this technique: 1531 reduction mammoplasties and 474 mastopexies. The average patient age was 46 years (range: 17–75 years). The average resected volume was 350 g per side, ranging from 0 g in mastopexies to 1550 g in breast reduction.

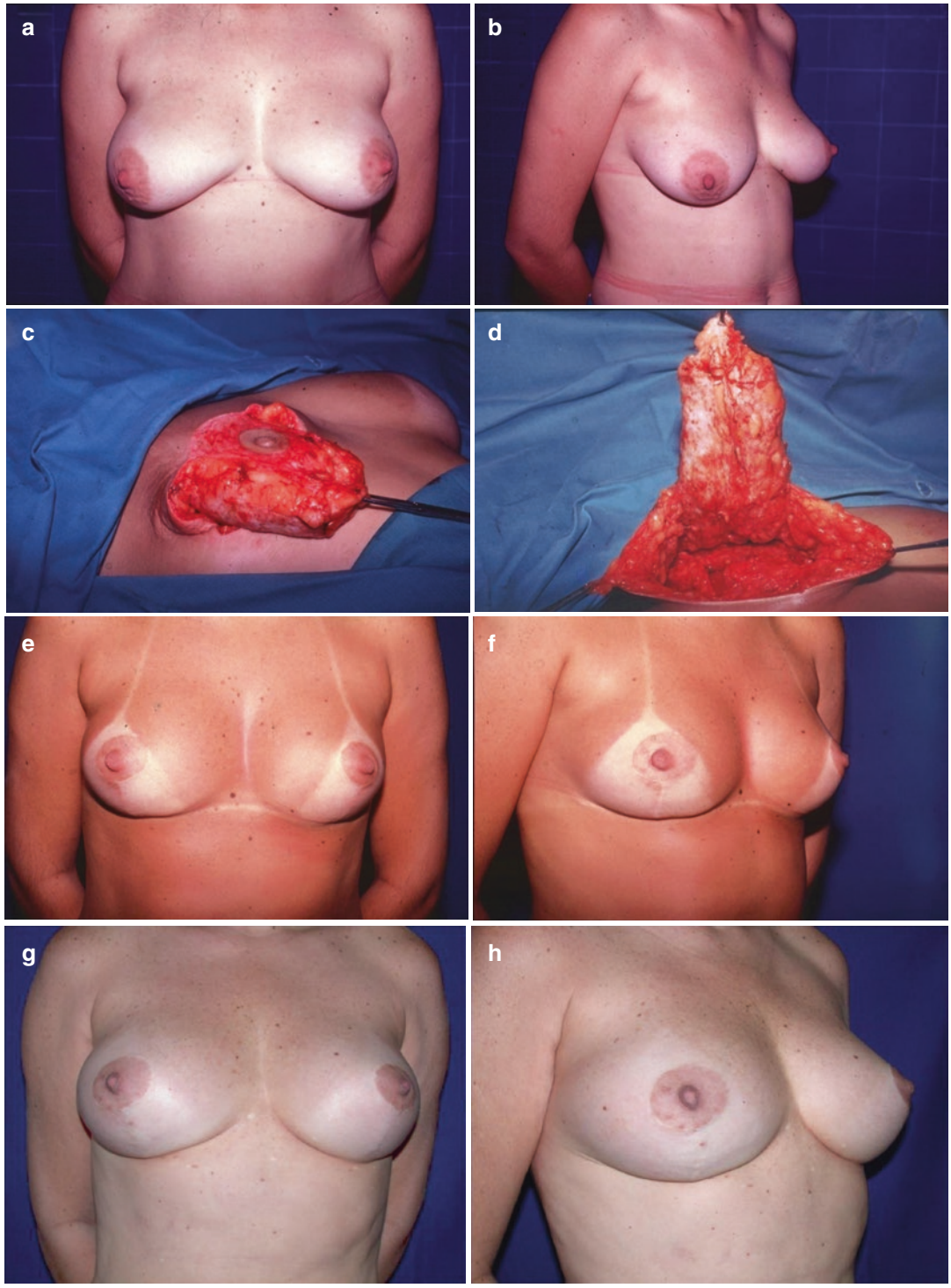

Fig. 8.2 Before, during, and after mammoplasty using a single block technique. (**a** and **b**) Preoperative breast hypertrophy. (**c** and **d**) Intraoperative showing a single central block of mammary parenchyma, with the NAC at the top. (**e** and **f**) Six months postoperative. (**g** and **h**) 19 years postoperative

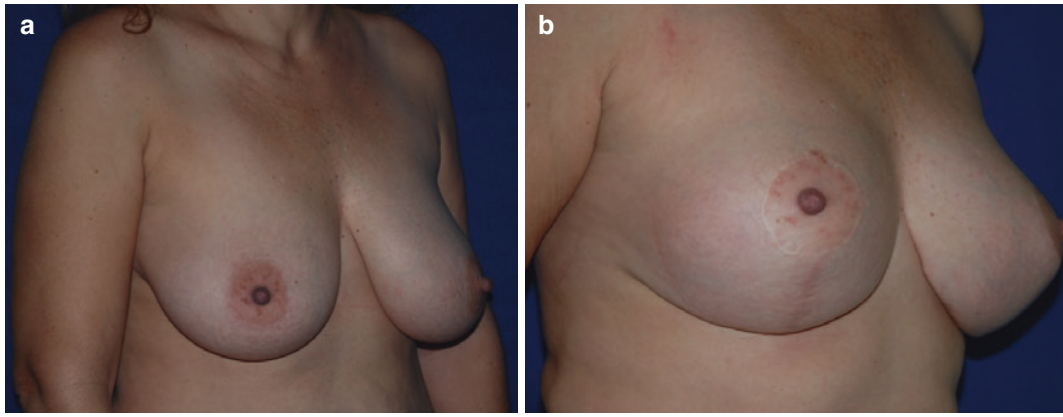

Fig. 8.3 Preoperative and late postoperative hypertrophy and ptosis mammary. (**a**) Preoperative hypertrophy and ptosis mammary. (**b**). Postoperative reduction mammoplasty, 6-month follow-up

The observed results are superior to those obtained previously using other techniques by the same author (McKissock 1972; Pitanguy 1967, 1976; Strombeck 1960). The benefits of this technique include the following: easy shaping of the breast into a conical form, good maintenance of the NAC and skin flap vascularization, preservation of breast sensitivity and the possibility of breastfeeding, good-quality scars, reduced stress on the skin flaps, and a natural and easy rise of the NAC, which is held in its new position by a breast tissue block posteriorly and inferiorly to it. An additional advantage is the possibility of greater resection of glandular tissue in the upper lateral quadrant, allowing for better shaping of the breast cone (Figs.8.2c, d).

8.5 Discussion

Providing patients with the desired physical and psychological change, with a seamless integration between body and mind, has been a constant concern of the senior author. Breast lift surgery is a body contouring technique that is able to provide aesthetic improvement, in addition to psychological and physical improvement related to ptosis and breast hypertrophy. Common complaints of back pain, bra indentations on the shoulders, and dermatitis in the submammary folds are resolved or mitigated after this procedure, thus improving the quality of life of these patients (Kececi et al. 2015; Spector and Karp 2007).

Mammoplasty techniques can be classified mainly by use of pedicle vascularization of the NAC and the final position of the scar. Ultimately, the choice of technique depends on the experience of the surgeon, the expectations of the patient, the positioning and extent of the scars, and the degree of hypertrophy and ptosis of the breasts.

Many techniques for breast reduction have been described, indicating the difficulty of this type of surgery (Erfon et al. 1992, 1996; Weiner et al. 1973). A group of authors emphasized the form and shape of the breast parenchyma (Lima 1979; McKissock 1972; Pitanguy 1967, 1976; Souza Pinto et al. 1983; Strombeck 1960), whereas others were concerned about the extent of the scars (Arié 1957; Peixoto 1980, 1984; Sepúlveda 1981). A third group most valued surgical planning and the marking of the skin (Benelli 1988, 1990; Bozola et al. 1987; Wise et al. 1963).

As a basis for techniques of modern mammoplasty, Lexer (1912) described partial resection

of the inferior pole by implementing the NAC and final scar in an inverted T shape. In 1930, Schwarzman described periareolar de-epithelialization and the importance of preserving the dermis for vascularization of the NAC—concepts that are still used today. In 1942, Thorek carried out amputation of the lower pole of the breast and grafting of the NAC in large breasts, where the pedicle elevation of the NAC to its desired end position was considered unlikely. In 1957, Arié described the superior pedicle technique with periareolar de-epithelialization, NAC implementation, and closing in an inverted T shape. The latter has been modified and become better known through the publications of Pitanguy (1967, 1976), who described in detail the marking of the breast with predetermined lines, breast construction, and positioning of the NAC. In 1960, Strombeck introduced the concept of a bipediculated flap in a horizontal form—an idea that was later reinforced by McKissock (1972) who used a bipedicled flap in its vertical form. Skoog (1963) and Silveira-Neto (1976) described, respectively, the upper lateral and upper medial flaps. The inferior pedicle was first described in 1976 by Jurado (1979) and, soon after, by Robbins (1977); it then gained popularity because of its versatility and reliability. All of the above techniques underwent modifications from their original forms to become the currently most widely used techniques—each with its indications, advantages, and disadvantages. Weiner et al. (1973) described his technique with a higher single dermal pedicle to implement the NAC in cases of subcutaneous mastectomy, breast reduction, and breast lift (Weiner et al. 1973).

Breast reduction is one of the most difficult procedures in plastic surgery. It aims to obtain the result of a new breast with a beautiful shape, adequate volume, well-positioned NAC, and preserved vascularization and sensitivity (Orlando and Guthrie 1975). Many techniques have been described, but a movement in the direction of scar reduction began in the 1980s—sometimes at the expense of form and shape, which had always been prioritized by most authors, regardless of the extent of the scars (McKissock 1972; Pitanguy 1967, 1976). In 1985, the senior author of this chapter had a new idea, prioritizing not only the form and the scars, but also—and primarily—preservation of the functions of the breast (Erfon et al. 1989, 1992, 1996).

For Abramo (2012), maintaining the vascularization and the sensitivity of the NAC was primordial using the superior dermal pedicle (Abramo 2012). Agbenorku et al. (2012) concluded that breast reduction eased many of the physical and psychological symptoms in a group of patients with gigantomastia in Ghana (Agbenorku et al. 2012). Chiummariello et al. (2008) investigated the possibility of breastfeeding by comparing four different pedicles for breast reduction; the superior pedicle was more favored for postsurgical breastfeeding. His results showed that infants could be breastfed by 60.7% of patients whose technique used the superior pedicle, 55.1% of the lateral pedicle, 48% of the medial pedicle, and 43.5% of the inferior pedicle (Chiummariello et al. 2008).

Van Deventer et al. (2008) described necrosis of the NAC as a serious complication that can occur in the hands of experienced surgeons (Van Deventer et al. 2008). Other authors reported an incidence ranging from 0.8% to 2.1% for complete necrosis of the NAC and 7.3% for partial necrosis of the NAC (Van Deventer et al. (2008). Karsidag et al. (2011) suggested the use of a free graft of the NAC associated with a dermoglandular pedicle superior base to obtain better results in the shape of the breasts, as well as reduce necrosis of the NAC, in cases of gigantomastia and severe ptosis (Karsidag et al. 2011). Foustanos et al. (2011) advocated for a change in the upper pedicle of Pitanguy's technique to facilitate lifting of the NAC in cases of gigantomastia and dense breast parenchyma. This technique makes two flaps that overlap, a medial pedicle nourished

by internal intercostal vessels on the other side and vascularized by the lateral thoracic vessels (Foustanos et al. 2011).

Mammoplasty using a central single block is easy to plan and perform, even for new surgeons. It allows for a final result that is within the preoperative expectations. The position of the NAC and other incisions may be easily changed during the procedure, if necessary, by the flexibility of the marking. Maintaining a single central block consisting of mammary parenchyma and NAC facilitates the modeling of a new breast and its rise (NAC), which occurs naturally in its new position without the need for traction as in other techniques. It is necessary, however, to leave enough tissue volume inferiorly and posteriorly to the NAC, because the skin flaps are very thin (about 2 cm in thickness) and do not add much to the new breast volume. The NAC is on top of the central single block, without tension, when the appropriate tissue volume is left (Fig. 8.3g, h).The single central block of tissue also helps obtain symmetry between the breasts because it is very easy to identify specific differences in these flaps. When a higher rise is necessary for the NAC, the single central flap should be longer, narrower, and thicker (Fig. 8.2c, d).

8.6 Complications

Mammoplasty has reported complication rates ranging from 5% to 30% (Fischer et al. 2014). Complications can be classified as early or late, as well as major or minor, depending on the need to revise surgical or invasive procedures. Typical early complications include bruising, partial necrosis of the skin or fat, slough of the NAC, wound dehiscence, and infection. The most common late complications are hypertrophic scarring, asymmetry, hypertrophy recurrence, abnormal sensitivity of the NAC, and breastfeeding failure. Clinical factors such as age, obesity, diabetes, hypertension, and smoking and surgical factors such as resected breast volume and duration of surgery are associated with higher rates of complications.

Using the technique described in this chapter, steatonecrosis was observed at the most distal end of the flap in 45 (2.24%) patients. There were no cases of NAC necrosis. Bruising occurred in 5 patients (0.24%) and seroma in 82 (4.08%) patients. Dehiscence in the inverted T was not very frequent because there is no tension over the skin flaps in this technique (compared with other techniques that shape the breasts with the skin flaps); it occurred in 65 (3.24%) patients. One case of infection led to a 2-cm necrosis of the skin on the edges of the vertical scar; it required reoperation for wound closure and adjustment according to the contralateral breast. The senior author of this paper experienced two cases (0.09%) of partial necrosis of the NAC to a minimum extent, which healed by secondary intention. Reoperations were performed in 95 (4.73%) patients for skin adjustments or further reductions in volume. In most cases, the review was prompted by the vertical incision scar.

Conclusion

Mammoplasty is one of the most difficult procedures in plastic surgery. The aim of this surgery is to achieve a new breast with a beautiful shape, adequate volume, a well-positioned NAC, and preserved vascularization and sensitivity. The technique described in this chapter uses a single central block with an upper vascular pedicle, incorporating the breast parenchyma with the NAC. The advantages of this procedure include ease of modeling the breast into a cone shape; ease of lifting the NAC; good preservation of vascularization in the NAC and skin flaps; preservation of breast sensitivity (which can be identified using simple tests of tactile sensitivity); preservation of breastfeeding function; good-quality scars; reduced stress on the skin flaps; and natural rise of NAC, which is kept in its new position by a breast tis-

sue block that is left inferiorly and posteriorly to it. The surgery is easy to plan and perform, with very satisfactory aesthetic results. Thus, it can be an appealing surgical option for cases of breast reduction and/or mastopexy.

References

Abramo AC (2012) A superior vertical dermal pedicle for the nipple-areola: an alternative for severe breast hypertrophy and ptosis. Aesthetic Plast Surg 36:134–139

Agbenorku P, Agamah G, Agbenorku M, Obeng M (2012) Reduction mammaplasty in a developing country: a guideline for plastic surgeons for patient selection. Aesthetic Plast Surg 36:91–96

Arié G (1957) Una Nueva Técnica de Mastoplastica. Ver Lat Americana Cir Plástica 3:23–28

Benelli L (1988) Technique de plastie mamaire: le "round block". Rev Fr Chir Esthet 50:7

Benelli L (1990) A new periareolar mammaplasty: the "round block" technique. Aesthetic Plast Surg 14(2):93–100

Bozola AR et al (1987) Sistematização de Mamaplastia em "L". Revista Soc Bras Cir Plástica 2(1):13–33

Chiari A Jr (1992) The L short-scar mammaplasty: a new approach. Plast Reconstr Surg 90:233–246

Chiummariello S, Cigna E, Buccheri EM, Dessy LA, Alfano C, Scudery N (2008) Breastfeeding after reduction mammaplasty using different techniques. Aesthetic Plast Surg 32:294–297

Davison SP, Mesbahi AN, Ducic I, Sarcia M, Dayan J, Spear SL (2007) The versatility of the superomedial pedicle with various skin reduction patterns. Plast Reconstr Surg 120(6):1466–1476

van Deventer PV, Page BJ, Graewe FR (2008) The safety of pedicles in breast reduction and mastopexy procedures. Aesthetic Plast Surg 32:307–312

Erfon J, Barbosa V, Brasil AG Jr (1989) Reduction mammaplasty in central block. In: Annals of the international symposium recent advances in plastic surgery. São Paulo, pp 306–313

Erfon J, Barbosa V, Brasil A Jr (1992) Reduction mammaplasty in a single block. In: Hinderer UT (ed) Plastic surgery, vol 2. Elsevier, Madrid, pp 629–634

Erfon J, Hochberg J, Ardenghy M, Cols (1996) Central block reduction mammaplasty and mastopexy. In: Proceedings of the 65th annual scientific meeting of the American society of plastic and reconstructive surgeons, vol 19. Dallas, pp 176–178

Fischer JP, Cleveland EC, Shang EK, Nelson JA, Serletti JM (2014) Complications following reduction mammaplasty: a review of 3538 cases from the 2005-2010 NSQIP data sets. Aesthetic Surg J 34(1):66–73

Foustanos A, Panagiotopoulos K, Skouras G (2011) Intraoperative modification of Pitanguy technique of reduction mammaplasty for elevation of the nipple-areola complex in case of severe breast ptosis. Aesthetic Plast Surg 35:55–60

Franco T, Rebello C (1977) Cirurgia Estética, 1ª Edição. Atheneu, Rio de Janeiro, p 211

Jurado J (1979) The vertical dermal-glandular flap of inferior single pedicle in breast surgery. Presented at the 7th international congress of plastic and reconstructive surgery, Rio de Janiero

Karsidag S, Akcal A, Karsidag T, Yesiloglu N, Yesilada AK, Ugurlu K (2011) Reduction mammaplasty using the free-nipple-graft vertical technique for severe breast hypertrophy: improved outcomes with the superior dermaglandular flap. Aesthetic Plast Surg 35:254–261

Kececi Y, Sir E, Gungor M (2015) Patient-reported quality-of-life outcomes of breast reduction evaluated with generic questionnaires and the breast reduction assessed severity scale. Aesthetic Surg J 35(1):48–54

Lassus C (1987) Breast reduction: evolution of a technique. A single vertical scar. Aesthetic Plast Surg 11:107

Lexer E (1912) Hypertrophiebei der Mammae. Munch Med Wochen Chr 59:2702

Lima JC (1979) Breast reduction: new method and refinements. In: Ely JF (ed) Transaction of the seventh international congress of plastic reconstructive surgery. Cartigraf, Rio de Janeiro, p 508

McKissock PK (1972) Reduction mammaplasty with a vertical dermal flap. Plast Reconstr Surg 49(3):245–252

Orlando JC, Guthrie RH Jr (1975) The superomedial dermal pedicle for nipple transposition. Br J Plast Surg 28(1):42–45

Peixoto G (1980) Reduction mammaplasty: a personal technique. Plast Reconstr Surg 65(2):217–225

Peixoto G (1984) Reduction mammoplasty. Aesthetic Plast Surg 8:231–236

Pitanguy I (1967) Surgical treatment of breast hypertrophy. Br J Plast Surg 20(1):78–85

Pitanguy I (1976) Personal preferences for reduction mammaplasty. In: Goldwyn R (ed) Plastic and reconstructive surgery of the breast. Little Brown, Boston, p 167

Robbins TH (1977) A reduction mammaplasty with the areola-nipple based on an inferior dermal pedicle. Plast Reconstr Surg 59(1):64–67

Schwarzman E (1930) Die technik der Mammaplastik. Chirurg 2:932

Sepúlveda A (1981) Tratamento das Assimetrias Mamárias. Ver Bras Cirurgia 71:11–18

Silveira-Neto E (1976) Mastoplastia redutora setorial com pedículo areolar interno. In: XIII Congresso Brasileiro de Cirurgia Plástica, Porto Alegre, RS, Brazil

Skoog T (1963) A technique of breast reduction; transposition of the nipple on a cutaneous vascular pedicle. Acta Chir Scand 126:453–465

Souza Pinto EB et al (1983) Dermoadipose and adenoadipose flaps in mammaplasty. Aesthetic Plast Surg 7(7):101–108

Spector JA, Karp NS (2007) Reduction mammaplasty: a significant improvement at any size. Plast Reconstr Surg 120(4):845–850

Strombeck JO (1960) Mammaplasty: report of a new technique based on the two-pedicle procedure. Br J Plast Surg 13:79–90

Thorek M (1942) Plastic surgery of the breast and the abdominal wall. Charles C Thomas, Springfield

Weiner PL, Aiache AE, Silver L, Ttitanonda TA (1973) Single dermal pedicle for nipple transposition in subcutaneous mastectomy reduction mammaplasty or mastopexy. Plast Reconstr Surg 510(2):115–120

Wise RJ, Gannon JP, Hill JR (1963) Further experience with reduction mammaplasty. Plast Reconstr Surg 32(1):12