

## Minimal-Scar Breast Reduction and Mastopexy

Miriam Pedron, M.D.

Porto Alegre, Brazil

### Abstract.

**Background:** Classic breast reduction and mastopexy techniques leave a vertical scar, but are difficult to apply in cases requiring a large amount of breast tissue removal. This report describes a new breast reduction technique using a vertical incision for resections involving less than 600 g of tissue removal and an inverted T incision for larger resections. Results for the new technique are reported.

**Methods:** For 800 women, the reported technique was used for reduction mammoplasty (n = 640) and mastopexy (n = 160). Peridural anesthesia was used for 90% of the patients, and general anesthesia for 10%. The minimum follow-up period was 6 months for 90% of the patients. All the patients underwent mammary x-ray and ultrasonography before surgery.

**Results:** A short scar was obtained for all the patients. A new intervention for breast reduction was chosen by 16 patients (2%). For all the patients followed, the immediate results (projection of the areola and upper pole) remained unaltered at a late follow-up evaluation. There were no cases of infection or seroma. Hematoma occurred in 8 patients who underwent unilateral breast reconstruction, and 16 patients experienced temporary reduced sensitivity.

**Conclusions:** The new technique was effective in leaving a short scar and maintaining immediate results in the long term. Liposuction limited to the lateral chest wall prevented complications associated with breast tissue.

**Key words:** Breast—Breast reduction—Mastopexy—Plastic surgery

---

The breast reduction and mastopexy techniques described in the works of Lotsch and Grohbandt [10], Arié [1], Pitanguy [19], Ribeiro and Backer [22],

Peixoto [17], Lassus [5], Lexer [8], Marchac and De Olarte [11], and others [9,12] leave a vertical scar. However, this technique is difficult to apply in cases requiring a large amount of breast tissue removal.

In 1987, we began developing a new vertical scar procedure to resect up to 600 g of tissue. In addition, for larger resections, we proposed an inverted T scar with a maximum 3-cm horizontal segment at the inframammary crease [11]. In addition to leaving a very short scar, the new technique helps to maintain immediate results: projection of the upper pole and preservation of the blood supply to the areola (use of upper and medial pedicles).

The removal of breast tissue at the base and center is determined according to the type of breast. The proposed technique prevents the occurrence of areola and fat necrosis, seromas, and late breast deformities. To maintain the medial pole and areola projection, the inferior base pedicle is used. Liposuction, when necessary, is used only in the lateral chest wall. The immediate results are maintained in the late postoperative period, decreasing the patient's stress over a potential second intervention.

The new surgical technique offers the following advantages: minimal scar; preservation of Cooper's ligament, avoiding undermining of the breast; liposuction limited to the lateral chest wall; upper pole starting at the first intercostal space, defining of a natural breast shape; and maintenance of immediate postoperative results.

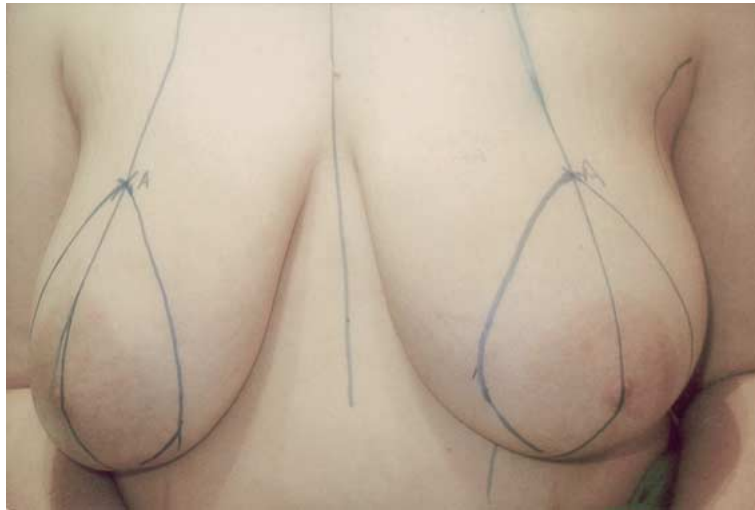
The objective of the current report is to describe the results obtained with the new technique used for 800 women who underwent reduction mammoplasty and mastopexy.

### Materials and Methods

This study investigated 800 patients who underwent surgery between 1987 and 2001. Reduction mam-

---

Correspondence to M. Pedron, M.D., Rua Dr. Barbosa Gonçalves, 660 Bairro Chácara das Pedras 91330-320, Porto Alegre, RS, Brazil; *email*: mlpedron@terra.com.br



**Fig. 1.** External furcula line: xiphoid appendix, midbreast line, and points A, B, and C.

**Table 1.** Patient age.

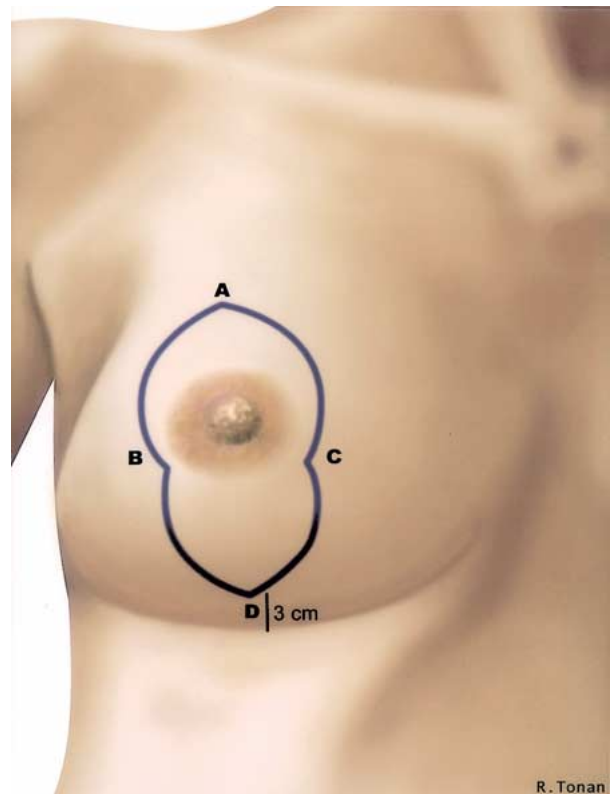
Age (years)	Patients (n)	%
17–30	184	23
30–45	424	53
45–70	192	24
Total	800	100

moplasty was performed for 640 patients (including 56 cases of unilateral breast reconstruction), and mastopexy was performed for 160 patients. Peridural anesthesia was used for 90% of the patients, with the remaining 10% receiving general anesthesia. The ages of patients undergoing mammoplasty ranged from 17 to 75 years (mean, 40 years). In the mastopexy group, the ages ranged from 28 to 65 years (mean, 36 years) (Table 1). It was found that 20% of the patients were smokers and 2% were diabetic. The anatomopathologic examinations did not show any neoplastic cellular changes for any of the patients.

The minimum postoperative follow-up period was 6 months for 90% of the patients. Of these, 20% were followed for 3 years, and 20 patients are still being followed at this writing after more than 10 years. Before the surgery, all the patients underwent mammary x-ray and ultrasonography.

### Technique

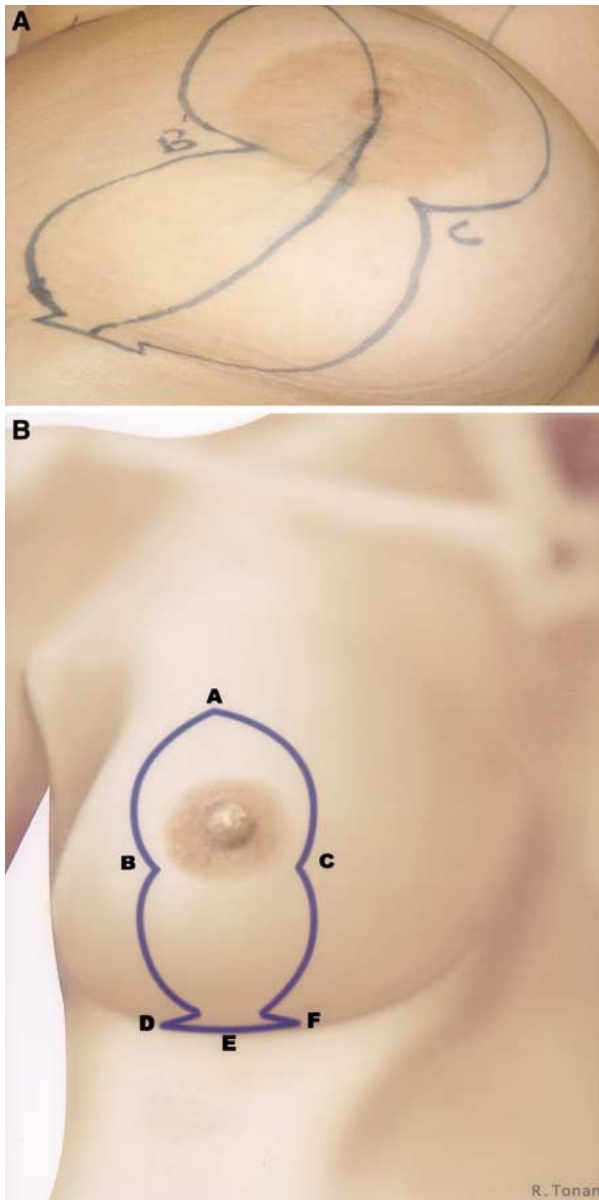
With the patient standing or sitting, a medial line is drawn on the furcula external to the xiphoid appendix. A second line is drawn starting at the midclavicular point, passing through the nipple, and ending at the medial point of the inframammary crease. The new location for the areola is set 16 to 19 cm from the midclavicular line. The distance between the midsternal line and point B ranges from 7 to 10 cm. The patient's biotype and the desired breast volume are



**Fig. 2.** Points A, B, C, and D for the vertical scar.

considered in determining the exact location of the areola. Then the index finger is placed in the inframammary crease, pointing up. This point is projected and marked on the breast's anterior portion (Fig. 1A). The exact location of the new areola corresponds to the intersection between the transposed point and the breast meridian (Pitanguy's point A) [20].

An ellipsis is drawn, starting at the site defined for the new areola (point A). The length of these lines



**Fig. 3.** (A) Points A, B, and C for the inverted T scar. (B) Points A, B, C, D, and F for a 1- to 3-cm horizontal segment at the inframammary crease.

and the distance between them depends on the patient's biotype and the desired breast volume. The most important aspect is the amount of skin and breast tissue that will remain to reshape the breast (Fig. 1) following natural skin lines (Langer's lines) [25], thus favoring skin retraction. This type of non-circular incision prevents nipple flattening and favors projection of the areola. One ellipsis will be periareolar with an inferior border, which will be more cranial the larger the ptosis of the nipple[areola] complex. Another ellipsis is drawn caudally starting at points B and C, which will be further away from the inframammary crease the larger the breast ptosis

**Table 2.** Breast tissue volume removed.

Weight (g)	Patients (n)
50–200	96
200–400	138
401–600	238
> 600	72
200–400 <sup>a</sup>	56
Total	640

<sup>a</sup>Unilateral reduction in mammary reconstruction.

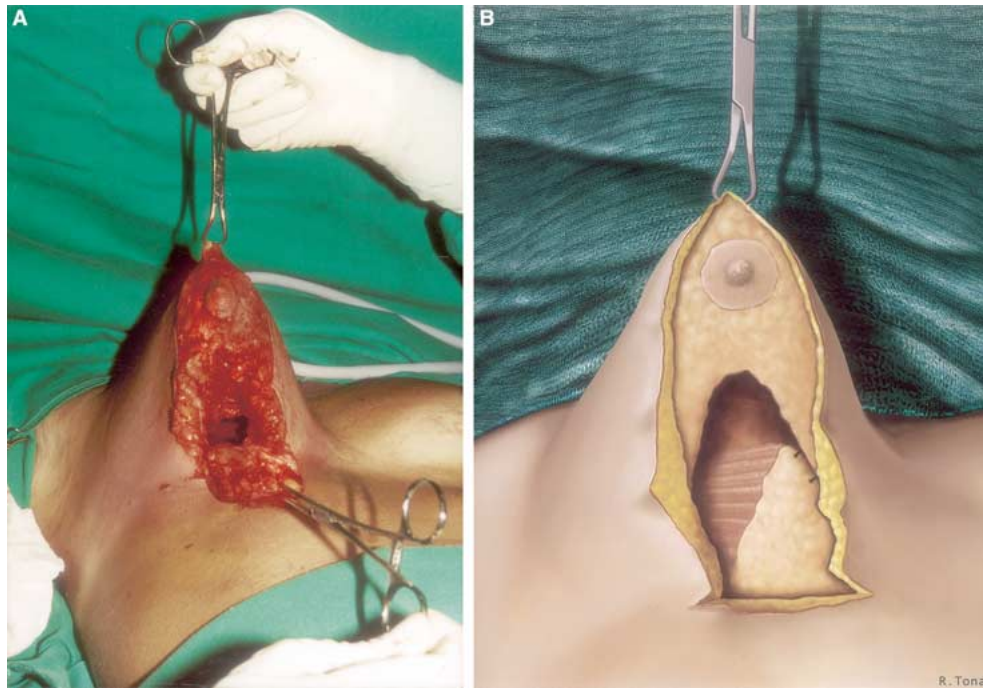
(in resections no larger than 600 g) (Fig. 2A). The result will be a vertical scar measuring about 7 to 10 cm [6,7].

For larger breasts (Fig. 3A), a horizontal line up to 3 cm long is drawn in the inframammary crease. This line will be the base of a triangle whose sides meet the lines of the ellipsis, each side measuring approximately half the base dimension (Fig. 3B) [3].

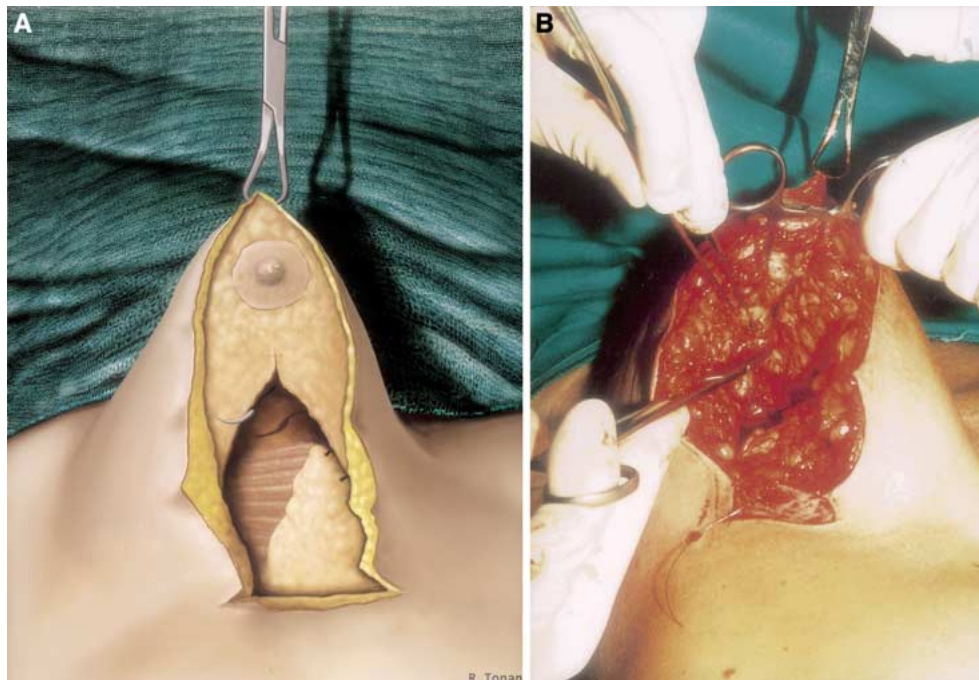
Liposuction is performed for patients with fatty tissue in the lateral chest wall so as to ensure a natural breast shape. The incision for liposuction is made laterally to those previously described [4,12,24].

The Schwartzmann [23] technique is used to decorticate the entire area within the boundaries of the lines previously drawn. An incision is made horizontally 2 cm below the areola perpendicular to the muscular plane and extended up to the fourth intercostal space. This allows construction of an inferior pedicle flap with a vascular supply from the fourth and fifth intercostal spaces (Fig. 4A). The breast tissue is detached from the pectoral muscle up to the first intercostal space.

Next, amputation of the breast base is performed up to the first intercostal space, preserving the conical shape of the remaining gland and the tissue of the upper pole. The amount resected depends on the breast volume and the result expected. Most of the patients in this study had 600 g or less of breast tissue removed (Table 2). For breasts with a wide base, a keel resection is used, as described by Pitanguy [18]. With this resection, vascularization is preserved medially through the internal thoracic artery, which is responsible for 60% of the blood supply to the breast (laterally and superiorly), and through the lateral thoracic artery, which supplies 30% of the gland. This ensures breast viability, preserves sensitivity and lactation, and prevents dehiscence and necrosis. The inferior base pedicle flap is sutured to the pectoral muscle, ensuring fullness for the medial pole and the central portion of the breast. This will be maintained in the late postoperative period (Fig. 4B). The breast is sutured with local flaps at the first and second intercostal spaces using nonresorbable stitches to create the upper pole, avoiding a conical shape. The medial and lateral pillars are attached to the pectoralis major muscle (Fig. 5A and B). The projection of the areola also is obtained with nonresorbable sutures by approaching the medial and



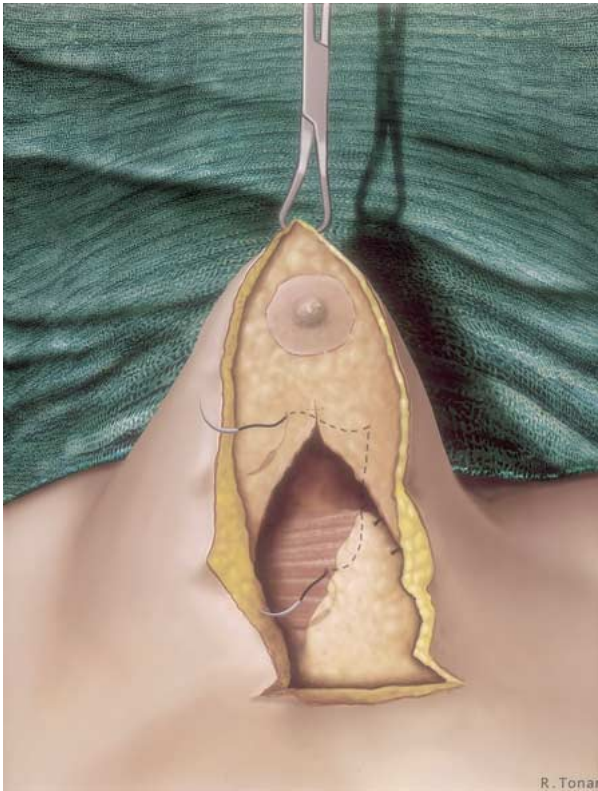
**Fig. 4.** (A) Inferior pedicle (6 × 4 × 2 cm). (B) Attachment of the inferior pedicle to the medial and central breast poles.



**Fig. 5.** (A) Detachment and first point at the first intercostal space approaching the lateral and medial pillars, which are attached to the pectoralis major muscle. (B) Points at the first and second intercostal spaces for upper pole projection.

lateral pillars and the inferior pedicle flap (Fig. 6). This prevents the formation of dead space. The dermal and epidermal layers are sutured by uniting points B and C. Anatomically, the nipple[areola] complex is positioned at the desired location, with no posterior change in position (Fig. 7).

The design and resection of breast tissue may be adjusted to each case. Resection is calculated according to the surgeon's ability. The Guilles hook is placed at the junction of points B and C for the resection, and an Allis' clamp is used to remove the excess vertical skin (Fig. 8). The resulting scar is



**Fig. 6.** Points below the areola approaching the lateral and medial pillars and inferior pedicle, preventing formation of dead space and promoting projection of the areola.

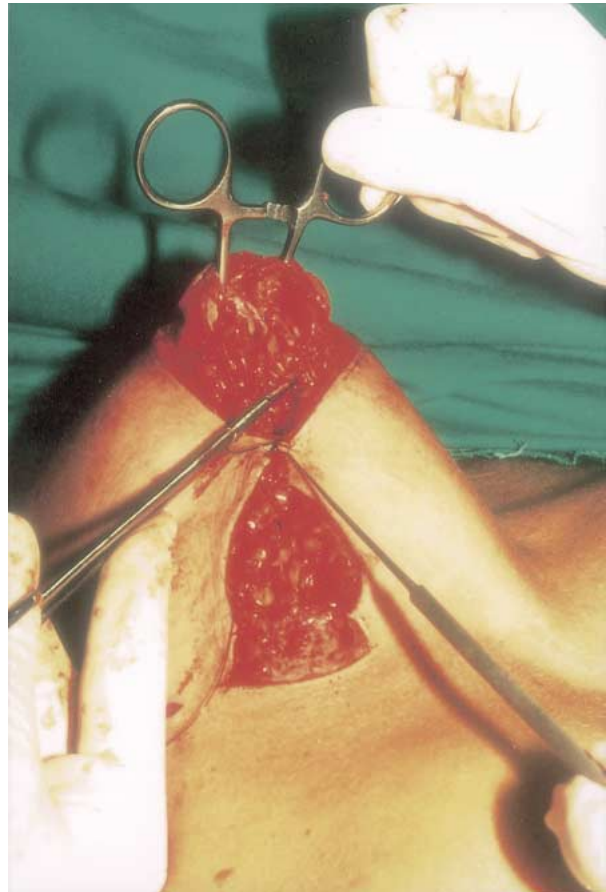
vertical in resections involving up to 600 g of tissue, depending on the patient's age and the glandular tissue content (breast tissue without fatty tissue). For resections 600 g or larger in older patients, or in cases of little available glandular tissue, the final scar is shaped as an inverted T, with a maximum 3-cm horizontal segment at the inframammary crease. Routine round-block suture<sup>2</sup> with Vicryl 3-0 thread is used.

Breast tissue is sutured subcutaneously with simple inverted stitches using resorbable monocryl 4-0, starting at the inferior portion of the incision (inframammary crease) and upto the areola. An intradermal subcuticular suture with monocryl 5-0 (Fig. 9) completes the closure.

The nipple[areola] complex is sutured with intradermal mononylon 5-0. Suture strips (Cicagraf) and micropore tape are used (Fig. 10). No drain tube is required. The final dressing is applied using gauze and cotton. Bandages are removed within 24 h and replaced with a compressive elastic dressing, which should be maintained for 1 month.

## Results

The postoperative scar was minimal in all the patients. Both the immediate and late results were sat-

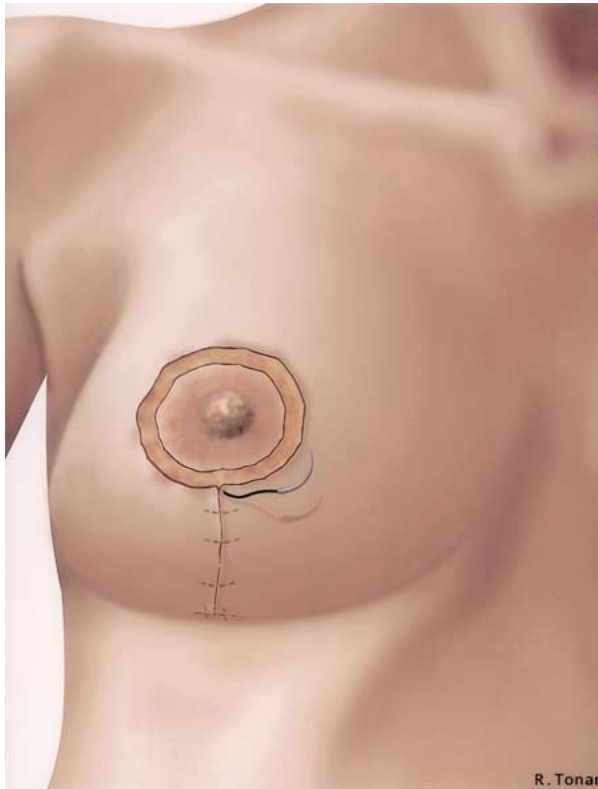


**Fig. 7.** Point approaching B and C. The areola easily stays at the projected position.

isfactory and did not require a second intervention for correction of ptosis. Sixteen patients (2%) chose to undergo additional surgery for further reduction of their breast size. For all the patients followed, the results related to the projection of the areola and the upper pole remained unaltered (Figs. 11, 12, 13, and 14). There were no cases of infection. Hematoma occurred in eight patients in the unilateral mammary reconstruction group. Sixteen patients experienced temporary reduced sensitivity. Seromas were not observed in any patient.

## Discussion

Peridural anesthesia is used in breast reduction and mastopexy procedures because it ensures a more comfortable recovery for patients. Tracheal intubation is unnecessary, and the occurrence of nausea and vomiting is less frequent. The described surgical technique requires 40 to 90 min for completion. The patient is maintained in a dorsal recumbent position during the entire procedure, preventing changes in blood pressure. Skin marking is based on the method described by Peixoto [17] and Ariê [1], except that we



**Fig. 8.** Round block: junction of points D, E, and F for calculation of vertical skin excess.

use one periareolar line with an inferior border, which will be more cranial the larger the ptosis of the nipple[areola] complex, and another line under the areola, which will be further away from the inframammary crease the larger the breast ptosis, preventing infra-areolar flattening.

In our cases, we were not strict about preserving 5 cm between the areola and the inframammary crease, as recommended by some authors [14,15]. Rather, in our experience, this distance varied according to the result desired by each patient, and we believe it may be as large as 10 cm with no risk of ptosis. Also, we have observed that the final result depends on how the breast is reshaped. After reshaping, the excess skin is resected at the end of the procedure, making additional intervention unnecessary. Thus, the patient is spared the anxiety concerning a potential second surgical procedure.

In cases that require a breast tissue resection larger than 600 g, an inverted T scar with a maximum 3-cm horizontal segment at the inframammary crease is the most adequate option. The decision whether to use the inverted T technique is made before surgery, based on the possibility of skin retraction and its limitations, which may be observed when prostheses are used to increase breast volume or to correct ptosis. Retraction is observed to decrease 6 months postoperatively, after which breast ptosis returns.

At the inflammatory stage, ptosis may appear to be corrected because of edema. However, later in the postoperative period, ptosis may be accentuated, even more than before surgery [21]. When the skin detachment is undermined, the Cooper's ligament trabeculae cross the parenchyma and extend into the deep fascia, compromising the ligaments. Because of this, the probability of marked ptosis is more likely in the postoperative period.

We have used conventional liposuction only to reduce the axillary extension and to improve the contour of the lateral pole. Liposuction was never used to remove fatty tissue from the breast. We believe that this precaution can prevent the appearance of calcifications, which may be taken for malignant microcalcifications (even if presenting a benign radiological aspect) and require differential diagnosis [9,13]. These calcifications would expose the patient to additional stress, especially considering the high incidence of breast carcinoma in our environment [16]. Liposuction also may result in depressions, tissue adhesion, and different types of retractions (Fig. 15A and B). The tunnels formed by liposuction in the lateral chest wall are not connected to the virtual space created by the described technique, which reduces the possibility of seroma formation.

The flap described by Ribeiro [21] has proved to be safe and effective with regard to tissue vitality. With the current technique, Ribeiro's flap is used to aid in the projection of the medial pole and central portion of the breast 2 cm above the areola. Originally, the technique was designed to project the upper pole. However, we have defined the upper pole to begin at the first and second intercostal spaces, which contradicts previous studies based on a conical breast shape with the areola on the apex (Fig. 16A and B). The inferior pedicle flap does not favor a harmonious profile because it often does not reach the first and second intercostal spaces. As previously described in this report, we achieve projection of the upper pole by joining the local flaps to the pectoralis major muscle at the first and second intercostal spaces, thus ensuring stability of the upper pole and providing a more natural shape to the breast (Fig. 17A and B).

## Conclusion

The proposed technique proved to be effective for achieving minimal scarring and for long-term maintenance of the areola and upper pole projection (first intercostal space). Liposuction in the lateral chest wall resulted only in a more natural breast shape and prevented complications. The occurrence of infection, hematoma, reduced sensitivity, and seroma was not significant. Additional interventions were performed for only two patients who desired a further decrease in their breast sizes.

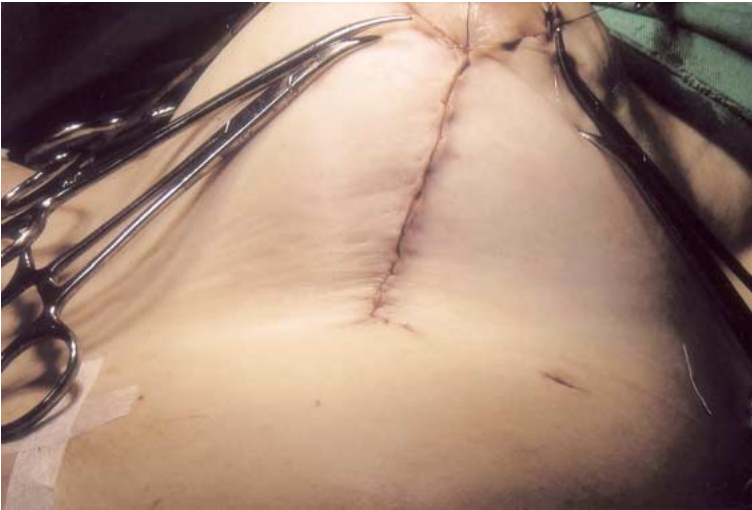


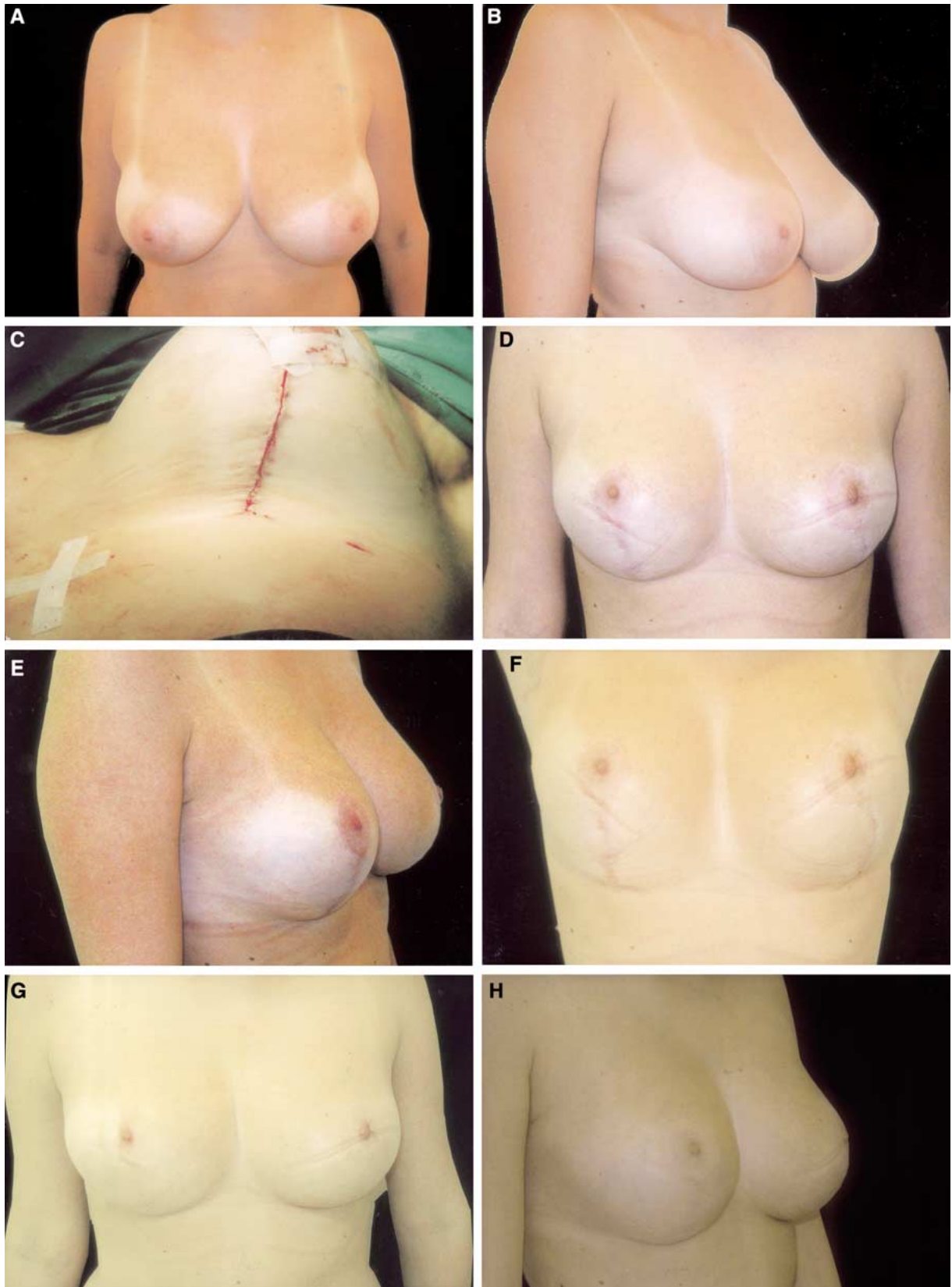
Fig. 9. Final suture.



Fig. 10. Final dressing.

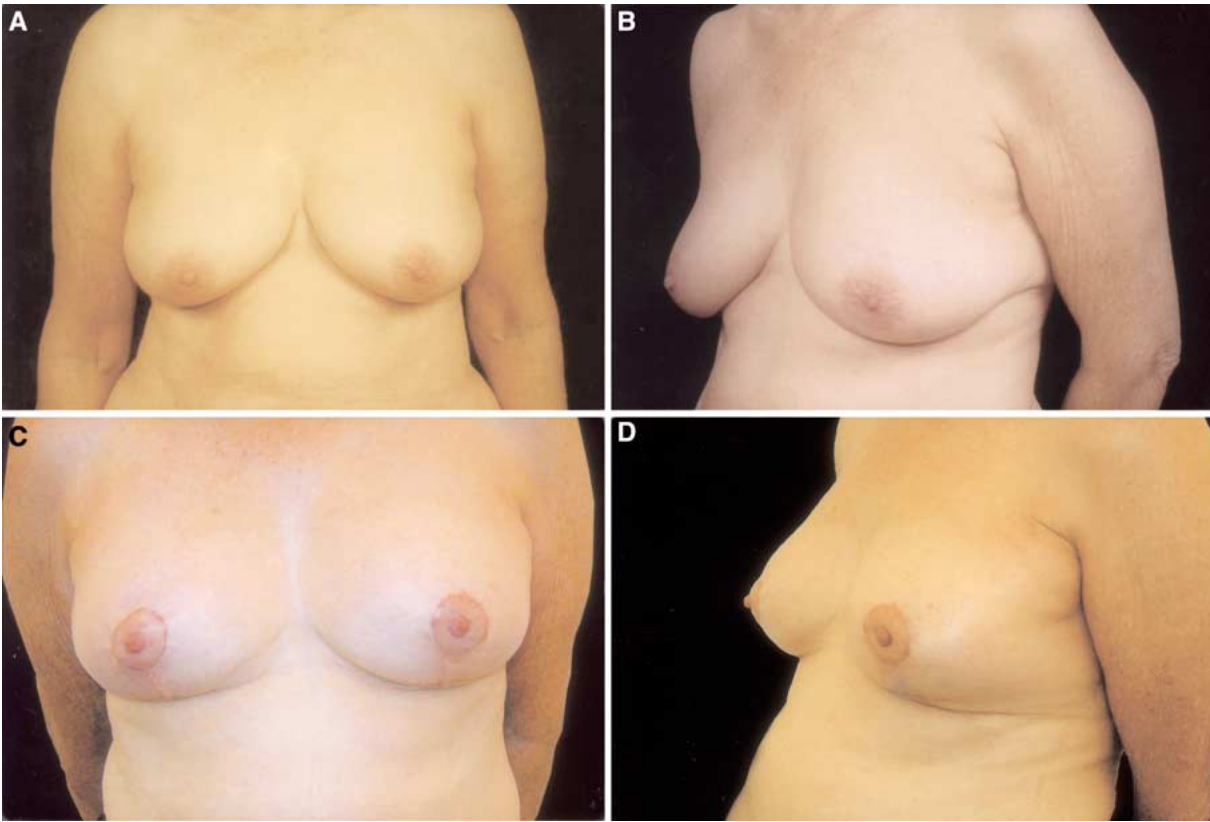
## References

1. Arié G: A new technique of mammoplasty. *Rev Latinoam Cir Plast* 3:23, 1957
2. Benelli LA: New periareolar mammoplasty: Round block technique. *Aesth Plast Surg* 14:93, 1990
3. Ely JF: Guidelines for reduction mammoplasty. *Ann Plast Surg* 6:424, 1981
4. Góes JCS. Ultrasound-assisted lipoplasty (UAL) in breast Surgery. *Aesth Plast Surg* 26:1–9, 2002
5. Lassus C: Breast reduction: Evolution of a technique: A vertical single scar. *Aesth Plast Surg* 11:107, 1989
6. Lejour M: Evaluation of fat in breast tissue removed by vertical mammoplasty. *Plast Reconstr Surg* 99:386, 1997
7. Lejour M, Abboud M: Vertical mammoplasty without inframammary scar and breast liposuction. *Perspect Plast Surg* 4:67, 1990
8. Lexer E: Ptosis operation. *Clin Monatsbl Augenh* 70:464, 1923
9. Liberman LA: Radiography of microcalcifications in stereotaxic mammary core-biopsy specimens. *Radiology* 190:223, 1994
10. Lotsch GM. Grohbandt: Operationen an der weibliche Brustdrüse. Chir Oper Leipzig 1955
11. Marchac D, De Olarte G: Reduction mammoplasty and correction of ptosis with a short inframammary scar. *Plast Reconstr Surg* 69:45, 1982
12. Matarasso A, Courtiss EH: Suction mammoplasty: The use of suction lipectomy to reduce large breasts. *Plast Reconstr Surg* 87:709, 1991
13. Mendelson EB: Evaluation of the postoperative breast. *Radiol Clin North Am* 30:107, 1992
14. Pedron ML: *Cicatriz mínima em mamoplastia redutora*. Anais do Congresso Brasileiro de Mastologia: Paraná, Brazil, pp. 70–71, 1998 In press
15. Pedron ML: *Mamoplastia redutora com cicatriz mínima: Minisymposium of Fortaleza*. International Society of Aesthetic Plastic Surgery: Ceará, Brazil, February 1997 In press.
16. Pedron ML: Systematization in oncologic mammoplasty. *Rev Soc Bras Cir Plast* 16:47, 2001
17. Peixoto G: Reduction mammoplasty: personal technique. *Plast Reconstr Surg* 65:217, 1980
18. Pitanguy I: Breast hypertrophy: Contribution to its treatment. *Rev Latinoam Cir Plast* 7:142, 1963

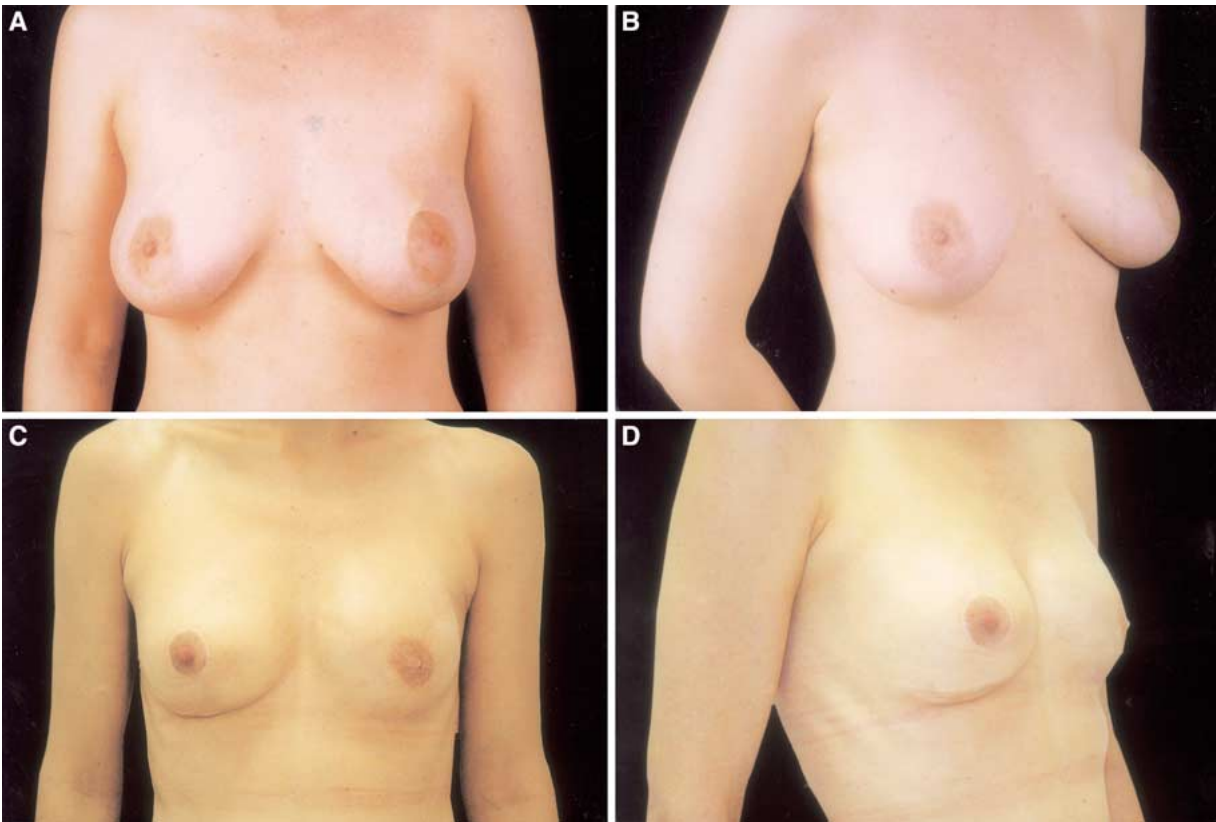


**Fig. 11.** (A) Preoperative view of a 38-year-old patient. (B) Postoperative view showing harmonious profile from the clavicle to the areola. (C) Immediate postoperative result. (DEF) Postoperative view 3 months after removal of 780 g from the right and 750 g from the left breast. (GH) View of the patient 3 years after surgery.

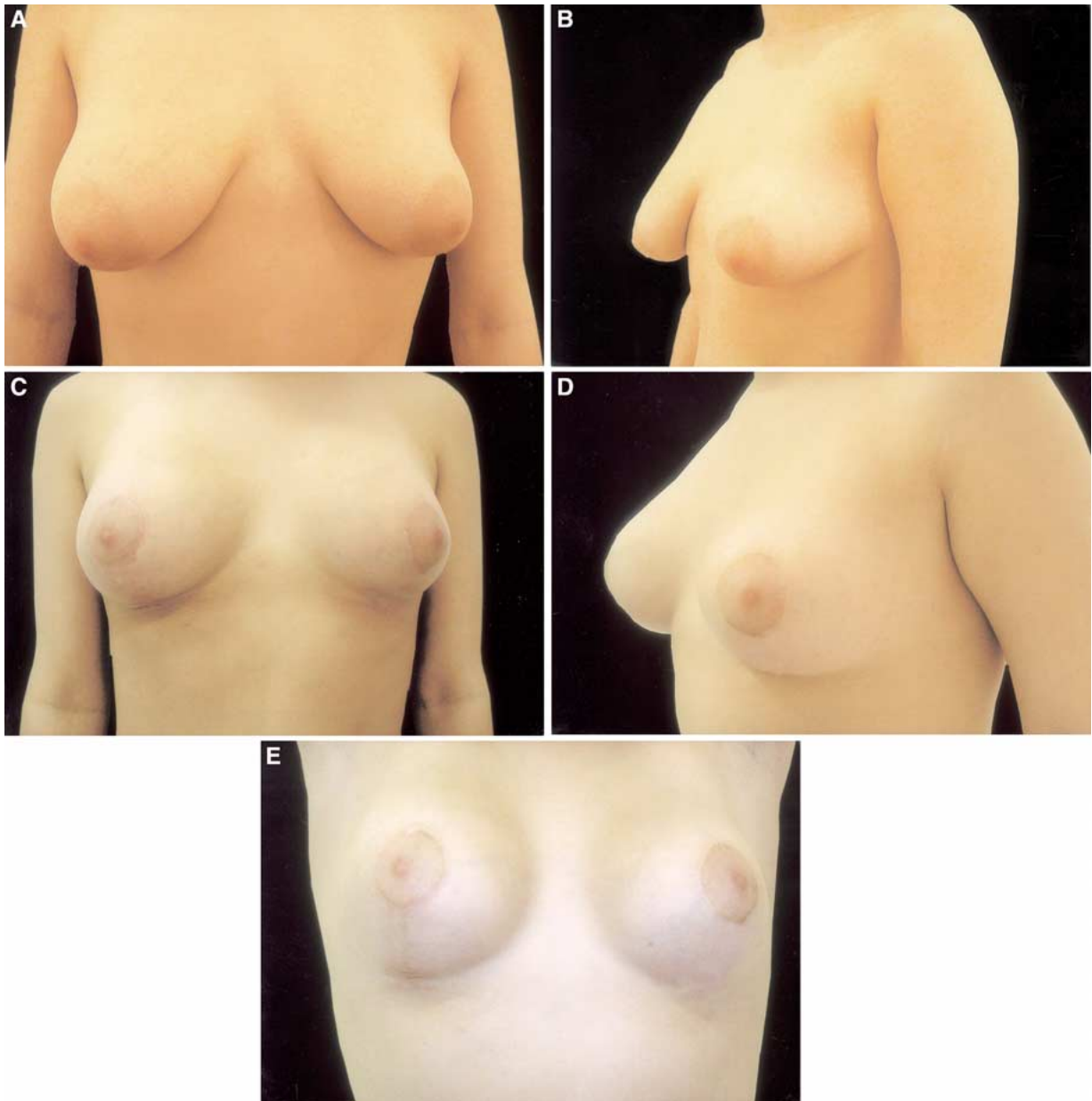




**Fig. 12.** (AB) Preoperative view of a 75-year-old patient. (CD) Postoperative view 3 years after removal of 280 g from the left and 250 g from the right breast (mastopexy).

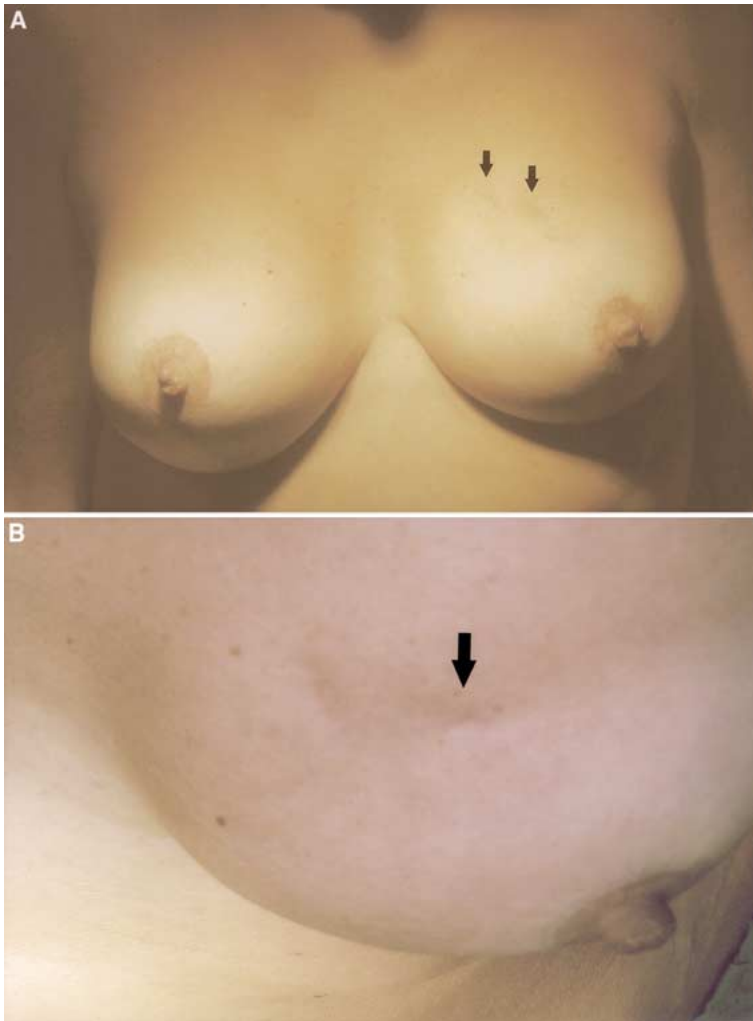


**Fig. 13.** (A) Preoperative view of a 36-year-old patient with left breast carcinoma. (B) Right breast hypertrophy and ptosis. (C) Postoperative view 2 years after radical mastectomy with immediate reconstruction using a prosthesis. (D) Removal of 280 g from left breast and right breast mastopexy.

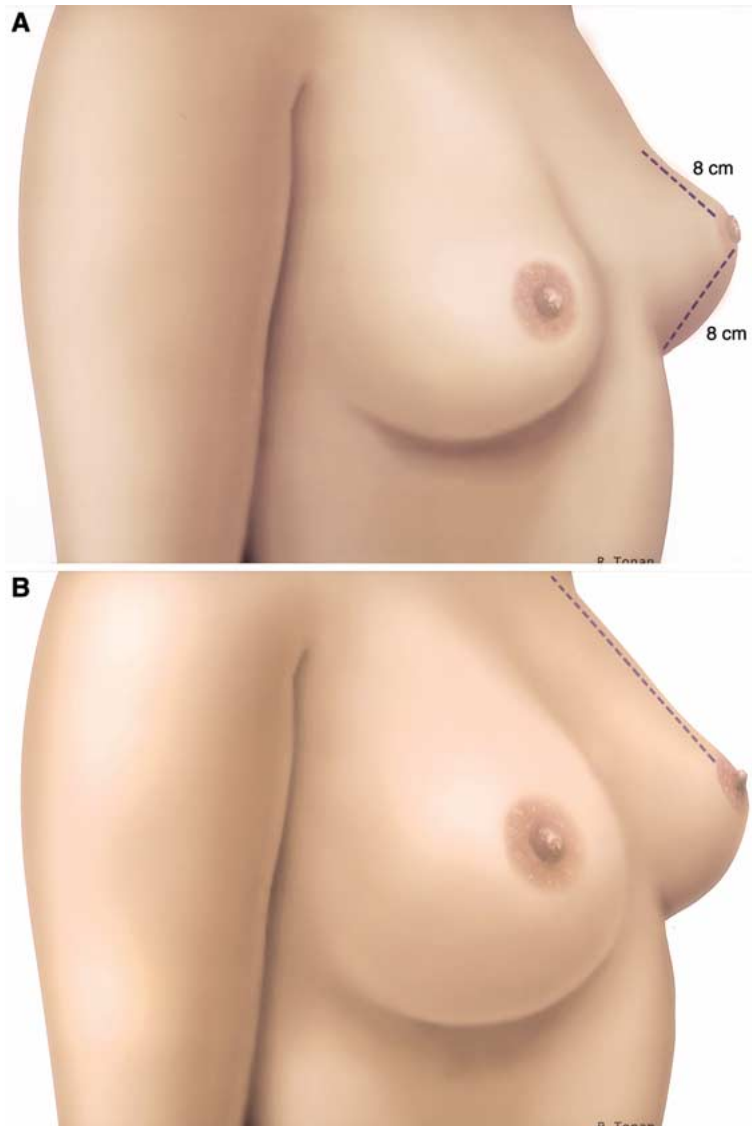


**Fig. 14.** (AB) Preoperative view of a 19-year-old patient who underwent mastopexy and removal of 220 g of breast tissue. (CDE) Postoperative view (after 3 years) of the same patient after removal of 220 g from the left and 200 g from the right breast (mastopexy).

19. Pitanguy I: Breast hypertrophy. In: *Transactions of the International Society of Plastic Surgeons*. Livingstone: London/Edinburgh, 1959/1960
20. Pitanguy I: Surgical treatment of breast hypertrophy. *Br J Plast Surg* **20**:78, 1967
21. Ribeiro L: Pedículo na técnica de Peixoto. In: Ribeiro L (ed) *Cirurgia plástica da mama*. Medsi: Rio de Janeiro pp 226–232, 1989
22. Ribeiro L, Backer E: Mastoplastia com pedículo de seguridad. *Rev Esp Cir Plast* **6**:223, 1973
23. Schwartzmann E: Avoidance of nipple necrosis by preservation of corium in one-stage plastic surgery of the breast. *Rev Chir Struct* **7**:206, 1937
24. Toledo LS, Matsudo PKR: Mammoplasty using liposuction and the periareolar incision. *Aesth Plast Surg* **13**:9, 1989
25. Well SA, Young VL, Andriole DA: *Atlas of breast surgery*. St. Louis, Mosby, pp 3–15, 1997



**Fig. 15.** (A) Complication of breast liposuction and depression at the upper pole (adhesion). (B) Same patient in dorsal decubitus.



**Fig. 16.** (A) Breast showing the classical conical shape. (B) Harmonious profile showing an imaginary line from the midclavicle to the areola.



**Fig. 17.** (A) Postoperative breast with a conical shape. (B) Postoperative breast with a harmonious profile from the clavicle to the areola.