

Breast reduction with implants: case series, operative technique and long-term results

Reducción mamaria con implantes: serie de casos, técnica operatoria y resultados a largo plazo

Eduardo Santos-Cañamar¹, Cynthia M. González-Cantú², Ignacio Fuentes-Galindo¹, Eduardo de la Garza-Santos¹, and Yanko Castro-Govea^{2*}

¹Práctica privada; ²Servicio de Cirugía Plástica, Estética y Reconstructiva, Facultad de Medicina y Hospital Universitario Dr. José Eleuterio González, Universidad Autónoma de Nuevo León. Monterrey, Nuevo León, México

Abstract

Background: Breast reduction techniques have been considered functional procedures proposed to reduce the volume and elevate the position of the nipple-areola complex. Traditionally these techniques were performed as mostly functional procedures. The main reasons for dissatisfaction after a reduction technique are breasts with a deflated appearance due to alteration of the shape, particularly of the upper pole, and simultaneously, the high frequency in the appearance of pseudoptosis in the medium and long term. All this contributes to the patients' desire for secondary surgeries or refinements. **Objective:** We know that currently the demands and expectations of our patients are increasing, and they specifically request a better aesthetic outcome. **Method:** We present our experience and surgical approach to breast reduction, using a superior base flap in combination with implants. **Results:** We believe that the results are more stable in the long term and with low complication rates. **Conclusions:** According to what has been reported in the literature, our casuistry represents the most extensive to date.

Keywords: Breast. Breast implants. Reduction mammoplasty. Gigantomastia. Breast hypertrophy.

Resumen

Antecedentes: Las técnicas de reducción mamaria se han considerado procedimientos funcionales propuestos para reducir el volumen y elevar la posición del complejo areola-pezones. Tradicionalmente fueron realizadas como procedimientos mayormente funcionales. Las principales razones de insatisfacción posterior a una técnica de reducción son senos con aspecto desinflado por alteración de la forma, en particular del polo superior, y simultáneamente la elevada frecuencia en la aparición de pseudoptosis a mediano y largo plazo. Todo ello contribuye al deseo por parte de las pacientes de cirugías secundarias o refinamientos. **Objetivo:** Tenemos claro que actualmente las exigencias y las expectativas de nuestras pacientes son cada vez mayores, y por supuesto específicamente radica en un mejor refinamiento estético. **Método:** Presentamos nuestra experiencia y enfoque quirúrgico de reducción mamaria utilizando un colgajo de base superior en combinación con implantes. **Resultados:** Creemos que los resultados son más estables a largo plazo y con bajas tasas de complicaciones. **Conclusiones:** De acuerdo con lo reportado en la literatura, nuestra casuística representa la más extensa hasta el momento.

Palabras clave: Mama. Implantes mamarios. Mamoplastia de reducción. Gigantomastia. Hipertrofia mamaria.

*Correspondence:

Yanko Castro-Govea

E-mail: goveayanko@hotmail.com

Date of reception: 01-03-2021

Date of acceptance: 08-08-2021

DOI: 10.24875/CIRUE.M21000579

Cir Cir (Eng). 2022;90(6):807-814

Contents available at PubMed

www.cirugiaycirujanos.com

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Introduction

Historically, breast reduction techniques have been considered functional procedures to reduce breast volume and raise the position of the nipple-areolar complex¹. However, when the main objective is only volume reduction, certain proportion of patients experiment unsatisfactory results in the middle and long term, particularly with the appearance of the upper pole of the breast, and due to the high frequency in the development of pseudoptosis². Throughout the dynamic evolution in the treatment of functional breast reduction, several techniques have been developed to simultaneously provide a benefit in the integral shape of the breast; however, when these techniques combine the use of implants, an additional benefit is obtained, not only in the shape and projection, but also in the consistency^{3,4}.

Reports in the literature in favor of the use of breast implants combined with conventional and innovative procedures for breast reductions are flattering^{5,6}. This combination leads to good results, with low complication rates, similar recovery times, and great satisfaction compared to breast reduction as the only procedure^{7,8}.

It is essential to identify in advance the anatomical characteristics that make a breast reduction procedure and the use of implants desirable: patients in different degrees of breast tissue flaccidity in which skin quality has great relevance, patients that require larger resections of breast tissues, and undoubtedly, those who also seek a significant improvement in appearance and consistency of their breast with breast reduction. It can also be performed in cases of moderate to severe breast asymmetry⁹, and patients who had a previous breast reduction with or without mastopexy, and who have developed pseudoptosis¹⁰. Ideally, patients with gigantomastia, smokers, or with very large pedicles where the viability of the flap is at risk are not considered as candidates¹¹.

We primarily establish our surgical approach starting from a common denominator of all patients who are candidates for breast reduction: the larger the breast volume, the greater the ptosis, and therefore, at the time of performing the breast reduction, we resected the larger amount of tissue, and in this way, we turned a hypertrophic breast into a smaller. Then, we used a flap of upper pedicle to provide adequate vascularization, and on this base we prevent breast tissue from sagging in the future, as this is one of the main problems described for other surgical techniques¹².

Lastly, with the combination of a customized implant for each patients, we compensated for three important variables: better balance of the volume between the upper and lower pole, an integral appearance with higher aesthetic standards, and undoubtedly enhanced projection, consistency, and firmness of the breasts. We believe that these variables can contribute to higher patient satisfaction.

In this paper, we show our experience in breast reduction using an upper pedicle flat combined with breast implants. We believe that this strategy yields results that are more predictable in the middle and long term, as well as low complication rates.

Method

A retrospective analysis was performed focused on candidates to breast reduction in one single phase in conjunction with implants. All procedures were performed by the same surgeon. It included patients for a period of 12 years, from January 2007 to December 2019.

The inclusion criteria were patients over the age of 18, candidates for breast implant surgery according to the characteristics mentioned above. The exclusion criteria included gigantomastia and severe breast hypertrophy. Smoking was not considered an exclusion factor in this study and patients were asked to abstain from smoking 12 week before and after the procedure.

The study variables included age, resected gland volume, implant volume, duration of surgery, type of follow-up, and complications related to breast reduction. Finally, the degree of patient satisfaction was also assessed with the Likert scale¹³.

Surgical technique

MARKING

In all case, before the procedure, both breasts were marked while the patient was standing. The following lines and dots are marked: the deepest part of the sternal low neckline, breast meridian (line intersecting with the medioclavicular line, the nipple and the inframammary fold), and the inframammary fold.

The new position proposed for the nipples was performed based on the height of the inframammary fold, and this fold was marked on the anterior surface of the breast. The vertical pattern was marked by holding the skin tissue with both hands (thumb and index) and pulling the medial and lateral tissue toward the nipple

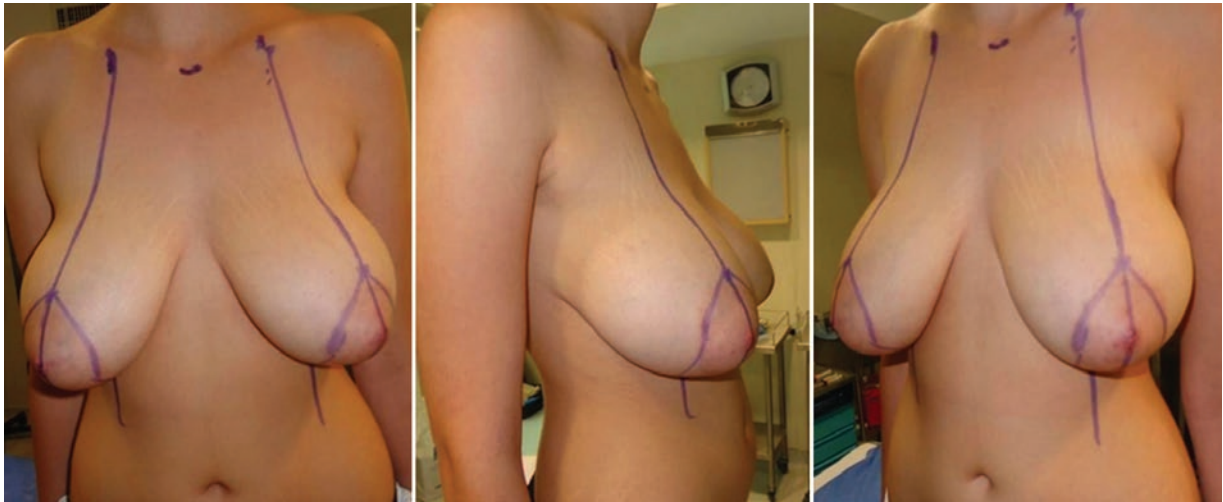


Figure 1. Preoperative, anterior, lateral, and oblique view. Preoperative marking showing transposition of the inframammary fold that connects to the breast meridian in order to set the new location of the areola-nipple complex. The vertical pattern is marked.

in order to calculate the inner and outer edges of the breast. Primarily, the nipple was placed 1 cm above the inframammary fold on the intersection of the previously marked middle line (Fig. 1). This maneuver did not involve the Wise pattern (keyhole).

During the visit before the procedure, the measurements estimated an approximate implant size, and during the procedure, the final position of the nipple-areolar complex was compared against the marking again. The definitive size of the implant was determined during the surgery using measuring devices under strict sterilization protocol.

SURGICAL PROCEDURE

All procedures were outpatient procedures performed in a surgery center, using intravenous sedation and local anesthetic. Each breast was injected with 100 ml of lidocaine at 0.5% with an epinephrine solution (1:200,000). All patients were subject to a vertical breast reduction, using an upper base pedicle.

PRIMARY REDUCTION

A pattern (areola marker) of 40 mm to mark the new diameter of the areola, and then, de-epithelializing the entire marked complex.

TISSUE RESECTION AND PLACEMENT OF THE MEASURING DEVICE

The lower middle segments of skin and fatty glandular tissue segments were removed. In all cases, the primary concern was to ensure that the medial and lateral dermoglandular flap had a thickness 2 cm. The resection of the glandular tissue was performed with a scalpel, and the dissection with scissors, minimizing the use of electrocautery as much as possible.

Once the major pectoral muscle is identified, the inferolateral portion was cut open, creating a submuscular pocket. The aponeurosis of the muscle was preserved and raised to the level of the inframammary fold, and its medial insertions were released, leaving a stump of 2cm of the costal plane. Next, an implant measuring device was placed to decide the definitive size of the implant. The protocol included raising the backrest of the surgical table approximately 45°, which allowed a careful visual assessment from different angles. This maneuver was considered a key test in order to obtain better symmetry and shape of the breasts, and logically, it was also performed once the definitive implants were placed.

We preserved the aponeurosis of the major pectoral muscle so that, once the definitive implant is placed, it can be adequately covered, as in this way, displacement and exposure are prevented (Fig. 2).

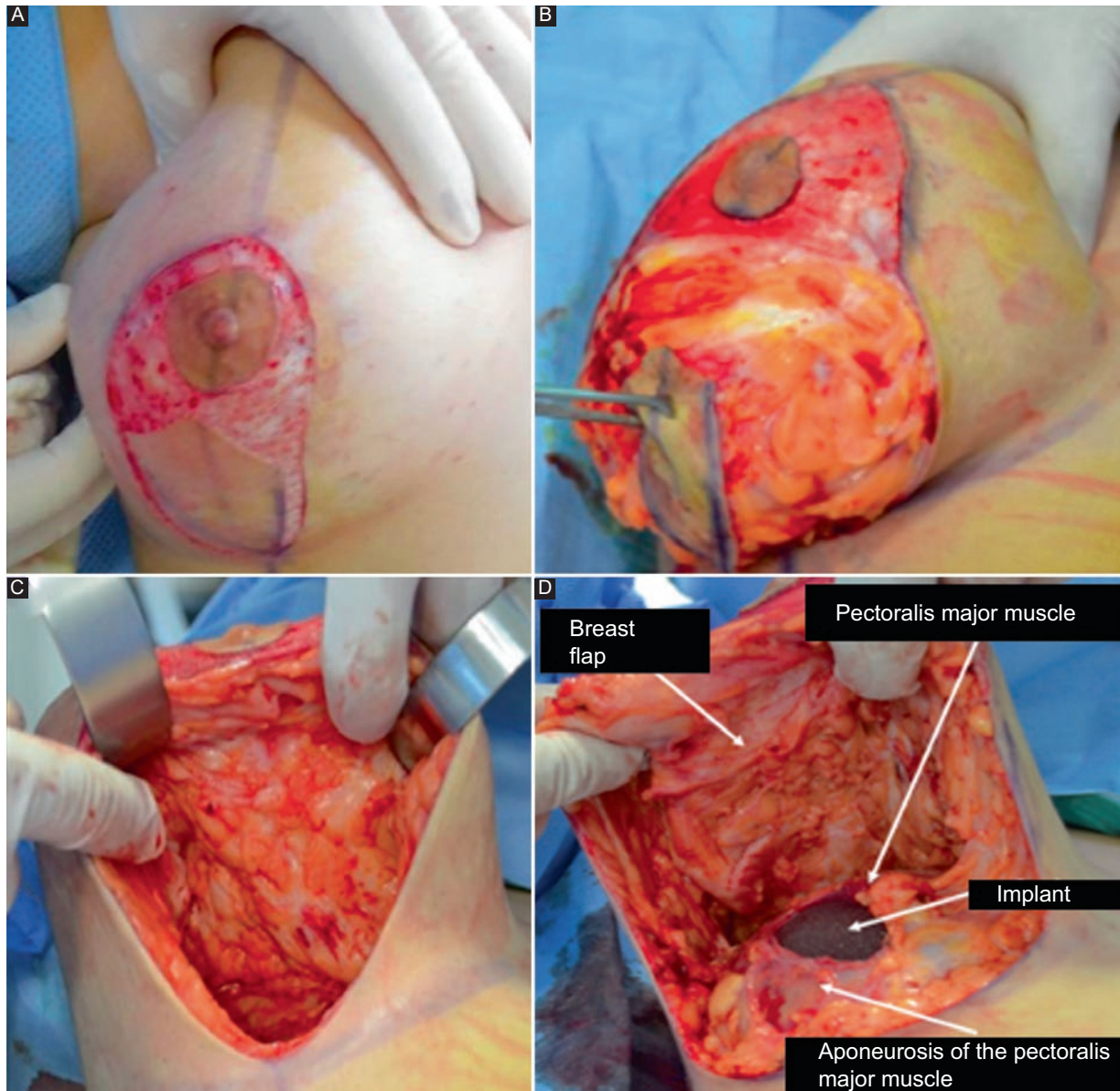


Figure 2. Transoperative view. **A:** de-epithelialized periareolar incision and vertical approach. **B:** skin and fatty-granular tissue of the lower pole. **C:** resection of the lower and deep part of the gland preserving a medial and lateral dermoglandular flap of 2 cm of thickness. **D:** view of implant placement in the submuscular plane and aponeurosis of the rectus abdominis.

SECONDARY MASTOPEXY

The new location of the areola and nipple was determined using the close design method, and the new areolar opening was marked with a 38 mm pattern. Once the new areola has been de-epithelialized, its upper pole, mainly, was located 2 cm above the previously estimated location of the nipple (matching the intersection of the medioclavicular line, the nipple, and the inframammary fold). According to the characteristics of each patient, an average distance of 5 to 7 cm

from the lower areola pole to the inframammary fold was marked. In cases of higher vertical excess, an inverted T closure was performed; logically, the corresponding location of the arm horizontally to the inframammary fold was ensured (Fig. 3).

PLACEMENT OF THE DEFINITIVE IMPLANT

After performing any additional resection, the implant measuring device was removed, and then, the

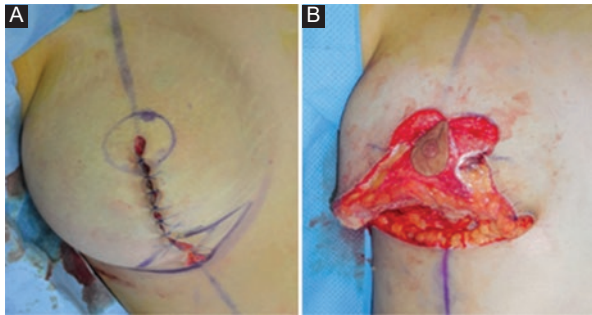


Figure 3. *Transoperative view. A: the site of the areola-nipple is determined with the closed design method, and the new areolar opening is marked with an areolar pattern of 38 mm. A inverted T modification is used. In this step, the author determines the adequate size of the implant. B: after the resection of the marked skin and the approach to the breast pillars, the horizontal and vertical incisions.*

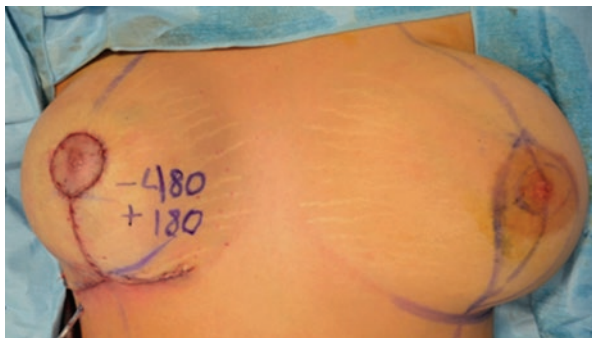


Figure 4. *Transoperative view of the final result of the right breast with a resection of 480 g and silicone implant of 180 g placed in a submuscular plane.*

hemostasis was carefully verified, and the space was irrigated, before the placement of the implant, with an antibiotic kanamycin solution (1g in 1000ml of physiological saline solution). We do not use any other solutions, such as povidone-iodine.

Finally, the definitive implant was placed at the submuscular level employing a minimal contact technique (the implant is only handled by the head surgeon before changing gloves cleaned with the same antibiotic solution). The lower part of the implant was covered with the previously raised part of the fascia of the upper rectum, which is in a biplanar position.

CLOSURE

Once the new nipple-aerolar complex is revealed, two or three key sutures are placed in order to close and provide symmetry to the vertical pillars, and then, the

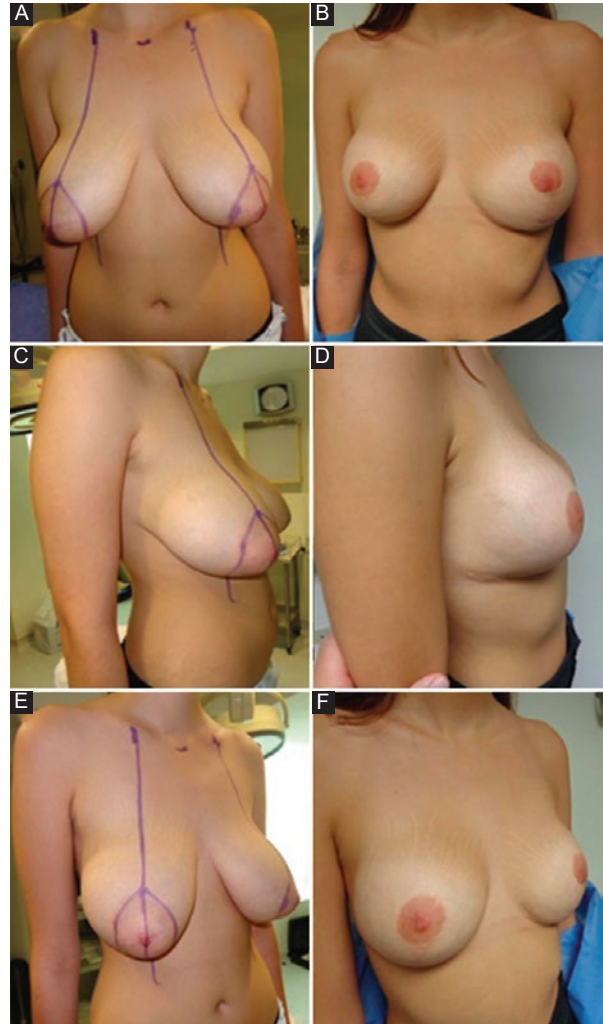


Figure 5. *A-E: preoperative views of a 20-year-old patient with breast hypertrophy and third degree ptosis. B-F: postoperative views 4 years after breast reduction surgery with a resection weight of 480 g for both breasts, with round silicone implants of 180 g in a submuscular plane.*

periareolar incisions are closed in two planes and the horizontal and vertical arms are closed in three layers; in this way, tissue tension is prevented as much as possible (Fig. 4). In all cases, a small drain was placed (Drenovac®, Neodren), fixed with a nylon suture 4-0.

Results

A total of 180 patients were subject to breast reduction using an upper base flap in conjunction with implants. The degree of patient satisfaction was categorized with a Likert scales in the following categories: very good, good, fair, poor, and very poor. The results were very good in 81%, good in 11%, fair in 7%, poor in 1%, and very poor in 0%. The average age of the patients was

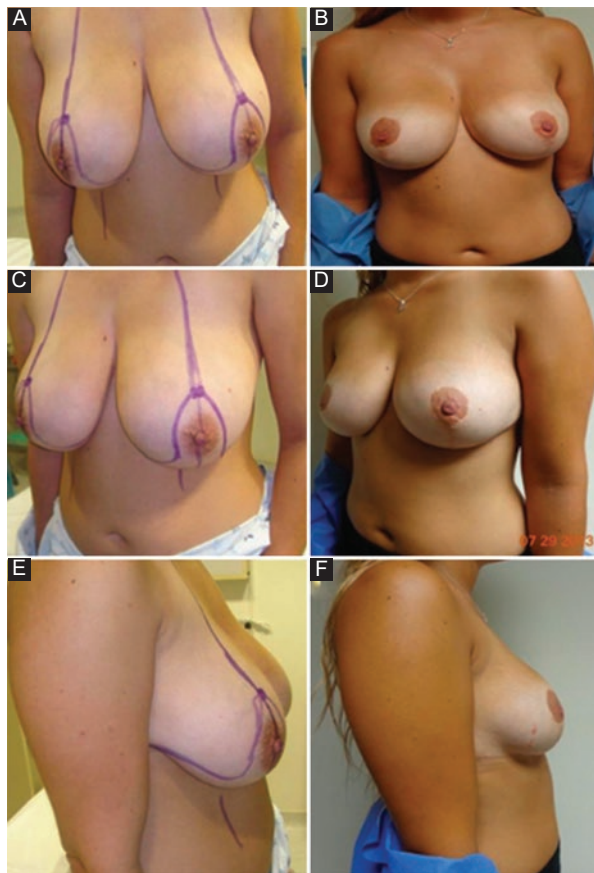


Figure 6. A-E: preoperative views of a 23-year-old patient with breast hypertrophy and third degree ptosis. B-F: postoperative views 3 years after breast reduction surgery with a resection weight of 477 g for the right breast, and 554 g for the left breast, with round silicone implants of 180 g in a submuscular plane.

35 years. The results were photographically documented and the follow-up range for the patients was between 3 months and 5 years, with a mean time of 19.7 months (Fig. 5 and 6). The weight range of the breast resection was between 120 and 783 g, with a mean weight of 323 g for the right breast, and 353 g for the left breast. The range of volume for the implants was between 145 and 280 cc, with a mean of 180 cc. All breast implants were high-profile and round, and were placed in a submuscular plane. Mean surgical time was 2 hours. The mean drainage removal time was the third day after surgery, primarily with amounts lower than 5 ml per day.

The global rate of complications was 15% (27 patients). The most common complication was delayed scarring of the wound in 18 patients (10%). Among them, four cases here hematomas (evacuated in the operating room) and five were minor infections that resolved with oral antibiotics.

There were no cases of flap loss, ischemia, or nipple necrosis. There were no seromas and no patient returned requesting the removal of the breast implants. Surprisingly, no complications related to the breast implants were evidenced, although their identification was not one of the primary objectives of the study.

Discussion

Multiple surgical breast reduction techniques have been described until now, with the primary objective of reducing the volume or weight of the breasts in order to improve their position, shape and configuration. Each of these techniques has advantages and disadvantages. The main advantages are satisfaction, comfort during physical activity, and a significant decrease in neck, shoulder, and back pain by reducing weight support, as well as an increase in self-esteem in patients¹⁴. However, one of the disadvantages of reduction techniques in general is that they do not significantly improve the projection of the breast or the upper pole.

In this sense, the main complaint expressed by patients who undergo this procedure is the final appearance of the breast, as breast tissue appears deflated or flat, which may be associated with a technical surgical deficiency or factors such as weight loss, aging, pregnancy, or breastfeeding, and it eventually leads to patients desiring a more attractive appearance of their breasts^{15,16}.

The combination of breast reductions and implants still is a controversial topic in some ways. However, it has been described that the replacement of the breast parenchyma associated with the placement of breast implants provides firmer and more projected breasts¹⁷. Recently, studies have been published on breast reduction techniques and the use of implants with good results and low complication rates¹⁸.

The purpose of our technical approach is to turn large breasts into the smallest size possible, and then, replace the fatty-glandular tissue with a customized breast implant providing greater stability and directly contributing to enhanced symmetry, shape, and projection of the breasts.

After the extraction of breast tissue, in contrast with other authors who insert the implants in a retroglandular plane^{19,20}, we prefer to place them in a submuscular manner and we include an aponeurotic cover in the lower pole. We believe this maneuver offers greater stability, as it provides better coverage of the implant, and prevents the possibility of displacement or exposure of the implant. We prefer to use a implant measuring device to decide their definitive size during surgery, and of

course, we take into account the wishes of the patients, and in this way we obtain better appearance of the breasts. We believe that, when removing the larger amount possible of breast tissue (without risking blood flow of the flaps), and placing the implant in a submuscular plane using the aponeurosis of the rectus abdominis in order to cover the lower pole, we prevent breast tissue from descending in the future, as the weight supported by the breast will be lower, and better results will be achieved in the long term.

In this study of 180 patients we used a vertical breast reduction and an upper base pedicle, becoming the series with the larger number of reported cases, followed by Chasan's²¹ with 35 cases.

The mean weight of the resection was 323 g for the right breast and 353 g for the left breast, and the mean weight of the breast implant was 180 g; this could be considered a moderate breast reduction. However, Thoma et al.²² described in their study that relatively small breast reductions (< 400 g per breast) often alleviate symptoms, and the resection weight is not significantly related to an improvement in the quality of life; in addition, it concluded that, not only the size, but also an unfavorable tissue distribution, can contribute to the symptoms.

The comparison of short-term and long-term results was made with photos by two surgeons outside of the study in follow up visits.

In this study, the global rate of complications was 15% (27 patients). According to literature reports, complication rates vary between 6.5% and 22%. Swanson²³ published his experience with breast reduction compared to breast reduction plus implants without finding any significant differences in the rate of complications between both groups. His general complications report was 50%, but, if aesthetic issues are not included, the rate of complications is reduced to half. Similarly to our complications, the most common in his group was the delay in wound scarring in 20%. In our experience, with breast reduction without implants there were no few significant differences in the rate of complications either. Our most common complication was delayed scarring of the wound in 10 (18 patients).

Saldanha et al.²⁴, report a review rate of 17.8% (47 patients), with rate of complications of 9.8% (26 patients). Among them, the most frequent ones were seromas, in 4.9% (13 patients), and dehiscence, in 1.8% (5 patients).

We consider that the use of a scalpel and scissors to perform the dissection may be a variable that explains our low rate of complications of the wound, and similarly, the

lack of formation of seroma, together with the placements of drainage. It has been reported that the tissue effects of electrocautery are a well known risk factor for the formation of seromas²⁵⁻²⁸. However, it is possible that few surgeons are willing to give up the comfort of hemostasis associated with dissection with electrocautery.

There are some descriptions of breast reductions based on auto-prosthesis techniques, but there have not shown long-term permanence results^{29,30}.

In regards to the appearance of the scar in patients who expressed it specifically, or that had a history of hypertrophic or hyperpigmented scars, a protocol of compression methods (silicone sheets) and laser therapy was established.

Conclusions

We believe that the main objective of breast reduction surgery is the removal of tissue to achieve a more desirable size, and simultaneously, in as much as possible, reorder the shape and appearance of the breasts. However, traditional techniques reduce volume, but shape and appearance are not completely satisfactory, and this is the cause for great dissatisfaction for patients, and it eventually leads to flaccidity and pseudoptosis of the breasts.

We believe that our surgical approach of breast reduction combined with implants reduces volume and obtains a higher aesthetic balance, which directly affects the shape, texture, and projection of breasts. The location of the implants in a submuscular plane, and their aponeurotic cover, together with the use of primarily small implants, largely prevents breast pseudoptosis.

Finally, we believe that this casuistry may support a safe and effective treatment option for women with large breasts who desire, in addition to volume reduction, fuller upper poles, better consistency, and projection. In all, an enhanced appearance with better aesthetic performance, without necessarily increasing the rate of complications, and significantly increasing self-esteem.

Funding

The authors declare that no funds were received from any public or private party, or any production sector, in order to carry out the study described in this article.

Conflicts of interest

The authors declare that there is no conflicts of interest.

Ethical disclosures

Protection of people and animals. The authors declare that no experiments were carried out on humans or animals for this research.

Data confidentiality. The authors declare that they have followed their center's protocols on the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

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