

# Structured Mammoplasty (Breast Reduction and Mastopexy with Silicone Implants): Standardization of Technique for Predictable Results

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**Background:** Several methods have been developed for the treatment of ptosis and breast hypertrophy, with good early results but with dissatisfaction in the long term, due to loss of volume and projection of the upper pole and recurrence of ptosis. In the face of this adversity, the purposes of the present study were to describe a surgical technique of breast reduction and mastopexy with silicone implants, named structured mammoplasty, and to present the outcomes of patients who underwent this technique.

**Methods:** The structured mammoplasty technique with round silicone prostheses (surgical marking and stages), performed on 100 patients who were operated on between 2017 and 2020 and were followed up for a minimum of 12 months, was described. Postoperative and patient satisfaction assessments were made.

**Results:** No major complications were observed in an average of 18 months of follow-up (ranging from 12 to 30 months). The maintenance of the outcome with a projected upper pole and rounded breasts resulted in a high level of satisfaction.

**Conclusions:** Structured mammoplasty with silicone implants is a safe and predictable option, ensuring a long-lasting shape. It can be applied to any breast that has surplus skin, making it a more reliable option in the arsenal of the plastic surgeon. (*Plast Reconstr Surg Glob Open* 2022;10:e4073; doi: 10.1097/GOX.0000000000004073; Published online 27 January 2022.)

## INTRODUCTION

Mastopexy with implant placement has always posed a challenge for the plastic surgeons due to the variability and complexity of several factors involved, such as anatomic (the quality and amount of exceeding skin, dystopia of the nipple–areolar complexes, mammary and thoracic asymmetries), extrinsic (severity and daily habits, mainly physical activities), and psychologic factors (that reflect the patient expectation).<sup>1–3</sup> In addition, patients presenting breast hypertrophy and severe ptosis have another adversity that must be overcome: the excess breast parenchyma.<sup>1</sup> Usually, the treatment of choice is traditional reduction mammoplasty.

For most surgeons, the projected upper pole and absence of ptosis at the lower pole are the goals to achieve.<sup>4</sup> With similar expectations, many patients end up frustrated with the long-term outcome when traditional approaches are applied. Aiming to overcome these obstacles, the purposes of this study were to describe a comprehensive surgical technique for breast reduction and mastopexy with silicone implants, named structured mammoplasty, as well as to present the outcomes of patients who underwent this technique.

## METHODS

This observational study, based on a series of cases conducted by the authors, describes technical aspects regarding the indication, execution, and monitoring of the structured mammoplasty technique, which was improved by the authors based on well-established techniques on breast reduction and mastopexy. There were no interventions other than those necessary for the treatment of

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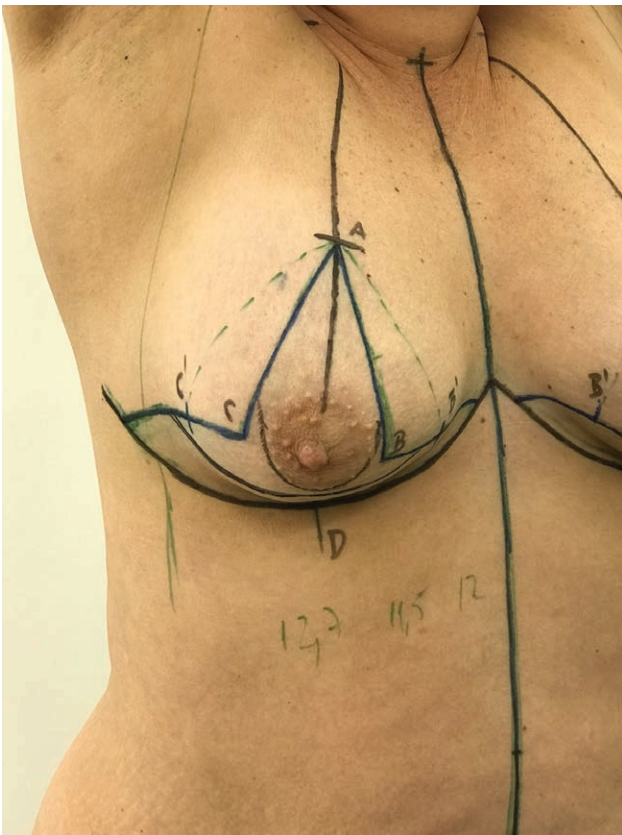
patients, and there were no sources of funding and conflicts of interest for the development of this study.

Structured mammoplasties were performed in Piracicaba and São Paulo, Brazil, between 2017 and 2020 in 100 patients. Female patients with complaints of hypertrophic breasts, pseudoptosis or breast ptosis, who desired round implants and upper-pole fullness were selected. Patients who were aesthetically dissatisfied with the results from primary breast surgeries and presented the same complaints mentioned above were also included in the study. The prostheses used were MemoryGel Siltex silicone breast implants by Mentor (Johnson & Johnson), with volume varying between 275 and 500 mL, according to the horizontal diameter of the breast and the patient's desire.

### Preoperative Marking

The marking of patients was based on the Wise<sup>5,6</sup> pattern, for symmetrization of the remaining skin dimensions that would form the new breasts, with some modifications (Fig. 1), as detailed in the Supplemental Video. (See Video [online], which shows the preoperative marking of a patient subject to structured mammoplasty.) The description of preoperative marking is as follows:

- (a) Imaginary point A: it consists of the projection of the ideal point for the upper limit of the areola, through bimanual compression of the lower pole of the breast;



**Fig. 1.** Preoperative marking of points A, B, B', C, C', and D.

### Takeaways

**Question:** With traditional mammoplasty techniques, there is an early loss of the upper pole projection, generating dissatisfaction to the patient in the medium and long term.

**Findings:** The standardization of the structured mammoplasty technique allowed us to obtain more predictable, long-lasting results with a higher degree of patient satisfaction.

**Meaning:** Breast structuring with silicone implants allows the maintenance of the outcome with a projected upper pole and rounded breasts, achieving long-lasting results and a high level of satisfaction.

- (b) Marking of points B and C: which coincide with point D when drawn horizontally and with a length of approximately 12 cm for small breasts, and 13 cm for large breasts, always with skin traction;
- (c) Connecting lines between point AB and AC (pillars): imagining through compression of the medial and lateral pole the desired result in terms of bulging;
- (d) Marking the resection of the lower pole, always thinking about the roundness of the breast. Points B' and C' are marked 4 cm away from points B and C, respectively. For breast rounding, it is important that the distance AB' is 0.5–1 cm (at most) greater than the length AB and that the length AC' is 0.5–1 cm greater than AB';
- (e) Marking of the lower protection pedicle, with large dimensions for safety and subsequent adjustment. If the lower pole is of small dimensions, the largest possible dimension must be preserved;
- (f) Marking of the pedicle of the nipple-areolar complex, preferably superior;
- (g) Checking between the sides for symmetrization, including the mammary groove so that they are leveled throughout.

### Surgical Procedure

Periareolar de-epithelization within the areola pedicle marking was cranially initiated 1 cm caudal to the imaginary point A (for safety reasons).<sup>4</sup> Breast parenchyma was sectioned perpendicularly to the musculature at the upper limit of the lower protection flap (below the areola), followed by the detachment of the mammary gland from the pectoralis major muscle to its cranial, medial, and lateral limits.

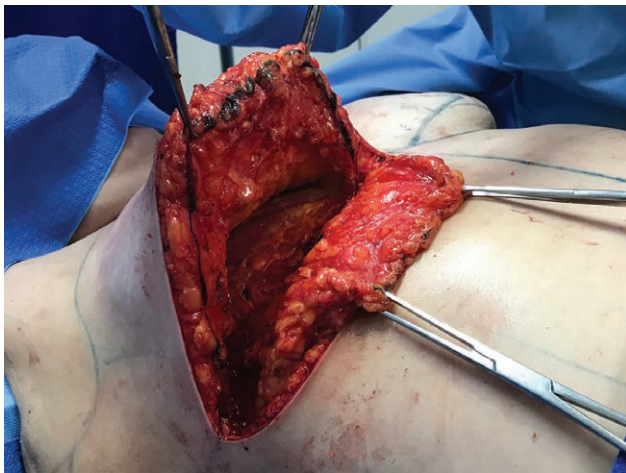
The breast parenchyma was uniformly resected, preserving a residual thickness of 1.5–2 cm throughout the breast, with the cleavage plane preserving glandular tissue in a minimum thickness for better synthesis of the pillars (Fig. 2). In the secondary surgeries, in patients who had previous breast implants, capsulectomy was performed for greater expansion of the pectoralis major muscle, with preservation of 1 cm band at the caudal limit of this muscle for consistency in the synthesis with the inferior

protection flap. After this step, bimanual palpation to feel the uniformity of the residual skin coverage, as well as to compare it with the contralateral side, was performed (Fig. 3). Maintaining a minimum safety thickness, the superior pedicle areolar flap was made, releasing the areola from the medial and lateral pillars around 6 cm cranially to points B and C.<sup>7</sup>

The pectoralis major muscle was sectioned caudally, with the creation of a subpectoral pocket, laterally in the subfascial plane of the anterior serratus muscle. Pectoralis major muscle was disinserted at the distalmost part of the sternum, from deep to superficial plane, to keep it adhered to subcutaneous cell tissue.<sup>8</sup>

A protective flap with a thin inferior pedicle, preserving the superficial layer of the superficial fascia and removing skin and subcutaneous tissue, was made, irrespective of the size of donor area (Fig. 4).<sup>9</sup> Flap viability, characterized by the bleeding in its apex, was observed.

The prosthesis was placed below the pectoralis major muscle and the inferior fascial flap. The fascial flap was sutured to the pectoralis major muscle, fully or partially



**Fig. 2.** Demarcated area for resection of the breast parenchyma, parallel to the skin.



**Fig. 3.** Checking of the thickness of the skin cover.

covering the prosthesis (Fig. 5). The excess tissue in the inferior flap was resected.

The pillars were brought together and sutured, without any “assembly” of the glandular remnant. The dermoglandular flaps were pulled caudally, covering the breast content, towards the mammary groove. The surgical wound in the mammary fold (fascia, subdermal, and intradermal) was sutured in layers, with suction drain from the supramuscular pocket.

The new areola site was marked, de-epithelialized and sutured, thus establishing the final point A. All measures were checked for symmetry between the breasts, according to Figures 6 and 7. Refinements, such as liposuction or complementary fat grafting, were made.

In all patients, a suction drain was used, which was removed on the first postoperative follow-up. The patients were discharged within 24 hours. The use of a surgical bra was indicated for 2–3 months.

### Postoperative Care

Weekly outpatient follow-up was performed for the first 15 days, monthly follow-up until 6 months, and thereafter every 6 months. All cases were followed up for a period of 12–30 months. At 6 and 12 months, the patients were asked about the degree of satisfaction in relation to the surgery outcome, and were asked to give an opinion on whether they were dissatisfied, satisfied, or very satisfied.<sup>10</sup> Data such as age, the amount of silicone prosthesis employed, average weight of resected breast tissue of each breast, type of surgery (primary or secondary), duration of the surgery, and adverse events were collected from medical records.

## RESULTS

The average age of the operated patients was 42 years, ranging from 22 to 60 years. Out of the 100 operated patients, 68 were primary surgeries and 32 secondary surgeries, and previous breast surgeries were reduction mammoplasty, augmentation mammoplasty and mastopexy associated with subglandular implants.

The most used volume of round prostheses was 325 mL, with a range from 275 to 500 mL. The average weight of the resected breast tissue of each breast was 340 g, with a minimum of 150 and a maximum of 620 g.

The average duration of the surgery was 5 hours, varying from 4 to 6 hours. Adverse events were considered minor and are listed in Table 1. No encapsulation was diagnosed throughout the follow-up period.

At 6 months postoperatively, 86% of patients reported being very satisfied, 13% satisfied, 1% dissatisfied with the result of the procedure. The satisfaction rate was maintained after 12 months. Figures 8–10 show the preoperative condition of some patients undergoing structured mammoplasty, as well as the surgery outcomes after 6–9 months of follow-up.

## DISCUSSION

Traditionally, for large and heavy breasts, the option is for simple breast reduction, which presents a rapid

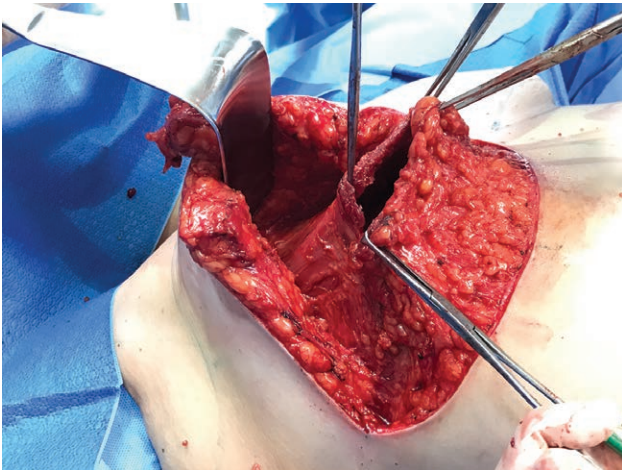
and inevitable evolution to the natural shape, without the desired “marked” cleavage. For flaccid breasts and breast ptosis, the most used technique is still mastopexy with prostheses, usually in the subglandular plane. In these surgeries, small or moderate prostheses are usually chosen to not increase the weight of the breasts and the recurrence of ptosis, with a consequent loss of the upper pole projection.<sup>10-12</sup> However, with such an approach, the dissatisfaction rate in the medium and long term is high, raising questions about the best surgical approach to be adopted.<sup>13,14</sup>

As an alternative to these approaches, the structured mammoplasty technique described in this work, in which breast reduction and mastopexy with silicone implants are performed, allowed for obtaining more predictable, long-lasting results with a higher degree of patient satisfaction. The objective of this technique is to convert hypertrophic and/or ptotic breasts into

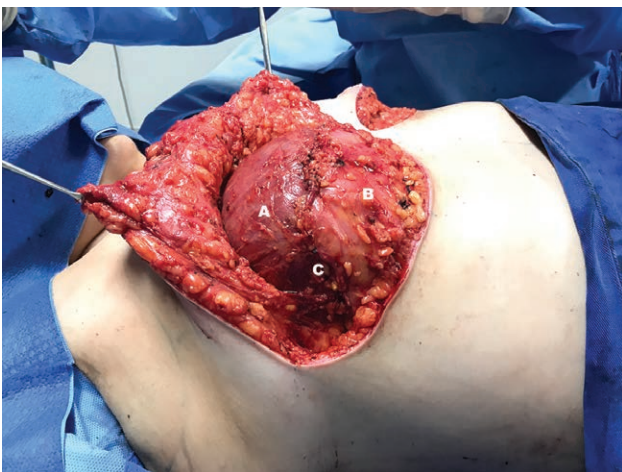
conical and symmetrical breasts, with convexity of the upper pole. For this, it is important that there is a balance between the content and the mammary continent (skin envelope).

It is believed that if the patient’s desire is for natural or “drop” breasts, the best option is still the technique without alloplastic material. However, when the desire is to have rounded breasts with a projected upper pole, the technique described here is a reliable option. For long-lasting results, some precepts must be obeyed.

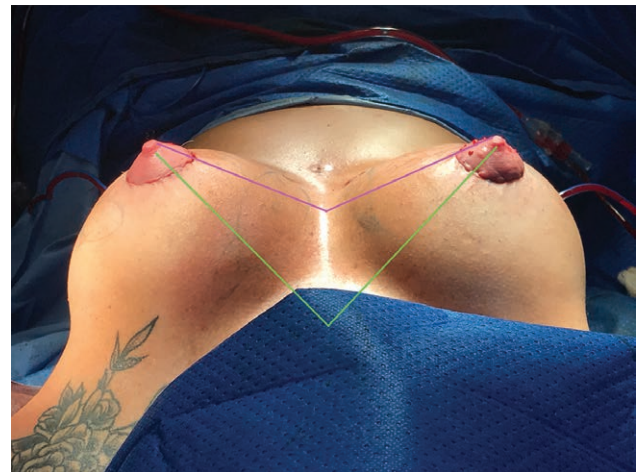
The first one is to keep glandular tissue to a minimum, preventing it from descending in front of the breast prosthesis,<sup>15</sup> a deformity known as a “waterfall effect.” Just as important is that this thin glandular layer is uniform over the entire coverage of the breast implant, so that the final shape of the breast is mainly the prosthetic component. Thus, there should be no “assembly” of the glandular tissue remaining before the prosthesis, and the pedicle of



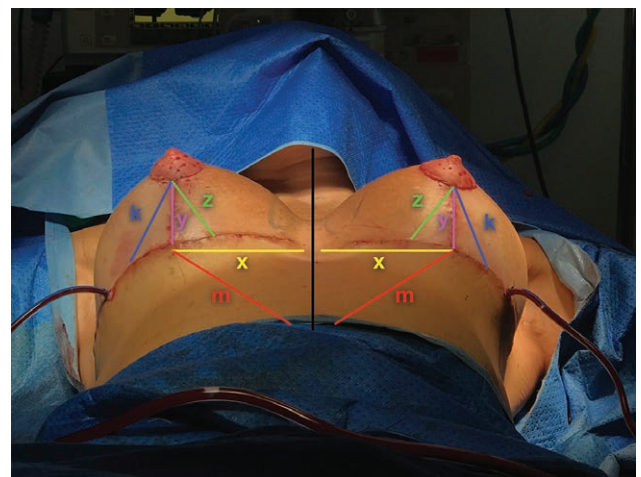
**Fig. 4.** Making of the protection flap with lower pedicle.



**Fig. 5.** Illustrative photograph of the implant pocket: A, pectoralis major muscle; B, protection flap; C, fascia of the anterior serratus muscle.



**Fig. 6.** Checking of the symmetric topography of the nipple-areolar complexes.



**Fig. 7.** Metric checking for symmetry: m: positioning of the mammary fold; x: distance between the caudal union of the pillars and the mammary fold and the midline of the chest; relationship between y, z, k lines ( $z = y + 0.5\text{ cm}$ ;  $k = z + 1\text{ cm}$ ).

**Table 1. Complications Encountered in Relation to the Total Number of Operated Breasts and Additional Treatment Performed**

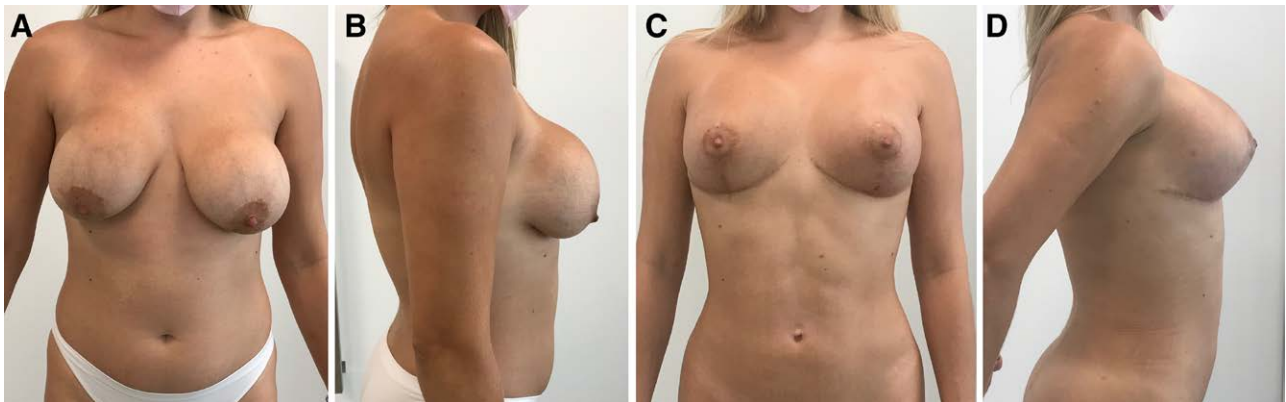
Complication	N (%)	Additional Treatment
Areolas with epidermolysis and partial necrosis	4 (2)	Conservative treatment and subsequent tattooing for pigmentation
Additional skin surplus in the lower pole after 6 mo	6 (3)	New resection of lower pole skin, with no contacting the prosthesis
Hematoma	1 (0.5)	Surgical reopening
Snoopy nose deformity, attributed to the excess volume of the areolar pedicle.	2 (1)	No treatment

the nipple–areolar complex must be thin and uniformly distributed, which is best achieved with the areolar superior pedicle technique.<sup>16</sup>

In addition, the breast prosthesis, regardless of its size, must be stabilized within the described pocket (modified dual plane). This structuring of the implant pocket keeps the prosthesis closer to the chest, reducing the pendulum action. For structuring, anchoring the pectoralis major muscle to the safety inferior pedicle guarantees the nonretraction of this muscle, as well as the dynamic compression of the implant so that it always remains stretched, without folds or “rippling.”

For the final shape of the breast, the size of the prosthesis is a determining factor. Thus, the choice should

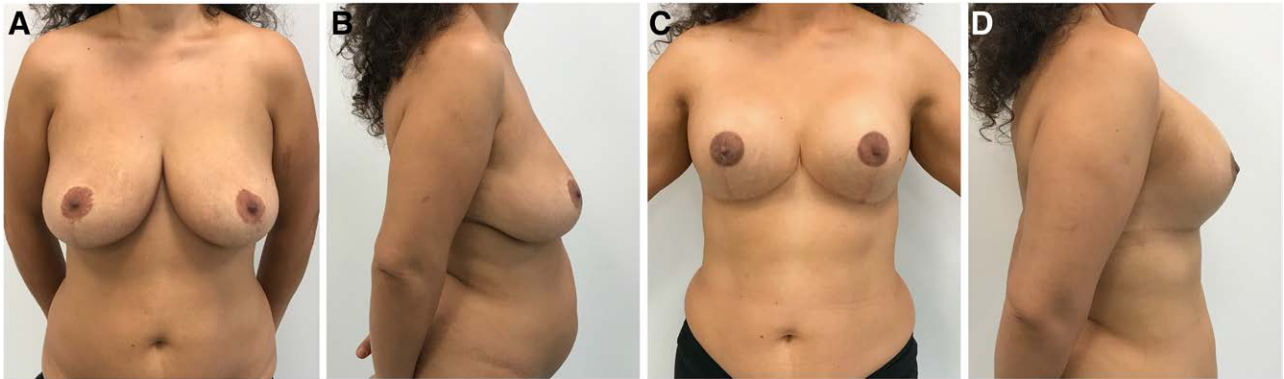
be based on the horizontal diameter of the breast as in a regular surgery to include silicone prostheses. Respecting the diameter of the prosthesis base will result in a craniocaudal length of the breast sufficient for projection of the upper pole. It is also important to observe the thickness of the subcutaneous cellular tissue around the breasts. Thus, in thin patients, ideally, prostheses with moderate or high projection should be used, while in patients with thick adipose panicle, more projected prostheses (high or extra-high) should be used. The resection of the glandular tissue, leaving the skin coverage uniform and thin, allows the prostheses to be large in size, being chosen based on the chest anatomy and the desired breast projection.



**Fig. 8.** A 31-year-old patient with grade 3 ptosis with capsular contracture, 7 years after periareolar mammoplasty for tuberous breasts and pregnancy. Surgery: average resection of 185 grams per breast + removal of a 255 mL prosthesis + structured mammoplasty with a 405 mL prosthesis. A, B, Preoperative pictures. C, D, Six months postoperative.



**Fig. 9.** A 33-year-old patient, after bariatric surgery and with grade 3 ptosis. Surgery: mean resection of 265 g per breast + structured mammoplasty with 405 mL prosthesis. A, B, Preoperative pictures. C, D, Six months postoperative pictures.



**Fig. 10.** A 48-year-old patient with grade 1 ptosis and previous reduction mammoplasty. Surgery: average resection of 440 g per breast + structured mammoplasty with a 325 mL prosthesis. A, B, Preoperative pictures. C, D, Nine months postoperative pictures.

Another objective of the technique is the assurance of implant protection in the areas of union scars, preventing dehiscence, exposure, and, consequently, contamination. This is achieved with the so-called lower protection flap. Thus, it is believed that there is a benefit in decreasing infection and future capsular contracture.<sup>17</sup> We observed that this flap has high tensile strength and great vascular safety, even in cases with scars on the previous mammary fold (neovascularization).

It is worth mentioning that, in the secondary surgeries, the inferior flaps were viable even in the presence of previous scars in the mammary groove. Moreover, there was no case of nipple–areolar complex necrosis. In comparison with the primary surgeries, healing was faster and of better quality, which may be due to previous cutaneous flap healing and delay phenomenon.

The precise resection of the skin, achieved with symmetrical guide markings during the planning of the surgery (as previously described), is essential to be able to accurately house the nipple–areolar complex at the mammary apex, as well as the breast rounding, always aiming that the latero-lateral diameter is similar to the cranio-caudal one. The stabilization of the breast content ensures that the shape of the breast and areola is not distorted. Another benefit of a well-located stable prosthesis is that any cutaneous leftovers, observed in the postoperative period, can be corrected without violating the breast implant pocket. The same applies to excess tissue posterior to the nipple–areolar complex, usually of the areola pedicle, which may be in excess. Another important factor is the uniform distribution of skin tensions, which ensures that the scars are uniform and thin.

Although capsular contracture is the leading complication after breast implant surgery, with reported prevalence between 5% and 19% after augmentation,<sup>18</sup> no patient had this complication in the present study. Capsular contracture is a multifactorial condition consisting of both immunobiological factors (ie, immunological and bacterial factors) and of patient-, surgery-, and implant-specific risk factors.<sup>18</sup> There is strong (presumptive) evidence that the following factors increase these risks: longer duration of follow-up, breast reconstructive surgery in patients with a history of breast

cancer, subglandular implant placement, postoperative hematoma, and a smooth implant surface.<sup>19</sup> Therefore, considering that we did not include in the present study any breast reconstruction patient, employed the subpectoral placement of microtextured implants, and had only one case of postoperative hematoma, which was surgically reopened, these factors may have contributed to our successful outcomes.

It is worth mentioning that, based on the most extensive data, the microtextured Siltex implants exhibit a rare risk of BIA-ALCL (0.0012%). However, relative to smooth implants, Siltex devices provide risk-reduction benefits for the most common reason of reoperation in patients who underwent primary augmentation (capsular contracture) or primary reconstruction (asymmetry). Therefore, all our patients received detailed risk-benefit information and agreed with the implantation of Siltex devices.<sup>20</sup>

## CONCLUSIONS

The technique called structured mammoplasty proved to be safe and predictable in terms of results, bringing lasting satisfaction. In addition, it is extremely versatile because it can be applied to different types of breasts (hypertrophic, tuberous, ptotic, asymmetric, flaccid).

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## REFERENCES

1. Qureshi AA, Myckatyn TM, Tenenbaum MM. Mastopexy and mastopexy-augmentation. *Aesthet Surg J*. 2018;38:374–384.
2. Spear SL, Pelletiere CV, Menon N. One-stage augmentation combined with mastopexy: aesthetic results and patient satisfaction. *Aesthet Plast Surg*. 2004;28:259–267.
3. Spring MA, Hartmann EC, Stevens WG. Strategies and challenges in simultaneous augmentation mastopexy. *Clin Plast Surg*. 2015;42:505–518.
4. Swanson E. Ideal breast shape: women prefer convexity and upper pole fullness. *Plast Reconstr Surg*. 2015;135:641e–643e.
5. Wise RJ. Treatment of breast hypertrophy. *Clin Plast Surg*. 1976;3:289–300.

6. Schwarzman E, Goldan S, Wilflingseder P. The classic reprint. die technik der mammoplastik (the technique of mammoplasty). *Plast Reconstr Surg*. 1977;59:107–112.
7. Klinger M, Klinger F, Maione L, et al. Superior pedicle breast reduction with prefiguration of final shape: a 10-year retrospective study. *Plast Reconstr Surg Glob Open*. 2020;8:e3242.
8. Tebbetts JB. Dual plane breast augmentation: optimizing implant-soft-tissue relationships in a wide range of breast types. *Plast Reconstr Surg*. 2006;118:81S–98S.
9. Mansur JR, Bozola AR. Mastopexia e aumento das mamas com proteção e suporte inferior da prótese com retalho de pedículo inferior. *Rev Bras Cir Plást*. 2009;24:304–309.
10. Guimarães LA, Guimarães RA. Reduction mammoplasty with the use of breast implants. *Rev Bras Cir Plást*. 2015;30:544–551.
11. Beale EW, Ramanadham S, Harrison B, et al. Achieving predictability in augmentation mastopexy. *Plast Reconstr Surg*. 2014;133:284e–292e.
12. Xue AS, Dayan E, Rohrich RJ. Achieving predictability in augmentation mastopexy: An update. *Plast Reconstr Surg Glob Open*. 2020;8:e2784.
13. Calobrace MB, Herdt DR, Cothron KJ. Simultaneous augmentation/mastopexy: a retrospective 5-year review of 332 consecutive cases. *Plast Reconstr Surg*. 2013;131:145–156.
14. Manero I, Rodriguez-Vega A, Labanca T. Combined breast reduction augmentation. *Aesthetic Plast Surg*. 2019;43:571–581.
15. Ricci JA, Driscoll DN. Removing the ambiguity from the double bubble. *Plast Reconstr Surg*. 2015;136:864e–865e.
16. Adorno Filho ET, Almeida KG, Arruda AM, et al. Breast reduction with the lower pedicle technique: an observational study. *Rev Bras Cir Plást*. 2014;29:525–530.
17. Ricbourg B. [Applied anatomy of the breast: blood supply and innervation]. *Ann Chir Plast Esthet*. 1992;37:603–620.
18. Bachour Y. Capsular contracture in breast implant surgery: where are we now and where are we going? *Aesthetic Plast Surg*. 2021;45:1328–1337.
19. Bachour Y, Bargon CA, de Blok CJM, et al. Risk factors for developing capsular contracture in women after breast implant surgery: a systematic review of the literature. *J Plast Reconstr Aesthet Surg*. 2018;71:e29–e48.
20. Wixtrom RN, Garadi V, Leopold J, et al. Corrigendum to: Device-specific findings of imprinted-texture breast implants: characteristics, risks, and benefits. *Aesthet Surg J*. 2021;41:859.